CEBMa
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Evidence-Based Management

Evidence-based Management Teaching Handbook

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"*Education is not the filling of a pot but the lighting of a fire*"
– W.B. Yeats

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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CEBMa Evidence-Based Management Teaching Handbook - Editors' Overview

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We Evidence-based Management (EBM) educators are passionate and hopeful. *Passionate* we are to help our students build their critical and reflective capabilities with the personal and career changes these create. *Hopeful* we are in our participation in the evidence-based practice movement spanning medicine, public policy, and management. All domains of evidence-based practice challenge uncritical acceptance of practices rooted in authority and tradition. EBM empowers people to combine their critical thinking with the best available evidence to make valueful and effective organizational decisions. As a community, we have joined forces in this book to share our learnings, positive and negative, with new or would-be EBM educators. We share both our insights and our contact information to invite you and particularly the new and EBM-curious educators into the EBM teaching community.

The assembled chapters offer an array of teaching approaches, exercises, and experiences shared by over a dozen educator/members of the Center for Evidence-Based Management (CEBMa). We have come together on-line and in face-to-face gatherings to learn from each other and articulate the knowledge and skills we think can help others to learn and practice EBM. As educators, some of us teach undergraduates and masters students, some executives, including DBAs (Doctorates in Business Administration), while still others conduct company workshops on EBM. Since the first EBM course was offered in 2007 at Carnegie Mellon, our focus has been on making actionable the basic premise of EBM, that *decision makers in organizations should make conscientious, explicit, and judicious use of the best available evidence from multiple sources.*

Our collective discussions have focused on the ways learners can acquire the skills and knowledge to act on EBM's basic framework (Figure 1). Educators worldwide have adapted and extended these frameworks—and should continue to do so! Our book shows how various educators worldwide have educated and supported their students to use the four sources of evidence relevant to organizational decisions: *scientific evidence, organizational data, stakeholder interests and concerns, and practitioner expertise* (the judgment of both the decision maker and other knowledgeable professionals).

Across all our EBM teaching you will observe two essential themes: learning how to identify and access the various kinds of evidence relevant to a decision or problem (*multiple sources)* and evaluating its validity and reliability (*trustworthiness*). In working to make these basic ideas understandable and actionable in the classroom, we came to recognize six central skills in EBM practice (known as the ***6 A's***). Much of our teaching targets these skills directly:

Ask—translating a problem or decision into an answerable question which evidence can inform

Acquire—systematically searching for and acquiring the evidence

Appraise—critically evaluating the trustworthiness and relevance of the evidence

Aggregate—weighing and pulling the evidence together

Apply—incorporating the evidence into the decision process

Assess—evaluating the outcome of the decision taken

As you read through this book, consider the learning goals you might foster in your EBM teaching. We observe an array of learning goals to mix and match depending on your audience and educational format (e.g., workshops, courses, or curricula):

- To be able to recognize and access the four sources of evidence that enhance organizational decision quality.
- To acquire the basic skills of EBM (the 6A's) in moving problem diagnosis to gathering and using evidence in making decisions and assessing outcomes.

Figure 1. EBM's Basic Framework

- To be able to evaluate the trustworthiness of the evidence for a given decision.
- To use appropriate evidence-based decision processes for type of decision and available information.
- To know how to develop logic models for complicated decisions to help the decision maker reflect on and combine relevant evidence.
- To identify ways to assess decision outcomes and effectiveness.
- To become a more reflective and critical decision maker.
- To develop a plan to deepen EBM skills and practice over time.

As you consider the learning goals your own teaching pursues, the *CEBMa Handbook* can be used along with materials created to support EBM educators: The textbook *Evidence-based management: How to use evidence to make better organizational decisions* (London: Kogan Page, 2018) by Eric Barends and Denise Rousseau and/or the PowerPoint decks openly available on the CEBMa website (https://cebma.org).

The Chapters

One theme runs through our teaching: Practice opportunities are essential for EBM participants. Active and repeated practice helps deepen understanding of EBM frameworks and their use in decision making and problem solving. This theme resonates through the array of undergraduate, masters, and executive level teaching we do. In our chapters, you will see common frameworks reinforced in an array of practice activities. These can be adapted to your audience and educational format.

The Basics of EBM Teaching

Our chapters are organized from the general to specific, beginning with overviews of the development of EBM education.

We lead off with ***Neil Walshe,*** a dynamic EBM educator, whose teaching sets the bar for the rest of us. Walshe shows the new EBM instructor the 7 key features he has used to build and deliver impactful EBM courses. His insights are invaluable to the educator who is the first to bring EBM to his or her academic setting. In effect, Walshe summarizes the do's and don'ts of EBM teaching.

Tina Saksida and R. Blake Jelley, early innovators in EBM teaching, reflect on their 15 years of EBM teaching. Their extensive experience with both undergraduates and executive masters students shows both the overlap and nuanced differences involved in bringing EBM principles to these distinct audiences. Saksida and Jelley highlight the various functional roles EBM courses can play in a curriculum, from introductions to management (undergraduates) to a reflective form of research methods training (executive masters).

Approaches to EBM Teaching for Specific Audiences

EBM education reaches a variety of audiences. Our authors show how the context shapes the teaching approaches they take.

The chapter by ***Claire Gubbins*** reflects on 10 years of teaching EBM and discusses strategies and methods used to integrate EBM to various post-experience Masters programmes and Executive MBA's. Practicing what she preaches, she provides some evidence on why and/or how the strategies are appropriate or effective. She includes content other EBM educators can use or adapt in teaching, assessment and evaluation. She identifies the key challenges encountered by students in developing their evidence-based practice skills.

Jeroen Stouten reports on KU Leuven's curriculum-wide approach to EBM teaching in its Work, Organizational, and Personnel Psychology bachelors and masters programs. Stouten describes the subject matter covered in EBM teaching at each level, and details various assignments used. Particularly helpful is the checklist Stouten developed for his students to guide them in identifying evidence sources and evaluating the trustworthiness of each.

Ruiling Guo, Lori Austill, Richard Ginnetti, and Liang Yang have substantial experience teaching healthcare management graduate students. Given the origins of the evidence-movement in evidence-based medicine during the 1990s, Guo and colleagues start by making the case for the natural connection between the two in healthcare management—and how their teaching reinforces this connection. They share their specific teaching methods and importantly practice what they preach, by conducting evaluations of student learning using pre/post assessments. Such assessment is exemplary teaching practice. These educators show us how.

Hannes Leroy, Moran Anisman-Razin, Pisitta Vongswasdi and Johannes Clayes provide insights into building evidence-based leadership development programs around EBM principles. Given diverse norms and expectations regarding leadership (NB. "The evils of snake oil are in no way mitigated by the customer's desire for it!"), their chapter addresses both the essential features of such programs as well as what to avoid in their positioning and development.

Robert "Doc" Waltz details his asynchronous on-line EBM course in a master's program on Organizational Leadership. While using EBM frameworks parallel to those used by the CEBMa community broadly, Waltz describes how to provide structure to students who need it and greater self-directedness for those who don't. His final assignment combines objectivity and storytelling to help build the competencies of students as leaders and decision makers.

Christian Criado-Perez shows how students can learn EBM-related principles in the context of developing a digital strategy. Organizational data are central to his course, calling attention to the identification of data needs, the acquisition and evaluation of data quality, and their application to problem solving. His chapter provides slides educators can adapt for their own uses.

Orla Feeney focuses on building foundational competencies for EBM, specifically critical thinking. Though many books are written on how to teach critical thinking, Feeney provides specific guidance for building the critical thinking competencies of first-year undergraduates as they prepare to undertaken university-level studies.

Ann Smith and Alessandra Capezio round off this section on teaching to specific audiences with their Capstone approach. Their Capstone module can be used to help influence minds and develop EBM skill sets in learners, helping them transition from students to practitioners. Their approach, adaptable to programs from undergraduate to graduate and executive doctorates, supports learners in engaging EBM principles and using multiple sources of evidence in solving real world problems.

Teaching Tools: Cases and On-Line-Training

The teaching tools EBM educators employ take many forms. This book provides cases and activities that work for us. We encourage you to adapt these to your own teaching needs—and experiment as we have done. We lead off with ***Jelley and Saksida*** sharing their use of cases and research proposals to provide practice opportunities. They also show how these teaching approaches can be adapted for different audiences. Importantly, you will see how they have continued to innovate over the 15+ years they have been teaching EBM.

Tatiana Andreeva describes short cases and assignments she developed to enable students to immediately apply formal EBM principles to practical settings. Andreeva shows how each case fits into the structure of her courses and the flow of student learning and assignments. She then describes the skill building assignments her students complete to learn to access different kinds of evidence for a practice question.

Denise Rousseau developed the Riparian case, with her change management students, and provides teaching notes for use at all university/college levels. The Riparian case helps learners identify the assumptions decision makers operate from in approaching a practical problem. These assumptions provide the basis for asking the class to consider what evidence might help evaluate a particular assumption. The notes give guidance for using Riparian to generate discussion on how the taken-for granted beliefs of decision makers can be evaluated for trustworthiness-- by acquiring evidence from different sources.

Eric Barends and Denise Rousseau provide the Eckford Sterling Corporate Banking case with teaching notes. This case helps students to recognize the assumptions managers often make in diagnosing organizational problems, and challenges students to identify trustworthy evidence that would enable a more judicious approach to problem solving. It also highlights that experience in different organizations can provide insight that people with more limited exposure may lack.

Eric Barends and Denise Rousseau present the on-line training modules adapted from their *Evidence-Based Management* book. The text in the present book introduces the modules and describes how they can be used all or in part in support of EBM teaching or for independent learning. It also shows how you can get more information if you are interested.

This book and the process of developing EBM teaching has been an exhilarating and challenging journey. We hope it encourages you to incorporate EBM into your own teaching. And we are here if you have any questions. And, dear reader, please join us in thanking Rosemarie Lang for her inestimable word-processing help. Thank you, Rosemarie!

About the Authors

Claire Gubbins is a Professor of Organisational Behaviour & HRM at Dublin City University Business School, Ireland, Lead of the LInK Lab at the Irish Institute of Digital Business and she is founder and Director of the Masters in Strategic Learning & Development for the Centre of Executive and International Education at DCU.

Her research interests centre around social relationships at work. She investigates the role of social networks in facilitating learning processes and tacit knowledge circulation; the impact of hybrid/remote working models on social networks and evidence based practice as a mechanism for continuous learning and sustainable education and advancing the HR profession. Her research is published extensively in top tier journals including Human Resource Management (US), Organisation Studies, Human Resource Management, Journal of Management Inquiry, Human Resource Development Quarterly, Advances in Developing Human Resources, Human Resource Development Review, Journal of Knowledge Management and European Journal of Training & Development, as well as numerous book chapters. She is co-author of two books: Learning & Development in Organisations: Strategy, Evidence and Practice with Oaktree Press and Learning and Development Effectiveness in Organisations: An Integrated Systems-Informed Model of Effectiveness with Palgrave.

She has over 20 years experience consulting with industry nationally and internationally in these same areas and is a regularly invited speaker at academic and industry events. She also designs and delivers executive education programmes and workshops for the Centre of Executive and International Education at DCU. She has served as a judge for the National Learning & Development Industry awards.

She received the DCU Presidents award for Excellence in Teaching Innovation in 2013 and was shortlisted on numerous occasions. She was awarded an International Advance HE Senior Fellowship for Teaching Excellence in 2021.

She is an invited Fellow of the Centre for Evidence Based Management (CEBMa). She serves on the council for The Learning & Development Institute of Ireland (L&DI) and the Irish Academy of Management (IAM). She is Chair of the IAM Early Career Development Network supporting early career academics nationally.

Previously Claire was a Fulbright Scholar at Carnegie Mellon University, a visiting Professor in Princess Nourah Bint Abdulrahman University in Riyadh, an Associate Editor for Human Resource Development Quarterly, Director of the award winning DCU Executive MBA Programme, Director of the Graduate Certificate in Strategic Leadership for DCU Executive Education, a Senior Research Fellow on the Enterprise Ireland and IDA funded Irish Centre for Manufacturing Research university-industry project on Tacit Knowledge Management, Learning and Systems and Deputy Director (Learning & Knowledge) of the LINK Research Centre.

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Denise M. Rousseau is the H.J. Heinz II University Professor of Organizational Behavior and Public Policy at Carnegie Mellon. She is Academic Board President, Center for Evidence-Based Management, and Co-Chair, Campbell Collaboration, Management and Business Coordinating Group (MBCG). Rousseau's research focuses upon the impact workers have on the employment relationship and the firms that employ them. Her publications include over a dozen books and over 230 articles and monographs in management and psychology journals. Rousseau is a two-time winner of the Academy of Management's Terry Award for best management book for *I-Deals: Idiosyncratic Deals Workers Bargain for Themselves in 2006 and Psychological Contracts in Organizations: Understanding Written and Unwritten Agreement* in 1995.

She has served as President of the Academy of Management and Editor-in-Chief of the *Journal of Organizational Behavior*. Rousseau received her A.B., M.A. and Ph.D. from the University of California at Berkeley. Rousseau founded the Evidence-Based Management Collaborative, a network of scholars, consultants, and practicing managers to promote evidence-informed organizational practices and decision making. Her book *Evidence-based Management: How to Use Evidence to Make Better Organizational Decisions* with Eric Barends (Kogan Page) is also available for teachers and students in the on-line course in EBMgt at https://oli.cmu.edu/courses/evidence-based-management-o-f/.

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Alessandra Capezio is an Associate Professor of Organisational Behaviour in the ANU Research School of Management, Fellow of the Center for Evidence Management, and the ANU MBA Director. Alessandra's overarching purpose as an organisational scholar-practitioner and educator, is to help people, leaders, and boards, to make more evidence-informed decisions in complex work environments, ultimately for the betterment of society. Alessandra is committed to questioning and 'breaking through' silos, fault-lines, entrenched ways of thinking, relating and doing, and logics and orthodoxies that get in the way of effective organisational decision-making. Alessandra's teaching, research, and practice focus on 1) evidence-based management and practice in organisations, 2) conduct risk 3) boards and governance. Alessandra's research has been published in a number of top-tier journals including the Journal of Management, Human Relations, Journal of Management Studies, Journal of Organizational Behavior, and Journal of Business Ethics.

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Orienting the New Evidence-Based Management Educator

Neil D. Walshe

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Orienting the New Evidence-Based Management Educator

Neil D. Walshe

As an academic, teaching evidence-based management (EBM) has been an all-encompassing and deeply rewarding activity. In the past decade, more than any other class, teaching EBM has provided me with the greatest degree of student engagement and intellectual challenge. At its core, evidence-based practice is a doctrine of empowerment: it introduces, facilitates and affirms a student's curiosity and willingness to challenge existing and established assumptions in a given field. My introduction to EBM was a pivotal moment in my career when as a doctoral student, I was exposed to the evidence-based management community through my doctoral supervisor, Professor Rob Briner. For me, EBM had a commonsensical tone in contrast to much of what was (and is still) taught in university classrooms. Much of academia is siloed, operating on unspoken doctrines of intellectual territoriality, the irrefutable value of the expert and expertise, and the preservation of tight-knit communities of practice that strive to maintain a singular cohesive voice even at the cost of accuracy or transparency (Maxwell, 2019). EBM was, by contrast, a movement that embraced the past indiscretions and errors of its field, encourage transparency, and recantation of past truths. Instead, it strived to create a clear path for those who wanted to see a greater degree of utility and authenticity in how management was taught and practiced. EBM also provided me with an antidote to the imposter syndrome that so usually accompanies academic life: it normalized the idea of not knowing, devalued the absolute nature of expertise, and built a structurally sound bridge between research and practice.

Imposter syndrome in academia is a rite of passage (Abdelaal, 2020). The ever present and crippling doubt that pervades your confidence becomes a strangely consistent part of

your academic career. Initially, I loathed the voice of doubt on my shoulder but EBM has let me embrace it not as something that criticizes me but as something that lays bare the claims made by the research populating the intellectual world I inhabit. EBM is a liberation theology in that it allows us as academics to emphasize that individuals, irrespective of experience or status, are not the zenith of knowledge in management and instead permits us to advocate for bodies of research and communities of practice as having the greatest capacity for contribution. In this way, the liberation occurs at two levels: for students and practitioners, it allows them to review their decisions in the light of evidence; for academics, it liberates us from the expectation that we can always access a ready supply of definitive answers.

I write this chapter with two simple intentions.

1. The first is to provide a roadmap derived from my decade long experiences (positive and negative) in teaching EBM to undergraduate, graduate and executive populations in a university setting. In doing so, I hope to communicate to you, the aspirant EBM instructor, some of the steps that can facilitate your delivery and in turn, positively impact the experience of the students and organizations with whom you work. In parallel, I hope to illustrate the extent to which delivering a course in EBM is both accessible and achievable given the resources available and the community willing to support you in such an endeavor.
2. The second aim is to convey the optimism, utility and gratitude that await you from the students and managers you will encounter. As a skill set, the fundamentals of EBM have market value and the efforts you commit to instruct and advocate for evidence-based practice in the workplace will generate a notable return for you as an instructor. This is especially salient as, by way of opinion, the practice of EBM is needed (and wanted!) both in university classrooms and boardrooms alike. The aims of EBM have a renewed currency among organizational members who having had their fill of fads, fashions and quick fixes. This translates to a population of potential students who are readily and actively invested in looking for an approach and a community that brings something robust to the practice of management.

The Big Picture

If you aspire to teach EBM as part of any management curricula, I encourage you to give consideration to the following as you make your preparations: the students, the content, and (eventually) other faculty. With the adoption of EBM comes an enlightenment (if that is not too much of a romantic overstatement) in student capacity and desire to reflect and deploy a

newly found critical lens upon all that they learn. I offer the following considerations to those about to embark on the teaching of EBM within a business school setting--not as defined doctrine but as illustrations of shared experiences. My hope is that it will encourage others to offer such classes while mitigating the challenges that can come with exposing students and our colleagues to the values of this practice.

In my experience, the teaching of EBM is never solely about the presentation of content or the teaching of technique or process. Instead, it incorporates two different and ill-defined stages that can be challenging to navigate as an instructor. I refer to these two stages as being *evangelical* and *adoptive*. The first of these stages requires a near evangelical approach to the construct of EBM. I choose my words carefully because there is a distinct need to convert students to an evidence-based manner of thinking. I start by illustrating the current state of things, the largely non-evidence-based manner of management education and practice. This entails a process of convincing students of the need for a critical review or approach of how we source, evaluate, teach and incorporate information into the practice of management. Once students become aware of the dissonance present between the established and emergent way of sourcing and evaluating evidence, the second stage takes over. The adoptive stage focuses on the practicalities and mechanics of adopting evidence-based practice, understanding the origins of research, the constraints and challenges of generating and disseminating research findings, and of course, the critical appraisal and communication of research to a population that will ultimately try to use it in the course of organizational life.

In my experience, a common reaction among students to this dissonance is anger. This anger is directed towards the institutions that seem to capitalize on over-stating tenuous relationships between constructs and their effects. It is also directed at themselves for not taking a more critical perspective on that which has been presented to them in the course of their learning. I recall one graduate student, a working professional, who had built a career around the design and delivery of employee engagement initiatives. They were visibly upset at the conclusion of their in-class presentation, which described the (lack of) efficacy of the "*best-practice*" interventions championed for the promotion of employee engagement. I recall her explicit anger upon realizing that she had not scrutinized the construct of employee engagement let alone the interventions around which she had built a consulting career. She was especially fixated on not having noticed that many major interventions around employee engagement just happened to be conveniently alliterative (i.e. Care, Connect, Coach, Contribute, Congratulate; Acknowledge, Affirm, Accelerate etc.) As a teacher of EBM, I see value in these reactions when working professionals realize their own non-evidence based practice. They can be transformative for current students and provide illustrations to support future students in their own adoption process.

Another resonant example was the middle-manager who after two sessions of a six-session class came to the realization that he was engaged in a workplace productivity initiative that had been diagnosed and delivered in the absence of any critical thought or evidence.

The middle-manager's institution had authorized $1.4m USD to be spent on the delivery of time-management training, productivity tracking software, and an incentivization program targeted at 450 employees. The rationale for this authorization was the "*hunches*" of three senior directors that there had been a *"notable"* drop in productivity that needed remedy. Given their position and influence in the organization, their perspectives and opinions of these senior directors were the first and last data points in deciding on this intervention.

What was most notable for the middle-manager (and what had an impact on my own thinking) was not the financial costs incurred but the time, energy and social capital wasted on fixing a problem that may not even exist; in answering a question that nobody had actually asked or as he put it, "*adding another pointless chapter to the tome of futile management interventions.*" There is value in remembering that failures of non-evidence-based practice should be measured not just in the traditional metrics but also in their human and affective costs. Doing so emphasizes the liberating effect that EBM can have for those who see the benefits not only of its adoption but also of breaking away from traditional organizational behaviors and modes of thinking.

Practical Guidance

To assist those in the preparatory stage, I offer the following practical and directive steps. What follows is a roadmap or handrail of sorts for you, the EBM advocate, derived from my own experiences, success and failures to date. Use them as you see fit.

1. Embrace the Community

One valuable source to EBM educators is the broad collaborative community of scholars and practitioners in the evidence-based management movement. The Centre for Evidence Based Management (cebma.org) provides immeasurable teaching support. Beyond providing a certification in EBM, CEMBa is a conduit for resources, teaching materials and process maps to help design and deliver a course in EBM. Beyond this, CEBMa provides you with a community of scholars and practitioners all of whom share a commitment to advocacy for those who teach and enact an evidence-based practice. One should not underestimate the collaborative capacity of this community, members of which are more than open and willing to share resources, time and advice on the teaching of EBM. Evidence indicates that EBM is a social practice, tapping the social networks of both EBM practitioners and scholars (HakemZadeh & Rousseau, 2024). CEBMa and the authors of this Handbook give you access to communities of practice relevant to your teaching. Furthermore, CEBMa provides a vital touchstone for educators in EBM and in parallel provides a strong and established voice that lends legitimacy to the construct of EBM and the visibility and viability of its impact in both academic and professional spheres.

2. Bring a Librarian

As you design and deliver your EBM offering, I encourage you to bring a librarian on the journey and do so as early as possible. I am aware that this may not be a resource open to many educators, but where it is I encourage you to create and maintain this collaboration. Since the very first iteration of my class in EBM, I have partnered with a university librarian and indeed the library as a whole. Their involvement, principally with assisting students in understanding and navigating the library's multitude of databases is invaluable. Students benefit from an in-class orientation by an information science professional to these databases and other library resources. This has been especially true for graduate and executive students of EBM who often become fixated on their organization's limited capacity to access traditional academic journals and databases. Having a librarian emphasize the breadth and scope of available resources drives home the concept of EBM being concerned with the "best available evidence" and accessing it in an expedient and cost-effective manner. This partnership has also created yet another voice of advocacy for the EBM movement within the wider University.

3. Prepare for Different Student Populations

GRADUATES

Where possible, I encourage educators to deliver their first iteration of any EBM class to a population of graduate students, ideally those with some work experience. The rationale for doing so is to provide you with an optimized population who will not only understand the constructs contained within EBM but will also have lived experience with organizational processes, dynamics and micropolitics. Given the challenges in teaching the value of context (Johns, 2000), workplace exposure allows them to see the contexts in which EBM is needed and more explicitly, how it can address the challenges faced by organizational decision makers. Graduate students may also be able to address issues they themselves have experienced or are currently undergoing at work. They offer the opportunity to discuss and evaluate practices from their work in class—and can give the EBM instructor great examples and discussion points.

Graduate students who are executives have the highest risk exposure in advocating adoption of any new practice given the consequences for their organization, their employees and of course their own careers and reputation. The term "*proof*" among the social sciences is a dirty word at the best of times (*Heintz, 2003*). In preparing to teach this population, be aware and prepared for the recurrent request for "*proof*" that something works (Taylor, Dossick & Garvin, 2011). In fact, the burden of proof can be a dominant and derailing function of almost every narrative within teaching evidence-based practice (Ryens, Colbert & O'Boyle, 2018). This needs to be approached with compassion and empathy towards executives as a population who have borne the cost of a recurrent cycle of management fads. They have been encour-

aged to adopt that which is new and novel over that which is established and transparent. As such, they are the population with the greatest fear of adoption since they have seen the costs of acting on false promises. Despite this, they stand to benefit the most from the adoption of an evidence-based approach given they are central to breaking the cycle of adoption and subsequent disappointment.

UNDERGRADUATES

In preparing to teach EBM for undergraduate populations other factors should be considered. With an undergraduate population, the evangelical stage tends to be more easily accepted as it does not require the unlearning of existing opinions, practices and reward structures. However, it does come with the additional challenge of a limited notion of the politics, social capital exchanges and costs of being evidence-based in real work settings.

EBM teaching becomes easier at different stages depending on the population. For undergraduates, greater effort needs to be directed on sourcing external organizational partners like industry visitors or company projects that expose students to organizational realities surrounding the use and practice of EBM. It should be remembered that undergraduates have in many ways the most to gain from exposure to EBM in that they have not yet formed nor conformed to existing organizational structures and pressures that may advocate non-evidence-based approaches. As such, they have a lower adoption and switching cost to learning the practices of an evidence-based manager and for this reason, as a population, they have a crucial role to play in diffusing EBM to practice.

4. Recognize and Teach the Value of Context

Design your course with sufficient space to convey the historical and intellectual history associated with evidence-based practice in fields outside of management. When students can see that evidence-based management has a lineage in other disciplines it helps legitimate the construct of evidence and its use in practice. Once students see that evidence-based practice has become established and normative across a broad range of disciplines (e.g. probation (Trinder, 2000); public policy (Davies & Nutley, 2000); education (Elliot, 2001); nursing (Breytenbach et al., 2017) etc.) it generates a degree of confidence not solely by association but also by allowing them to see the trajectory, challenges and outcomes of adoption. Indeed, much value can be drawn from the historical context of medical practice and teaching and its path towards being an established evidence-based practice.

Many educators may sacrifice this contextual history to proceed with the mechanics of sourcing, evaluating, and synthesizing scientific evidence into a usable output. There is no denying that students perceive a value in the "*doing*" of evidence-based practice but its short-sighted to downplay the wider and well-established community of evidence-based practice. I advise providing the time and space for students to see and understand that there is a history,

community and process associated with the practice of EBM that extends beyond just the realm of organizations and management itself. Understanding the origins (Rosenberg & Donald, 1995; Sackett & Rosenberg, 1995), and resistance to evidence-based practice (Feinstein, & Horwitz,1997; Williams, & Garner, 2002; Cohen, Stavri, & Hersh, 2004; Lilienfeld, Ritschel, Lynn, Cautin, & Latzman, 2013) permits students to place themselves on a timeline of potential adoption and recognize how their efforts and potential adoption of the construct can build towards an additive movement where evidence-based practice becomes the norm (Hatala, & Guyatt, 2002; Howard, Diug, & Ilic, 2022). This historical context helps students see their actions and efforts of part of a wider system and highlights a "proof-of-concept" example as to how a field can adapt and potentially transform itself.

5. Emphasize EBM as a Generative Force (and not solely a reductive one…)

As an instructor, it is imperative that you present EBM as a generative and not solely reductive concept. EBM is not just about the debunking of fads and fashions. Try to convey EBM's capacity to be constructive, healing, and empowering in redesigning organizational practices. EBM can sometimes be perceived as being overly focused on proving people and concepts to be wrong (Mullen & Streiner, 2006;. Nevo & Slonim-Nevo, 2011). I note that when students are empowered with the fundamentals of critically appraising scientific evidence, there is a period where they can and often do enter a phase of debunking. In doing so, they begin a process of sensemaking (Sandberg & Tsoukas, 2015) where they evaluate what was, to that point, established knowledge in their own academic or professional domain. Having the capacity to evaluate the evidence that propped up this knowledge can lead to a realization that many (or all) of their assumptions were built upon flawed, limited or highly extrapolated knowledge. This can be somewhat liberating for many students but needs to be named and accommodated in the class to ensure that the practice of EBM is not solely characterized by the act of negating established practices. I advise making explicit effort to turn the critical process into a constructive one where the students can start to evaluate and offer alternatives derived from their critical appraisal of the evidence (and only from the evidence). They should not become the evidence police! There is a limited tolerance within professional communities for people who can, with confidence, highlight the flaws and failures of managerial practice *without* providing a better alternative, thoughtful questions, or new avenues of inquiry. Encourage a constructive approach with a dose of empathy for the organization and its respective challenges.

6. Teach How to Ask Better Questions

EBM is not just about answering questions, it is also about helping students and their organizations ask better questions. EBM students learn organizations have a notable capacity

to focus on the wrong question when trying to solve problems (Krieger, 1990). Spend time developing a student's capacity to move beyond simply answering the questions organizations present them with. Students need to be encouraged to challenge whether the question(s) valued by the organization actually addresses the issues at hand. I encourage educators to build a discovery component into any conversations that students (specifically undergraduate students) have with external organizations so that they can be exposed to the common assumptions, biases and organization pressures that lead to people ask poor or misdirected questions. In doing so, you'll empower them to question assumptions and hopefully ask better questions themselves. At the same time, providing students with opportunities for informational interviewing with organizations can have a transformative effect on their capacity to engage with organizational challenges and see connections with their EBM training.

7. Encourage a Student-Centric Movement

I encourage all educators to assist in the creation and on-going support of an outside and post-class community which connects EBM students to a wider audience engaged in evidence-based practice. This can be achieved by investing in student-led societies that meet, communicate and advocate for EBM and its adoption. In many North American university campuses, student-led organizations create communities in topics such as Startup Clubs, Investment Clubs, Women in Business, AI Adoption etc. Let's try to add EBM to this growing list, for both a greater degree of perceived legitimacy of the practice as well as promoting EBM awareness among faculty and university administration. In respect to my own experience, students have successfully organized speakers from within the field, site-visits to organizations who have adopted an evidence-based perspective and fostered partnerships with other associations to extol the virtues of EBM. With increasing frequency, past students (both undergraduate and graduate) follow up with myself and others to maintain the connection to EBM and the teaching process for EBM students who come after them.

8. Get Faculty Colleagues on Board - EBM is in the Building!

I began this essay by directing the EBM educator's attention to the nuances of the student population, the content being delivered, *and* to the other institutional stakeholders involved. The latter are focus of the caveats and cautions I raise here. Faculty colleagues in our academic institutions play a pivotal role in the success and adoption of EBM both in terms of the spillover our students generate into their own class discussions and the impact of students exposure to an evidence-based lens on a school's educational offerings.

As you prepare the design and delivery of your class, do not neglect the importance of connecting with other faculty by way of communicating your intentions and ambitions and as an act of inclusion. As noted, evidence-based practice has a history of being resisted within many fields Indeed, understanding this resistance is a pivotal point in any student's

understanding of the path to adoption of an evidence-based practice. Established practices, especially those enacted by a majority of those often perceived as "experts" within a field, are hard to shift (Turner, 2001; Quirk, 2010).

Empowering students to adopt an EBM lens permits them the opportunity to focus it on all that they have learnt and while doing so, to challenge, deconstruct, and revise what's taught to them. Although this is proof of concept in practice and illustrative of the inherent value of what EBM is trying to do, it can have the unintended consequence of highlighting the relative absence or ignorance of evidence in most business school curricula. Understanding that the potential loss of status and social capital for faculty exposed to a student population newly empowered to question notions of "*best practice*" and theoretical dominance in a given field can be somewhat jarring. In brevity; your faculty colleagues may not be prepared for this level of scrutiny exercised by this specific population.

The central tenets of EBM advocate for the values inherent in a revisionist mentality; one that will willingly reject past knowledge in favor of emergent evidence. Indeed, it is this capacity for evidence-based practice that make it a worthy and vital process for the advancement of management in the same way that it has been transformative to medicine, social work and to public policy etc. However, and by way of experience, I offer the suggestion that this manner of resistance is in itself a symptom which validates the need and utility of an evidence-based lens. I encourage you, as you prepare to teach EBM within your specific academic domain, engage in a process of reflective contemplation (Napora, 2017); one guided by compassion and empathy directed towards an understanding the origins and rationale for resistance to evidence based anything. So much energy is spent on adapting and preparing content for student populations and in the course of doing so, what is often forgotten is the crucial need for faculty tolerance, support and ambitiously, advocacy for any realm of evidence-based practice.

Pragmatically, I therefore encourage you to operative from the principle of inclusion and spend some time educating your colleagues, not just on the principles and practices of EBM but the likely fact that it may well encourage students to have a higher degree of critical inquiry. Full disclosure, this was something I failed to do in my early days of teaching and the consequence greatly hindered the subsequent adoption of EBM into the wider university curricula. Academia is in itself part of the problem in as much as it encourages a mantle of expertise (van Helden et al., 2012), focusing on valuation of an individual's capacity for knowledge rather than a field's capacity to accommodate a body of evidence. It popularizes individuality and personification of knowledge rather than a collective or distributive knowledge and with all of this comes the added consequence of ego. Academia is built upon the individual's capacity to have a higher *status* of knowledge rather than a higher utility of that of knowledge (Mieg & Evetts, 2018). With this in mind, I encourage you to not only prepare your colleagues for the content and practice of EBM but also encourage them to be part of this very process by being more open to student scrutiny of why say, a marketing class champions one specific

theory over another, why a HR class advocates for the use of practices that we have little if any quality of evidence to rely upon.

You can, without a great degree of effort, facilitate a process whereby colleagues can be permitted to ask these questions of themselves prior to them being probed by students. For me, this was as simple as creating a fact sheet, slide deck and accompanying video that explained the origins, rationale and process of EBM and how I was going to structure and teach the class. Initially, I shared this information among colleagues in my immediate academic department and then among all department chairs in the school of management. In time, I was able to have it included in circulars, newsletters and eventually in faculty orientation and onboarding materials at both the undergraduate and graduate level. Similarly (and in truth with far greater impact) I encouraged all EBM students to include, as part of their email signatures, a link that simply asked "Why am I evidence-based?". This led to a dedicated site which hosted all of the above explanatory material. The consequence of these efforts can go a long way towards embedding EBM as a viable and valued topic in any curriculum while conserving the professional capital of other faculty.

Final Thoughts on What I Have Learned

In writing this chapter, I reviewed the changes between my first syllabus and the most recent iteration to understand how my process has evolved (if at all). To conclude I would like to share just two of the most noteworthy shifts that may be of use to those preparing to teach EBM.

First, as a culminating project within the class I used to ask students to consider a question from their existing learning that they "*knew to be true*". Invariably this involved them addressing something that was fundamental to their existing knowledge base. As such, it required students to address questions where there was already a great deal of existing (and often assumed) knowledge (Questions tended to explore traditional organizationally relevant topics such as *"What is the relationship between pay and performance?"; What effect do leadership styles have on employee retention?" etc.).* The rationale behind the exercise was to have them ask a question of the wider literature and through a systematic process, shed light on the extent to which they were able to reinforce or detract from something that was close to their interests.

Students tended to either find confirmation of a process or practice and thus develop a greater degree of confidence in what they knew. Yet they also recognized where there were still questions to be asked or better questions to be generated. Alternatively, they might find that something that they "*knew to be true*" had little if any evidence to offer support and where it did, scrutiny tended focused on the limitations of the research and its respective application. However, after two or three iterations of the exercise across classes, I noted that students would invest huge amounts of effort into generating confirmatory bias for their questions to

preserve their existing understanding (schema). The exercise, intended to be illustrative of our own assumptions around evidence became a very introspective and isolative process that divorced the students from the social value of their questions and subsequent answer.

Now, in contrast, I have students pose two questions derived from the same prompt. They complete the exercise on their own chosen question but the second question is completed as part of a group process ensuring that no group is in possession of a question of their members creation. What is noticeable is the depth of effort that students place on addressing questions that they *need* to be true, something made more visible by the contrast of working with a question with which they have little to no initial investment or even interest. This shift has drawn two important points to the forefront of student learning. Firstly, it illustrates our capacity to preserve knowledge which we have built existing intellectual (and often career assumptions) upon thus highlighting the challenge in viewing evidence through a critical and systematic lens. The affective bias around the questions we ask and the answers we try to find to them is notable (see Rynes et al. 2018). The second aspect that it emphasizes is to highlight the value of detachment that comes from having a degree of distance from a specific question. Impartiality and objectivity are more easily obtained when we have conceptual distance from the origins and rationale for the questions we are trying to answer. The process also serves as an opportunity to examine the inherent flaws that can be present in a question (i.e. "Is there a difference between…" Vs. "What is the difference between…") and more importantly, the steps that need to be employed in asking better questions. Finally, students have consistently reported this to be a meaningful exercise because it takes place in a dedicated community of practice where students are motivated to find and make use of the best available research in the course of answering a question as a group rather than advancing their own specific outcomes. It is a welcome reminder of the value of a community of practice guided by systematic principles that promote transparency rather than privileging or promoting a specific viewpoint and the challenges that come with trying to do so.

Second, my earlier syllabi took a largely reductive tone. In its early iterations it drew attention to the collective limitations within managerial disciplines. Although this was usually well received by students, it soon became apparent that this was not sufficient in ambition or in utility, especially among graduate populations motivated to critically appraising research evidence to influence actual decisions. Even if there was no or only low-quality evidence, action might still be required. I came to appreciate that EBM must be concerned with inducing a degree of sobriety and clarity to the components of management research while being constructive about what we do know. In seeking to promote the EBM construct and the wider evidence-based practice movement since we must be able to direct those in management roles towards that which we *DO* have evidence to support and not simply emphasize where and how the field has failed. My earlier structures created an Us vs Them approach which tended to reinforce the silos of academia and practice rather than acknowledge and leverage the learning potential from having both groups engage with one another.

Initially, I emphasized that the class was intended to be a space in which to develop a critical capacity for using research literature and to refine how we ask questions and evaluate the sources used in our answers. In truth, the approach was reclusive and isolationist, focusing on EBM skills and evidence obtained in private and then brought to the organizational realm for applied use. I now emphasize the need to include organizations and organizational members from the outset of the class so that students can, in partnership, see first-hand the imprecise and awkward way in which managers, their questions and the research literate interact. Indeed, I now place emphasis on creating a symbiotic process where students can become familiar with how to better answer questions but more importantly, how to help organizations ask better questions from the outset. Students are now, on a weekly basis, paired with organizational actors (largely working professionals who are past EBM students) who are free to pose any questions of the literature through the students in a consultative capacity. The aim of these interactions is to create a realistic exposure of managerial challenges, organizational pressures and the necessity of having construct clarity when composing questions. The learning curve here is one governed largely by compassion; compassion on the part of the students in seeing how difficult it can be for managers to communicate a question or intention. Indeed, my classes have become more compassionate towards the role of managers and their use (or the lack thereof) of available research. Instilling this early into students creates a facilitation rather than falsification narrative that can transform a question such as; "*what is the best way to motivate teams?"* into a line of inquiry that instead highlights the social, political and organizational pressures that create these kinds of questions; questions which can in turn can drive us towards answers contingent on fads and quick fixes more than anything else. Encouraging students to explore the narratives that can often exist behind these sorts of questions places them in a position where they can inquire as to where this supposed need for increased motivation comes from? Who or what is emphasizing an existing deficit in current motivational process?, or indeed, what the expected consequences for any motivational process actually are? In doing so, students assign themselves a capacity to work in conjunction with an organization not just to answer a solitary question but also to generate greater understanding of the processes that have led to such a question.

By exposing students to organizational challenges and using EBM processes in partnership with managers, students come to see how to use EBM in actual organizational processes. Recurrently, students report these weekly engagements with organizational members and managers as being among their most meaningful learning experiences as they come face to face with the challenges and opportunities present in the practice of EBM and honing their skills to ensure that EBM is seen not solely as a mechanism to highlight and avoid poor quality decisions. By helping to direct organization decision makers towards interventions for which we do have greater quality evidence, we help students to learn how to make more effective and evidence-based decisions.

References

Abdelaal, G. (2020). Coping with imposter syndrome in academia and research. *The Biochemist*, *42*(3), 62-64.

Breytenbach, C., ten Ham-Baloyi, W., & Jordan, P. J. (2017). An integrative literature review of evidence-based teaching strategies for nurse educators. *Nursing Education Perspectives*, *38*(4), 193-197.

Cohen, A. M., Stavri, P. Z., & Hersh, W. R. (2004). A categorization and analysis of the criticisms of evidence-based medicine. *International Journal of Medical Informatics*, *73*(1), 35-43.

Davies, H. T., & Nutley, S. M. (Eds.). (2000). What works?: Evidence-based policy and practice in public services. *Policy Press*.

Elliott, J. (2001). Making evidence-based practice educational. *British Educational Research Journal*, *27*(5), 555-574.

Feinstein, A. R., & Horwitz, R. I. (1997). Problems in the "evidence" of "evidence-based medicine". *The American Journal of Medicine*, *103*(6), 529-535.

HakemZadeh, F., & Rousseau. D.M. (2024). Evidence-based Decision Making as a social endeavor. *Behavioral Science and Policy*, in press.

Hatala, R., & Guyatt, G. (2002). Evaluating the teaching of evidence-based medicine. *Jama*, *288*(9), 1110-1112.

Heintz, B. (2003). When is a Proof a Proof?. Social *Studies of Science*, *33*(6), 929-943.

Howard, B., Diug, B., & Ilic, D. (2022). Methods of teaching evidence-based practice: a systematic review. *BMC Medical Education*, *22*(1), 742.

Johns, G. (2001). In praise of context. *Journal of Organizational Behavior*, 31-42.

Kriger, M. P. (1990). The art and power of asking questions. *Organizational Behavior Teaching Review, 14*(1), 131-142.

Lilienfeld, S. O., Ritschel, L. A., Lynn, S. J., Cautin, R. L., & Latzman, R. D. (2013). Why many clinical psychologists are resistant to evidence-based practice: Root causes and constructive remedies. *Clinical psychology review*, *33*(7), 883-900.

Maxwell, N. (2019). 5. The Scandal of the irrationality of Academia. *Philosophy and Theory in Higher Education, 1*(1), 105-128.

Mieg, H. A., & Evetts, J. (2018). Professionalism, science, and expert roles: A social perspective. *The Cambridge handbook of expertise and expert performance* (2nd ed., pp. 127-148).

Mullen, E. J., & Streiner, D. L. (2006). The evidence for and against evidence-based practice. *Foundations of evidence-based social work practice*, 21-34.

Napora, L. (2017). A contemplative look at social change: Awareness and community as foundations for leading. *Journal of Contemplative Inquiry*, *4*(1), 10.

Nevo, I., & Slonim-Nevo, V. (2011). The myth of evidence-based practice: Towards evidence-informed practice. *British Journal of Social Work*, *41*(6), 1176-1197.

Quirk, P. J. (2010). The trouble with experts. *Critical Review*, *22*(4), 449-465.

Rosenberg, W., & Donald, A. (1995). Evidence based medicine: An approach to clinical problem-solving. *BMJ*, *310*(6987), 1122-1126.

Rynes, S. L., Colbert, A. E., & O'Boyle, E. H. (2018). When the "best available evidence" doesn't win: How doubts about science and scientists threaten the future of evidence-based management. *Journal of Management*, *44*(8), 2995-3010.

Sackett, D. L., & Rosenberg, W. M. C. (1995). On the need for evidence-based medicine. *Journal of Public Health*, *17*(3), 330-334.

Sandberg, J., & Tsoukas, H. (2015). Making sense of the sensemaking perspective: Its constituents, limitations, and opportunities for further development. *Journal of Organizational Behavior, 36*(S1), S6-S32.

Taylor, J. E., Dossick, C. S., & Garvin, M. (2011). Meeting the burden of proof with case-study research. Journal of Construction Engineering and Management, *137*(4), 303-311.

Trinder, L. (2000). Evidence-based practice in social work and probation. *Evidence-Based Practice: A Critical Appraisal,* 138-162.

Turner, S. (2001). What is the Problem with Experts? *Social Studies of Science*, *31*(1), 123-149.

Williams, D. D. R., & Garner, J. (2002). The case against 'the evidence': A different perspective on evidence-based medicine. *The British Journal of Psychiatry*, *180*(1), 8-12.

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Teaching Evidence-Based Management at the University of Prince Edward Island: Reflections On the First 15 Years

Tina Saksida and R. Blake Jelley

SUPPORTING THE EVIDENCE-BASED MANAGEMENT EDUCATORS

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Teaching Evidence-Based Management at the University of Prince Edward Island: Reflections On the First 15 Years

Tina Saksida and R. Blake Jelley

This chapter provides an overview of the history of evidence-based management (EBMgt) education in the University of Prince Edward Island's McDougall Faculty of Business. We share insights from our experiences teaching EBMgt to undergraduate and MBA students and highlight key assignments and class activities, including EBMgt case competitions, systematic approaches to literature reviews, and capstone course projects. A separate chapter, titled *Combining Cases and Research Proposals to Teach Evidence-Based Management,* elaborates on one of these assignments.

Evidence-based management involves critically considering research evidence, local data, ethics and stakeholder concerns, and practitioner judgment to enhance the quality of organizational decisions and practices (Briner et al., 2009). A key barrier to its adoption in practice has been the stark absence of EBMgt education in business schools (Charlier et al., 2011). Increasingly, there have been calls for a profound shift in management education to help narrow the research-practice gap and support a movement toward a more evidence-based approach to the management of organizations (Burke & Rau, 2010; Rousseau, 2012; Rousseau & McCarthy, 2007; Rynes et al., 2014). EBMgt education is becoming more widespread. For example, on its website, the Center for Evidence-Based Management (CEBMa, n.d.), a leading non-profit consortium for EBMgt scholars and practitioners, currently lists 120 universities and business schools that offer courses covering some aspect of EBMgt. However, these efforts are still in their infancy compared to, for example, the teaching of concepts advocated by famous "gurus" (Graen, 2009). Consequently, there is a need for EBMgt educators to

reflect on and share their teaching methods (see Briner & Walshe, 2014; Dietz et al., 2014; and Jelley et al., 2012 for helpful examples) and encourage others to adopt, refine, test, and debate ideas for fostering EBMgt.

This chapter describes initiatives in the University of Prince Edward Island's (UPEI) McDougall Faculty of Business that are intended to promote an EBMgt "mind- and skill-set that can transfer to an applied setting" (Gamble & Jelley, 2014, p. 437) among our undergraduate and Executive MBA (EMBA) students, spearheaded by the authors of this chapter and others in the McDougall Faculty of Business (MFoB). We further elaborate on a key EBMgt project – a case-based research proposal – in Jelley and Saksida, this volume.

Note: The UPEI Faculty of Business was named the McDougall Faculty of Business in April 2024. While most of the events described in this chapter took place before the naming, we refer to the Faculty by its new name.

Why Teach Evidence-Based Management?

The benefits of applying principles derived from organizational research to managerial practice have been espoused for decades (Briner et al., 2009) and demonstrated empirically through, for example, specific interventions designed to improve productivity (Pritchard et al., 2008). Despite these benefits, there remains a profound disconnect among research, teaching, and practice in management (Burke & Rau, 2010; Fisher et al., 2021; Rousseau, 2012; Rynes & Bartunek, 2017; Rynes et al., 2002, 2014), with most managers basing their decisions on their personal experience and judgment, without necessarily considering the best available evidence (Barends et al., 2014). According to Rousseau and McCarthy (2007, p. 99), this "absence of a critical mass of evidence-based managers today translates into both poorer outcomes for organizations and into pressures to conform to more ad hoc approaches. An entire generation of evidence-based managers may be needed before organizations make wide use of scientific evidence in their decisions."

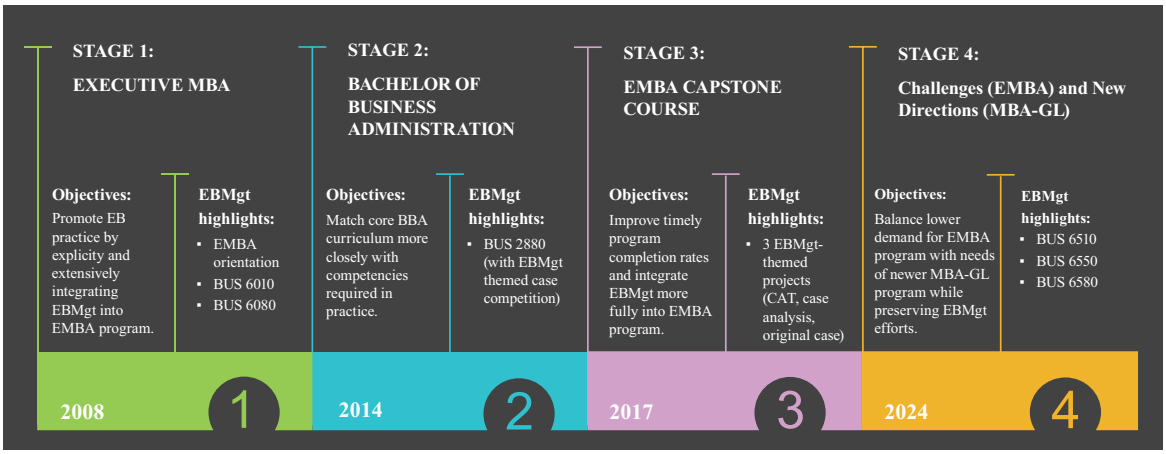
Helping managers adopt an EBMgt perspective and narrowing the research-practice gap has not been, and will not be, easy. Management is not a profession with a well-defined body of knowledge or entry-to-practice standards. Even among managers with a relevant graduate degree, management education may be an acute obstacle. Management students, including MBAs, are usually not taught how to access, interpret, or use research evidence to inform decision-making (Briner & Walshe, 2014; Charlier et al., 2011; Graen, 2009; Rousseau, 2006, 2012; Rousseau & McCarthy, 2007). For instance, a review of over 800 course syllabi from 333 MBA programs found that research evidence in general, and EBMgt in particular, was not featured prominently: only a few courses directly mentioned EBMgt, while a more liberal operationalization of EBMgt, which included related terms like "research" or "evidence," was featured in about 25% of core MBA courses (Charlier et al., 2011). Even when EBMgt

is covered, educators who adopt an evidence-based approach can encounter resistance from students, particularly when students' beliefs and assumptions are challenged (Jelley et al., 2012).

EBMgt Education at the University of Prince Edward Island: A History

Instilling an appreciation for principles derived from formal research and developing students' critical thinking skills are crucial to effective EBMgt education. This approach to management education features prominently in UPEI's undergraduate and graduate business programs, with courses in research methods and EBMgt, EBMgt-themed case competitions, (appropriately scaled) systematic literature reviews, skill-building library workshops, and more. The integration of EBMgt into management education in the McDougall Faculty of Business has taken place in four stages over the past 15 years (see Figure 1).

Figure 1. A History of EBMgt Education at UPEI



Stage 1 – Executive MBA

EBMgt was first incorporated into our EMBA program, which launched in 2008. Inspired by Denise Rousseau's 2005 Presidential Address to the Academy of Management, where she advocated for EBMgt and called on educators to help bridge the research-practice gap (Rousseau, 2006), two faculty members (including this chapter's second author) spearheaded this EBMgt initiative. The other early EBMgt champion (and now former UPEI colleague) was a seasoned executive whose faculty duties included an administrative leadership role with the EMBA program. This chapter's first author now occupies a similar graduate-program leadership role. Whereas much of what and how we teach EBMgt has been a function of academic freedom, it is likely that having successive EBMgt champions in a key position, and faculty member participation on a program advisory committee, helped foster an integrated approach

within the EMBA program. Since the program's early days, EBMgt has been explicitly and extensively integrated into the EMBA orientation session and two core courses (described below), with other core and elective courses offering additional opportunities for the development and application of EBMgt knowledge and skills.

Stage 2 – Bachelor of Business Administration

The second stage occurred as part of curriculum changes to our undergraduate business programs that came into effect in 2014. The focus here is on the Bachelor of Business Administration (BBA) program given its status as the MFoB's flagship undergraduate program, but our other undergraduate programs (i.e., Accelerated BBA, Bachelor of Business in Tourism and Hospitality, and Bachelor of Business Studies) share many similarities to and courses with the BBA, including the principal EBMgt course – BUS 2880 – described below. When the MFoB began a review of its undergraduate curriculum in 2012, this was driven by a desire to offer students opportunities to pursue different interest streams and match the core curriculum more closely with competencies required of managers in practice. In their study assessing the alignment of MBA curricula from 373 business schools with competencies required for managerial work, Rubin and Dierdorff (2009) used a competency model derived from data provided by 8,633 managers across 52 occupations. They found that competencies deemed most important by incumbent managers were given the least coverage in MBA programs. Specifically, *managing human capital* and *managing decision-making processes* competencies were rated highest in relevance by practitioners, yet were the most underrepresented in MBA curricula.

The MFoB curriculum review team at that time determined that Rubin and Dierdorff's (2009) findings applied well to the BBA program. Of particular note here is the decision-making dimension, which includes one's ability to access and appraise the quality of information, and which may be covered by courses on decision-making models, statistics, or research methods (Rubin & Dierdorff, 2009). The team found some relevant courses in the old BBA curriculum (e.g., statistics, a research project course) but also uncovered deficiencies, particularly regarding research methods and managerial decision-making. This gap, coupled with favourable experiences with EBMgt education in the EMBA program, resulted in the addition of a required second-year course in research methods and EBMgt in the new (2014) undergraduate curriculum. Incidentally, the most intense pressure for that new course did not come directly from the second author of this chapter (a member of that curriculum review committee). It was another committee member who insisted that our undergraduate students be given more explicit access to the EBMgt perspective that had become central to the EMBA program.

We have occasionally presented or otherwise provided information about EBMgt to our UPEI colleagues to increase their awareness, help them improve their practices, and find or cultivate like-minded allies and collaborators. The benefits of this internal EBMgt promotion have shown up in some obvious (and perhaps unexpected) ways. For example, the second

author of this chapter co-authored a top-tier publication on learning about EBMgt through case competition with a colleague who, at the time, was a professor of accounting and the case competition coach in the MFoB (Gamble & Jelley, 2014; the colleague has since left UPEI). On the teaching front, this chapter's first author developed the EBMgt-themed Capstone Course in the EMBA program, a major program change, with another MFoB colleague who specializes in strategy and international business. Internal buy-in has manifested in other, less obvious ways as well. For example, MFoB colleagues with limited prior exposure to EBMgt have sought out opportunities to teach our undergraduate and graduate EBMgt-themes courses, incorporated EBMgt into their own courses, or volunteered to help judge EBMgt-themed case competitions.

Stage 3 – EMBA Capstone Course

The third stage of our EBMgt educational journey centred on the creation of the EMBA Capstone Course as an alternative to the existing Signature Project, a thesis-like project that had been a requirement of the EMBA program until the introduction of the new capstone course (both are described in more detail later in the chapter). This change was prompted by several considerations. For one, a significant proportion of students were taking longer than the program's two-year duration to complete their degree due to delays with signature project work. Feedback from past students also indicated that many of them found the signature project to be one of the more isolating and less enjoyable aspects of the EMBA program. In addition, given the MFoB's small size, the signature project supervision process presented a significant burden on our faculty. Most notably, though, this change was also prompted by our desire to integrate EBMgt more fully into the program.

The EMBA Capstone Course, which was first offered in the winter of 2017, explicitly incorporates EBMgt into all course components, including EBMgt-themed case competitions and a scaled-down version of a systematic literature review, helping reinforce EBMgt as the central theme of our EMBA program. Most students now take the Capstone Course at the end of their program; we normally only have one or two students completing a signature project in any given year. This course has been a success in several ways. For instance, it has drastically improved (timely) program completion rates: the percentage of EMBA students completing their program requirements on time was 76% in 2016, compared to 88% (2017), 94% (2018), 100% (2019), 88% (2020), 100% (2021), 90% (2023), and 91% (2024) in the years since the Capstone's introduction. (The course was not offered in 2022 because there was no EMBA intake in 2020 due to the COVID-19 pandemic.) Enthusiastic student feedback and our own observations also show that the Capstone Course has become a highly engaging and enjoyable highlight of the EMBA program. Finally, this course is an excellent tool for engaging our MFoB faculty and EMBA alumni through the in-class competition judging panels (more on this below).

Stage 4 – Challenges and New Opportunities

Our EMBA numbers had been slowly declining since the program's start in 2008, but the EMBA program has suffered particularly low demand in recent years and is currently on hiatus. The drop in demand has likely been driven by several factors, including a saturated local market, (relatively) high tuition cost (the setting of fees is outside of the MFoB's control), unfavourable macroeconomic conditions, and general trends in executive education (see, for example, Graduate Management Admission Council, 2022). A further liability for the EMBA program was (unintentionally) self-inflicted; in 2018, the MFoB added another graduate program – an MBA in Global Leadership (MBA-GL). This program was originally intended as a 12-month program for recent university graduates just embarking on their career, but its substantially lower cost and the subsequent addition of flexible scheduling options have also started attracting candidates who historically would have applied to our EMBA program. Thus, the (ongoing) fourth stage of our EBMgt story has revolved around the EMBA's uncertain future and the need for reinvention.

The MBA-GL program has been growing steadily since its start in 2018 and has been particularly popular with international students. Whereas this program does not explicitly feature EBMgt as a program theme due to its primary focus on global leadership and the international business environment, some course instructors have incorporated EBMgt components into its curriculum, particularly into courses on Global Leadership and Ethics (BUS 6510), Management and Organizational Behaviour (BUS 6550), and Statistics and Business Analytics (BUS 6580). For example, the foundational Global Leadership and Ethics course has included a text that takes an evidence-based approach to leadership (Barling, 2014), a team project that requires a systematic approach to a literature review (Barends et al., 2017a), and skill-building exercises. The skill-building exercises feature students' creation, sharing, and peer-feedback of a series of short videos in which they practice enacting transformational and charismatic leadership behaviours inspired by relevant experiments (Antonakis et al., 2011; Barling et al., 1996; Kelloway & Barling, 2000).

These types of initiatives contribute meaningfully to our overall efforts to promote EBMgt, but given the uncertain future of our EMBA program, a more deliberate approach is likely needed within the MBA-GL. As the MBA-GL program enters its first quality assurance review cycle, the program's leadership team has begun discussions around potential curriculum changes and new directions. The global leadership focus has worked well as a branding and pedagogical tool, but there is growing recognition among faculty and program administration that our wealth of experience with EBMgt education, particularly in the EMBA program, can help augment the MBA-GL program as well.

EBMgt Education for Undergraduates

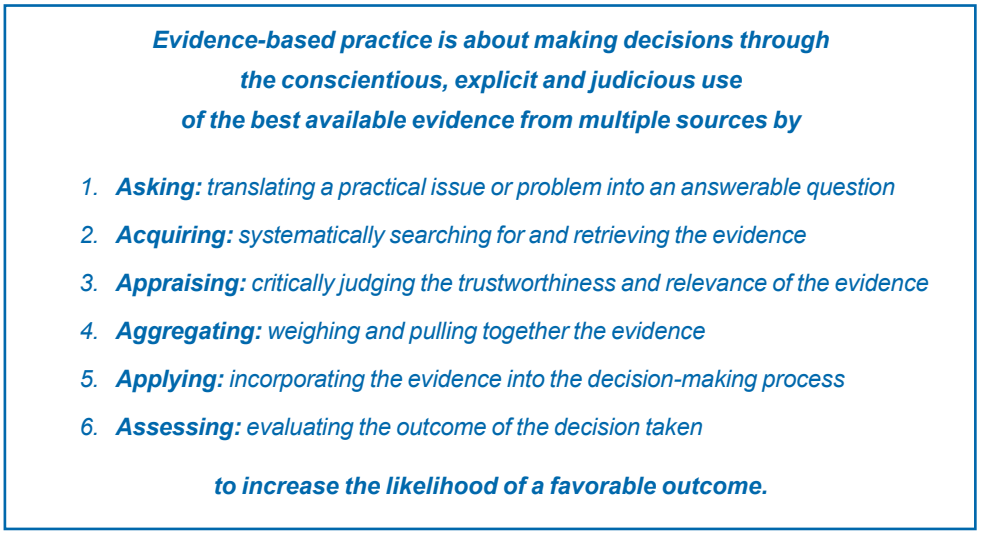
Following the BBA curriculum changes of 2014, the authors of this chapter were tasked with developing an undergraduate course that would provide business students with a comprehensive introduction to research methods and EBMgt. This required second-year course, officially titled Research and Evidence-Based Management (course code BUS 2880), was first offered in the fall of 2015. In addition to exposing students to the fundamentals of the research process, the course also equips them with basic EBMgt knowledge and skills. While primarily an introductory research methods course, this course expressly links the study of research methods to the pursuit of better managerial decisions, to the point where it has become commonly known as just Evidence-Based Management among our students and even staff. Appendix A includes a sample course schedule for a Winter 2024 section of BUS 2880 (adapted from a course syllabus by Jelley, 2024).

Integrating EBMgt into a Research Methods Course

BUS 2880 advances students' EBMgt knowledge and skills in several ways. First, we introduce students to the three elements of the research trinity: research design, measurement, and analysis (Kline, 2009; Pedzahur & Schmelkin, 1991). The course covers both quantitative and qualitative approaches to research as well as specific design options, data collection methods, and analytic procedures in a conceptual (vs. computational) manner. Literature searching and question formulation are also featured. Such methodological knowledge supports the "pull" approach to EBMgt (Barends, 2012; Barends et al., 2014), which is focused on teaching students how to search for, appraise, and apply research evidence (see Figure 2). This is distinct from yet complementary to the "push" approach to teaching EBMgt (Jelley & Carroll, 2012), which involves the dissemination of core management theories and principles derived from formal research. In line with the pull approach, BUS 2880 teaches students how to design, consume, and use research, equipping them with skills that are essential to becoming an EBMgt practitioner. Linking research methods content to the EBMgt framework and managerial decision-making is designed to foster students' perceptions that research methods knowledge is relevant to their business education (Jelley et al., 2012). In turn, knowledge of research methods should help students think more deeply about and better articulate strengths and weaknesses of research findings they encounter in organizations and life in general.

Second, we employ an innovative approach that promotes our students' understanding of EBMgt and its four components (i.e., formal research, local data, ethics and stakeholder concerns, and practitioner judgment) and allows them to practice applying their EBMgt knowledge to realistic scenarios using business cases. Specifically, we have adapted and integrated ideas from Dietz et al.'s (2014) approach that focuses on producing causally interpretable local evidence and Gamble and Jelley's (2014) recommendations for an EBMgt case competition

Figure 2. Pull Approach to EBMgt Education



Note: Figure taken from Barends et al. (2014, p. 4). Used with permission.

to design a case-based research proposal project. In preparation for this project, we use *The Bike Messenger Case,* also known as *The Rocket Cycles Case* (used with permission from case authors; see Dietz et al., 2014), as a "running" case that we return to periodically throughout the course. The primary objective of using this case is to show the importance of collecting local (organizational) data to inform managerial decision-making. We use *The Bike Messenger Case* most heavily during lectures on research design, measurement, and data collection. Typically, students are asked to form groups and spend 15-20 minutes applying a particular research methods topic to this case, followed by an instructor-led plenary session, online discussion forum, or both. We have found this to be an effective way to advance our students' critical thinking skills by challenging their assumptions and asking them to consider alternatives. That practice case builds on an "advertising claims" critical thinking exercise used to open the course (see Text Box 1), with corresponding pre- and post-course assessments of students' critical appraisals of everyday evidentiary claims (based on Adam & Manson, 2014).

The culmination of our BUS 2880 course is the case-based research proposal, which we introduce here but then provide a lot more information, including a sample case, project instructions, and grading criteria, in Jelley and Saksida, this volume. For this project, an instructor assigns students into groups of 4-5 members and asks them to analyze a short case written by BUS 2880 instructors and inspired by published field experiments or quasi-experiments. All groups must prepare a written research proposal using the same case. The case competition instructions and grading rubric outline how the case analysis requires students to critically

reflect on the four elements of EBMgt put forth by Briner et al. (2009). The top three teams, based on instructor and peer evaluations of the written submissions, are then invited to defend their research proposals to a panel of judges in the form of an in-class case competition. This permits the judges to ask challenging questions without seeming to be unreasonable and gives stronger student teams a better development opportunity (that generally seems to be appreciated) while serving as an eye-opener for audience members. Through the top-teams' presentations, the class comes to realize that the research process involves both rigour and creativity since no two proposals are identical. For their additional efforts to prepare for and participate in the presentation session, finalists receive extra marks on their group project.

While different from how cases are used in conventional business case competitions (see Gamble & Jelley, 2014, for a brief description), we offer that having students start with a practical problem conveyed through a case and asking them to apply EBMgt's versatile framework to examine the issues can better prepare them for evidence-based practice. This case-based project takes our students through a similar problem-solving cycle as the one described by Dietz et al. (2014) and modeled after problem-based learning in medicine (Barrows, 1996). Dietz et al. (2014) include further steps in their approach where students implement their study, collect and analyze data, and propose solutions to the case problem(s). The structure, pacing, and introductory nature of our semester-long BUS 2880 course prevent us from incorporating local evidence as fully into our course curriculum. Nevertheless, by having students develop a short research proposal as the focus of their recommendations, including the details of their study design and measurement, we can convey the importance of and challenges inherent in gathering local (organizational) evidence using methods that produce causally interpretable data.

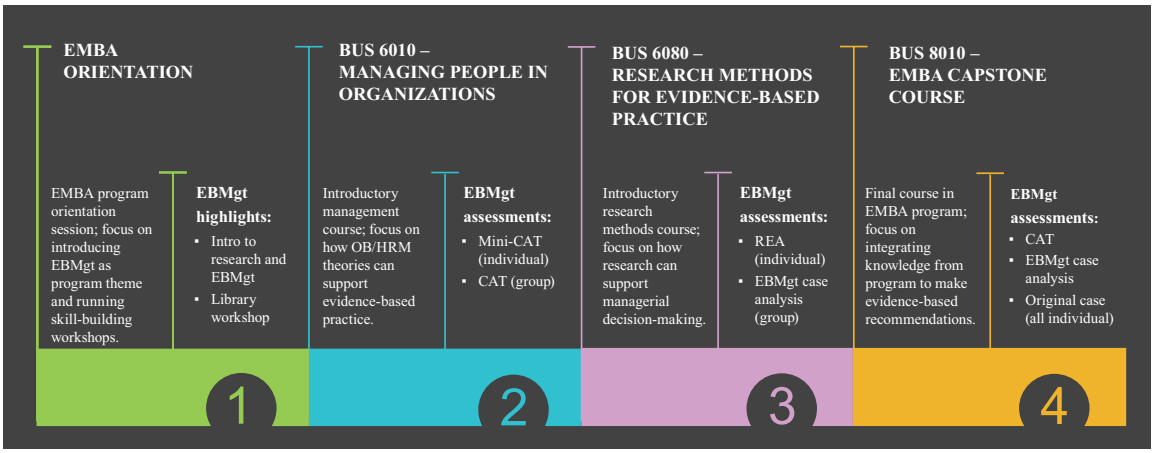
Text Box 1. "Advertising Claims" Exercise Instructions (based on Adam & Manson, 2014)

- Watch the following advertisement
  [instructor shows YouTube video of an infomercial selling an energy bracelet]
- Group work (10 minutes)
  1. Identify the claim(s) of the infomercial
  2. Identify evidence used as support for claim(s)
  3. Evaluate that evidence
  4. How could you test such claim(s)?
- Plenary discussion (15 minutes) and/or an online discussion forum concluded with a detailed debriefing post by the instructor
- A sample write-up is available from this chapter's second author upon request (bjelley@upei.ca)

EBMgt Education for (Executive) MBA Students

In an orientation session for the incoming EMBA cohort a few years ago, an alumna of that program said about her experience, "I would regularly take the material learned on Friday and apply it at work on Monday." This ability to immediately transfer newly acquired knowledge into the workplace is perhaps the major difference between our EMBA students and our undergraduate or even MBA-GL students, making EBMgt a more obvious fit for the more experienced group. Our EMBA students are mid-level career managers, entrepreneurs, or high-potential future leaders from varied educational and work backgrounds. On average, students have 10-15 years of work experience, including in supervisory roles. While the range of different backgrounds can create challenges for educators, it also presents us with a unique opportunity to have a widespread positive impact on managerial decision-making in a multitude of industries locally and beyond. And while EBMgt is the underlying theme of our EMBA program as a whole, it features most prominently in the courses described below (see also Figure 3 for a brief overview of those courses and their EBMgt-themed assessments).

Figure 3. Integration of EBMgt into UPEI's EMBA Program



Starting the Program

EMBA Orientation

Incoming students begin the program with an EMBA orientation. One of its core sessions introduces EBMgt, based largely on Barends et al.'s (2014) and Briner et al.'s (2009) definitions of EBMgt elements and processes. We also use items from the human resource management (HRM) content quiz from Rynes et al. (2002) to highlight the disconnect between management

research and practice. Our students tend to struggle with the quiz, but by framing their lack of evidence-based HRM knowledge as a dissemination failure by academics and within the context of Rynes et al.'s (2002) and Fisher et al.'s (2021) findings of widespread knowledge deficiencies among practicing professionals, we are able to demonstrate gaps in knowledge about practice-related management principles in a non-threatening way that mitigates potential reactions of defensiveness (Jelley et al., 2012). In addition, as part of the orientation, students attend a library workshop where a resident librarian exposes them to UPEI's library resources, academic literature searching, citation practices (with a particular focus on APA style), and the writing-enhancement platform Grammarly.

Introductory Management Course

Within weeks of the EMBA orientation, students are again introduced to EBMgt in their first course in the program – Managing People and Organizations (course code BUS 6010). Whereas this course focuses primarily on the push approach to EBMgt by advancing students' knowledge of HRM and organizational behaviour (OB) topics, it also provides valuable opportunities for developing skills associated with the pull approach to EBMgt. Specifically, two course assignments involve a Critically Appraised Topic (CAT), which is a "quick and succinct assessment of what is known (and not known) in the scientific literature about an intervention or practical issue by using a systematic methodology to search and critically appraise primary studies" (Barends et al., 2017b, p. 3).

Critically Appraised Topic (CAT). Compared to a systematic literature review, a CAT requires a less comprehensive literature search and is more limited in overall breadth and depth (Barends et al., 2017b), making it a better fit for students at this stage of the program. In BUS 6010, students first produce an individual "mini-CAT," focusing on only one academic article, and later conduct a more comprehensive CAT as a group project (see Text Box 2 for a sample of BUS 6010 group project CAT topics). Working on a CAT promotes students' skills in formulating answerable research questions, searching for relevant literature, appraising the quality of evidence, and synthesizing findings and their practical implications, which are considered essential to becoming an evidence-based manager (Barends et al., 2014). Therefore, while principally a management-content course, BUS 6010 is instrumental in laying the foundation for students to begin finding research relevant to their practice-related challenges and interests. The Barends et al. (2017b) CAT guideline has become a central resource for this project, complementing a previous instructor-developed template and, most recently, examples of similar (though more involved) reviews (e.g., CEBMa, 2020; Jelley, 2021).

Text Box 2. Sample BUS 6010 Group Project CAT Topics

- Does Teleworking Increase Employee Productivity?
- Is it Beneficial for Organizations to Implement an Employee Assistance Program?
- The Effects of Leadership Development on Leadership Outcomes
- The Impact of COVID-19 on Employees' Job Satisfaction
- The Impact of Employee Performance Appraisals on Organizational Performance
- The Impact of Union Membership on Employee Job Satisfaction

Graduate Research Methods and EBMgt

The BUS 6010 course described above is immediately followed by Research Methods for Evidence-Based Practice (course code BUS 6080), an introductory research methods course where students learn how to design and interpret research. By extensively incorporating EBMgt into several components of the course, we hope to instill in our students an appreciation for the complexity of research and the essential role it plays in evidence-based practice. As Jelley et al. (2012, p. 342) noted previously, "the EBMgt perspective seems to make research-methods content (reasonably) palatable to pragmatic students, and the research-methods content provides more of the knowledge and skill required to move students beyond a basic awareness of EBMgt." In recent years, this course has paired an introductory research methods textbook (Bougie & Sekaran, 2020) with select modules from CEBMa's online course offered through Carnegie Mellon University's Open Learning Initiative.

Rapid Evidence Assessment (REA). BUS 6080 students attend an advanced literature search workshop at the UPEI library as part of their first research methods class, which builds on their library orientation workshop and search experiences in BUS 6010. These skill-building experiences provide students with an important foundation for their work on the two major projects in this course. For one of those, students are required to conduct a scaled-down Rapid Evidence Assessment (REA), building on the skills acquired through the two CAT assignments in BUS 6010. Like a CAT, an REA includes an assessment of the current state of the literature on a particular topic by employing systematic methods to search for and appraise evidence (Barends et al., 2017a). To be quick and manageable (or "rapid"), an REA also makes concessions with regard to the thoroughness of the search. However, unlike a CAT, an REA is a bit more involved, as the search process is documented more thoroughly (e.g., in the form of a flow chart) and the included studies are evaluated for their methodological quality, not just appropriateness (Barends et al., 2017a). REAs also typically require that the search for relevant literature is conducted by two individuals independently of each other; we initially had our students work on this project in pairs but ended up abandoning that approach due to uneven student contributions and problems with free-riding. A sample of BUS 6080 individual REA topics is provided in Text Box 3.

Text Box 3. Sample BUS 6080 Individual Project REA Topics

- The Effect of High Stress Environments on Employee Morale
- The Effect of Open-Plan Offices on Employee Productivity
- The Impact of Flexible Work Arrangements on Career Advancement
- The Impact of Mentorship Programs on Mentor Subjective Career Outcomes
- The Impact of Non-Standard Work Schedules on Work-Life Balance
- The Impact of Nurse Staffing on Quality-of-Care Outcomes in Nursing Homes: A Rapid Evidence Assessment

Given their emerging familiarity with research methods and lack of experience with evidence synthesis, our EMBA students tend to struggle with the REA assignment, which has prompted instructors to provide increasingly more guidance. Coming up with an answerable (and manageable) question appears to be a major stumbling block for many students, so we have added a peer feedback session, facilitated by the course instructor, where students brainstorm question ideas following the PICOC approach (e.g., Barends et al., 2017a; Briner et al., 2009; Briner & Walshe, 2014) to focus their question. Shortly after this session, students are now required to submit an early draft of the paper, ending with the question formulation stage, for instructor feedback and approval. In terms of published resources, students in this course are provided with Barends et al.'s (2017a) REA guide and Briner and Walshe's (2014) article on teaching systematic review skills; in recent years, they have also been assigned Jelley's (2021) REA on work-related personality-feedback interventions which provides them with a helpful exemplar to follow. In addition to the published article, students may also consult and discuss an unpublished manuscript version (like their APA-style papers) and notes from Jelley's (2021) PICOC exploration process (see Appendix B). Application of the PICOC led to Jelley's (2021) "personality-feedback intervention" terminology that reflects the longstanding practice of providing respondents of standardized, self-report measures with personality feedback as a development intervention. The PICOC helped clarify other aspects of that REA, too, such as its focus on workplace or work-related education contexts and the exclusion of clinical or therapeutic samples (Jelley, 2021).

Despite these added supports, instructors have found that the final products end up being only rough approximations of what an REA should be. The supporting documents seem to primarily help with the general organization of the paper, the documenting of the literature search process (in-text and in tables and flow charts), and the data extraction table. Some areas where students still struggle considerably are generating a researchable (and manageable) question, conducting a systematic and (relatively) exhaustive literature search, writing a concise yet coherent synthesis of the literature, and assessing the methodological

appropriateness of the included studies. In recent years, additional supports from the course instructor (e.g., more extensive feedback in the question-generation phase and on paper drafts) and a university librarian (e.g., voluntary one-on-one sessions in the literature search phase) have improved but not entirely alleviated these issues. Still, like Briner and Walshe's (2014) approach, this assignment meets our goals of providing training in general skills required to conduct systematic reviews and highlighting the importance of such reviews for evidence-based practice. Understanding the challenges and effort involved in a systemic approach to research synthesis may also enhance appreciation of reviews that others have produced. When an EMBA alumna noted that meta-analyses had become her favourite reading material, her explanation reflected gratitude and relief related to the work involved in producing research syntheses with actionable insights – notably that she could use the information without personally conducting the review.

EBMgt Case Analysis. Like the research methods and EBMgt course in our BBA program (BUS 2880; described above), BUS 6080 also concludes with a case-based research proposal project and in-class case competition, since the short (six-week) duration of the course would not allow our students to see a research project through from start to finish. This project is structured similarly to the one in the undergraduate program, except that we use a published (typically Ivey or Harvard) case, which introduces more complexity, requires more extensive literature searches, and creates more ambiguity (and options) when it comes to the research design for the proposed study. Due to the smaller class size and more engaged students (compared to BUS 2880), all groups present in the in-class competition; unlike in BUS 2880, the groups' written reports are due after their presentations, with the instructor providing them with same-day verbal presentation feedback that they can incorporate into their reports. This approach was initially employed due to the compressed nature of this course (i.e., four all-day classes every other Friday or Saturday), but it also tends to result in higher quality written submissions. EMBA students have more advanced mental models about management (Jelley et al., 2012), so we also hold them to a higher standard in terms of their performance on the written submission and presentation, and the difficulty of the questions posed by the competition judging panel. Experiences with fielding questions in Q&A sessions following the team presentations (CAT in BUS 6010; EBMgt case competition in BUS 6080) also provide students with opportunities for repeated practice, and in the case of the BUS 6080 competition, a preliminary look at what they can expect in the EMBA Capstone Course at the end of the program.

Completing the Program

Signature Project

Since 2017, our EMBA students have had the option to finish the program either by completing the traditional Signature Project (a thesis-like project), which has been around since the program's inception, or the newer EMBA Capstone Course. Both options are equivalent to two EMBA courses and are designed to have students apply and further refine the knowledge and EBMgt skills acquired in the program's core courses. Most students now opt for the Capstone Course, but the Signature Project remains a good choice for those who have a keen interest in a particular topic and wish to work on a sizeable project independently, under the supervision of a faculty advisor. The Signature Project can take three forms: academic business research, business plan, or consulting-type project. Of the three, academic business research requires students to draw most heavily on their research and EBMgt skills. Whereas some students have conducted primary research for their academic research projects, systematic literature reviews have been the most popular choice historically; in reality, though, the final products have usually resembled a CAT or an REA more than a full systematic review. Because the EMBA Capstone Course (described below) includes a CAT as one of its three projects, students wishing to conduct a systematic literature review as a Signature Project are now directed to take that course unless they can show that their project would be sufficiently substantial and rigorous to warrant a standalone project.

EMBA Captstone Course

The Capstone Course builds on our experience with case-based research proposals and variants of the systematic literature review (i.e., CAT and REA) in other EMBA courses, resulting in an intensive and challenging course that explicitly integrates EBMgt into all its components. Participating students must have first completed all other EMBA courses, although exceptions have been made in rare cases. This course is co-taught by two instructors from different business disciplines to ensure better coverage of topic areas and analytical tools. Students are required to complete three EBMgt-themed projects, spaced out evenly over their final semester in the program; each project takes five weeks to complete and consists of a written report and a presentation (the course timeline is described in more detail further below).

Project 1 (CAT). The first project is a CAT where students need to narrow down a management topic of their choice to an answerable question and critically appraise relevant findings from formal research. We encourage students to pick a topic that is directly relevant to their work or is one that they would like to explore further as part of their original case assignment later in the course. The students are provided with extensive supports, including Barends et al.'s (2017b) CAT guide, Briner and Walshe's (2014) piece on teaching systematic review skills, and Jelley's (2021) published REA as an exemplar. Because the Capstone Course is not

a research methods course, the students are asked to produce a CAT, which requires less of a methodological assessment of the included studies than an REA. Perhaps surprisingly, out of the three Capstone projects, we find that students struggle with this one the most, despite opportunities for repeated practice (i.e., previous CAT and REA assignments in the EMBA program) and a feedback session early in the project's timeline (more on this below).

Project 2 (EBMgt Case Analysis). Project 2 is similar to the case-based research proposal project used in our undergraduate (BUS 2880; see also Jelley & Saksida, this volume) and EMBA (BUS 6080) research methods courses, in that it requires students to critically reflect on the four elements of EBMgt as part of their case analysis and make evidence-based recommendations. Like in BUS 6080, the students are again assigned a published case (see Text Box 4), with students in a particular competition group working with the same case (more on this below). However, this project differs from other iterations in three important ways. First, the Capstone students complete this project individually, not as part of a team. Second, there are usually three or four different competition groups, with each assigned a different case, which means that collectively students get to cover a wider range of business topics. These topics usually match the two course instructors' areas of expertise – one in management (this chapter's first author) and the other in strategy and international business. Third, whereas the project instructions encourage students to propose further research as part of their recommendations, this part is not as prescriptive as in BUS 2880 or BUS 6080, giving students more latitude in how they tackle the case. While still putting considerable emphasis on EBMgt and the importance of producing local evidence, this approach recognizes that the Capstone Course is not primarily a test of the students' research methods skills, but a culmination of everything they learned in the program. In other words, this project functions more like a hybrid between a traditional case analysis and an EBMgt case analysis, with students applying theories and tools they had learned in other courses – for example, they might use Porter's Five Forces framework (Porter, 1979) to analyze a strategy case – while also explicitly considering research evidence, local data, ethics and stakeholder concerns, and practitioner judgment in their analysis and recommendations.

Project 3 (Original Case). The Capstone's final project is an original case, where students are tasked with authoring an EBMgt-themed case, along with a teaching note, that could potentially be used as a teaching tool in an undergraduate or MBA course. This project provides students with opportunities to assume various roles, including researcher, interviewer, writer, and educator. They can choose to write a *company field case* done with the cooperation of an organization with which they have ties (e.g., employer, personal connection), a *general experience (or fictitious) case* that involves issues that the student wishes to examine, possibly inspired by issues that they have seen or experienced, or a *published information case* that is derived from publicly available information, such as news reports, annual reports, and journals (see Text Box 5 for a sample of past students' original case titles). The students' written

Text Box 4. Applying the EBMgt Framework to Published Business Cases

Finding published cases that contain enough information to allow for an EBMgt analysis and can serve as a foundation for proposing further research (i.e., a research proposal as part of the case recommendations) has been a difficult task. Some stand-out examples of existing cases that are conducive to this type of project include Agilus Work Solutions: Back to the Office? (Ivey No. W31126), C&S Wholesale Grocers: Self-Managed Teams (HBS No. 9-404-025), L'Oréal S.A.: Rolling Out the Global Diversity Strategy (Ivey No. 9B10C026), and The Treadway Tire Company: Job Dissatisfaction and High Turnover at the Lima Tire Plant (HBS No. 2189). The instructors have typically assigned Ivey or Harvard cases but have also occasionally drawn on other publishers (e.g., Case Research Journal, North American Case Research Association). The first author of this chapter has compiled a list of all the published cases used in the EMBA Capstone Course to date and is happy to share it with interested EBMgt educators upon request.

Text Box 5. Sample BUS 8010 (EMBA Capstone Course) Original Case Titles

Company Field Cases:

- [Company]: Rapid Growth in a Global Pandemic
- [Company]: The Cost of Recycling
- Making the Most of Trade Shows: An Event Intelligence Strategy for [Company]
- Victory or Valhalla: [Company] Goes to Norway

General Experience (fictitious) Cases:

- Desert Energies: Navigating the Cloud Dilemma
- Generational Knowledge Transfer: A Case Study in Talent Management
- Senior Living Inc: Closing the Gender Leadership Gap
- The Great Aluminum Rush: Supply Chain Considerations for an Emerging Craft Company

Published Information Cases:

- Avon: Strategic Revival or Finale
- Boeing: The Crash of a Giant
- Cannabis or Cannabust: Is PEI Cannabis Corp Viable?
- Crisis Management: Can Princess Cruises Stay Afloat?

submission includes two elements – the case itself and the teaching note. The case is meant to follow the typical format of a published business case, with sections that introduce the protagonist(s), describe the organizational context, provide information on key issues, and articulate the dilemma and the decisions that need to be made. The teaching note is intended to provide guidance to the (hypothetical) instructor who has assigned the case, including learning objectives, theories and analytical tools students should apply or learn when analyzing the case, and suggested questions and discussion points for class discussion.

The original case assignment is different from anything else our students encounter in the EMBA program, so we provide them with extensive supports, including published guidelines on developing a teaching case (Roberts, 2012) and detailed project instructions and grading rubrics. But while the general structure of the case and the teaching note follows established practice, what makes this project unique to our program is that students are asked to incorporate the four elements of EBMgt into both. This aspect of the project has proven to be quite challenging, with students often applying the EBMgt framework in a somewhat "forced" or ad hoc manner, so our approach here continues to evolve. The case itself has been less problematic, since relevant research findings (or hints to relevant bodies of literature), local data, stakeholder concerns, and information about the protagonist(s) can be organically interwoven into the case with relative ease. For example, a past student's company field case on event intelligence gathering at trade shows featured a protagonist – the company's marketing manager who was completing their EMBA degree – who identified relevant research findings and industry data and reflected critically on local data presented in the case, including the company's past spending on trade shows in the absence of any meaningful return-on-investment considerations. The case also included mentions of key stakeholders like the company CEO, a sales manager often tasked with attending trade shows, and a multinational company holding a significant stake in the company, and a discussion around the ethics of competitive intelligence gathering vs. industrial espionage.

The teaching note, on the other hand, has presented more of a challenge, with the EBMgt angle often relegated to a single discussion point. To try and bring EBMgt front and centre, recent iterations of the Capstone Course have instructed students to think of the teaching note as *a roadmap to teaching EBMgt,* as opposed to the specific issue(s) in a given case. In other words, the primary purpose of both the case and the teaching note is to enable the (hypothetical) instructor to teach the concept of EBMgt in class; the specific topic of a particular case only plays a supporting role. This added clarification seems to have made a positive albeit modest difference. Still, despite some of these growing pains, the original case project tends to be the most popular of the three Capstone projects, making for a fitting course (and program) finale.

Timeline and In-class Competition. For each of the three Capstone projects, students are assigned into competition groups (typically 3-4 students per group); each group is supervised by one of the course instructors. For Project 1 (CAT), students are (loosely) grouped together

based on their CAT topic, with the instructors supervising the groups that best match their areas of expertise. For Projects 2 and 3, students are put into competition groups in a way that minimizes repetition with other students while also ensuring that every student has been supervised by each instructor at least once. Early on in a given project, the class gets together for a peer feedback session where students receive verbal feedback from peers outside of their competition group on preliminary ideas or even early project drafts, with some input from the course instructors. About midway into a project, students submit a draft of their paper to their assigned instructor and receive written feedback prior to finalizing their written report. Students then submit their final paper a few days before delivering their presentation, which concludes their work on a project. Figure 4 presents a detailed course timeline, excerpted from the Winter 2024 offering of the EMBA Capstone Course (Saksida & Wagner, 2024).

Figure 4. EMBA Capstone Course Timeline (from Saksida & Wagner, 2024)

Orientation Session	January 6, 9am-12pm
Project #1	
Feedback session	January 13, 9am-12pm
Written draft to the instructor	January 24-28
Written report due date	February 4 (end of day)
Presentations	February 9, 12-6pm
Project #2	
Feedback session	February 24, 9am-12pm
Written draft to the instructor	February 28-March 3
Written report due date	March 10 (end of day)
Presentations	March 15, 12-6pm
Project #3	
Feedback session	April 1, 5-8pm
Written draft to the instructor	April 3-7
Written report due date	April 14 (end of day)
Presentations	April 19, 12-6pm

The project presentations are done in the form of an in-class competition. Students within a given competition group compete against one another. These within-competition-group matches take place in front of fellow students beyond the competition group and a panel of judges, consisting of one of the course instructors, another McDougall faculty member, and an EMBA graduate. The panelists' evaluations determine the winner of the match. At the end of the course, the student with the most "wins" is declared the winner of the overall

competition. This competition aspect was initially incorporated into the course as a fun way to engage the students and our alumni. We have found that our students enjoy the challenge and are genuinely excited and proud when they win their matches. Thankfully, defeats are not usually crushing but are generally seen as part of a good-natured sharing and learning process.

Developing Evidence-Based Practitioners

In this section, we synthesize our EBMgt educational efforts by reflecting on how the courses described above promote our students' knowledge of and appreciation for the four elements of EBMgt put forth by Briner et al. (2009). Our other chapter in this book provides a more extensive reflection on the case-based research proposal project, one of the cornerstones of our approach to EBMgt education (see Jelley & Saksida, this volume).

Formal Research

Our efforts centre heavily on this component of EBMgt. All the initiatives described in the preceding sections, but particularly BUS 6010 (EMBA management course), BUS 6080 (EMBA research methods course), and the EMBA Capstone Course, strongly emphasize the importance of evidence search and appraisal skills. We go to great lengths to help our students develop those skills through library literature search workshops, course assignments (e.g., CAT, REA, EBMgt-themed case projects), and research methods training that promotes the "best available evidence" mentality (Barends et al., 2014; Briner et al., 2009) that is central to evidence-based practice. In her introduction to *The Oxford Handbook of Evidence-Based Management,* a key resource for EBMgt scholars, educators, and practitioners, Rousseau (2012, p. 5) advanced that "knowing how to obtain and use scientific evidence and reliable business knowledge helps practitioners respond effectively to the uncertainty they face everyday in organizations." By teaching our students how to find, assess, and apply research evidence, we hope to equip them with the skills they will need to make informed decisions in the workplace.

Most of the courses described in this chapter, except for BUS 6010, revolve heavily around the pull approach to EBMgt (i.e., the skills required to acquire, critically assess, synthesize, and apply evidence), but evidence-based practitioners should also possess basic knowledge of research findings in their area of practice (Rousseau, 2012). This is where our undergraduate and EMBA course offerings as a whole play a key role. While we cannot claim that all our colleagues share our interest in EBMgt education, we can say with some degree of confidence that many of our undergraduate and EMBA courses effectively employ the push approach to EBMgt education by advancing students' knowledge of relevant theories and research findings in a particular business domain. Moreover, it appears that our EBMgt efforts in the courses described in this chapter create a demand for evidence-based content among our students. It is not uncommon for us to hear that, after taking courses like BUS 2880, BUS

6010, or BUS 6080, students actively challenge assumptions and look for evidence derived from formal research in their other courses; this is particularly evident in the EMBA program, with students mentioning in the program exit survey that certain courses should be "updated with more current/relevant information" or lamenting that some instructors did not "follow EBMgt principles" or "emphasize research enough" in their courses.

Local Data

This EBMgt component refers to the local context within which managerial decision-making takes place. Local data can refer to various organizational metrics for assessing the financial health of the organization or other factors, including employee perceptions and attitudes, that impact organizational performance (Barends et al., 2014; Rousseau, 2012). Whereas other core business courses (e.g., accounting, finance, management science) in our programs equip students with the skills to identify relevant organizational data and transform them into useful business information (Rousseau, 2012), our efforts in this area focus primarily on our students' ability to produce local evidence or partner with researchers in that endeavour. Our research methods courses, in particular, introduce our students to the basics of research design, measurement, and analysis and help them develop causal reasoning skills. They are then asked to apply this knowledge in our case-based projects in BUS 2880, or in BUS 6080 and the EMBA Capstone Course. Following Dietz et al. (2014), we believe that requiring our students to propose field studies, with well-thought-out research proposals, is a meaningful endeavour, as "producing local evidence is a managerially useful complement to existing evidence when the latter is not sufficiently relevant to the problem at hand, lacks causal interpretability, or cannot be locally applied" (p. 400). Our approach to teaching EBMgt thus encourages students to become savvy consumers *and* producers of research (Dietz et al., 2014; Jelley et al., 2012).

Ethics and Stakeholder Concerns

Practicing ethical decision-making involves paying attention to the interests of stakeholders impacted by the decision or organizational action (Rousseau, 2012). The management course in our EMBA program (BUS 6010) includes content relevant to moral reasoning and action planning. In addition to discussing the importance of exploring the ethical implications of managerial decisions in-class, we explicitly incorporate this element of EBMgt into our case-based projects in the courses discussed in this chapter. As part of their EBMgt case analysis in the BBA and EMBA research methods courses (BUS 2880 and BUS 6080) and the two case-based projects in the EMBA Capstone Course, our students are required to consider the perspectives of all stakeholders affected by the decision and critically reflect on any moral, legal, or values-based concerns related to the case.

We complement considerations of ethical decision-making with a discussion of research ethics. Specifically, in BUS 2880 and BUS 6080, we introduce our students to the basic principles of research ethics, drawing on the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS 2; Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & Social Sciences and Humanities Research Council of Canada, 2022) and other relevant materials. Students are expected to apply these principles when proposing further research as part of their case-based projects in BUS 2880, BUS 6080, and the EMBA Capstone Course. Moreover, we require EMBA students whose Signature Projects involve data collection from human participants to complete the *TCPS 2 Tutorial Course on Research Ethics,* regardless of whether they intend to publish their research or not, as a pre-requisite to the submission of their ethics protocol. Taken together, our intent is to emphasize practitioners' professional obligation to engage in fair, ethical, and responsible decision-making (Rousseau, 2012).

Practitioner Judgment

Management is about making organizational decisions; an evidence-based approach to management requires developing one's ability to make reflective, thoughtful decisions (Rousseau, 2012). Managerial decision-making is one of the topics that BUS 6010 has touched on, including considerations of the system one (fast, automatic) versus system two (slow, deliberate, effortful) decision-making simplification (e.g., Kahneman, 2011). That unit has also included an assigned reading (Kahneman & Klein, 2010) and in-class discussion to encourage students to reflect critically on trusting one's gut, given that the conditions needed to develop skilled intuition based on personal experience are elusive in management. We hope to instill both a deliberate approach to decision-making and *a priori* learning to inform students' managerial intuition (Kahneman & Klein, 2010) based on evidence-informed principles. Our EBMgt offerings as a whole are intended to develop our students' judgment to be more conscious, thoughtful, and reflective. Through lectures, activities, class discussions, and assignments, we teach our students to be aware of their decision-making processes and biases and to carefully reflect on but not overvalue their own experience. We are particularly focused on developing our students' critical thinking skills, which are central to evidence-based practice. In essence, EBMgt combines critical thinking with using the best available research evidence and business knowledge (Rousseau & Barends, 2011). Our EBMgt courses promote critical thinking by encouraging students to actively devote attention to their thinking, question and test assumptions, explore alternatives, and be thorough in their analysis of practical matters (Rousseau, 2012).

Conclusion

The courses described in this chapter have been designed to equip our students with a thorough understanding of EBMgt principles and critical thinking and research skills that should translate to better decision-making in the workplace. Our EBMgt efforts have generally been well-received, but appear to have been particularly impactful in the EMBA program; for instance, in exit surveys and alumni testimonials, our EMBA graduates repeatedly cite their appreciation for evidence-based practice as the key takeaway from the program. Unfortunately, as discussed earlier in the chapter, several factors have recently compelled us to suspend intake in the EMBA program, which introduces some uncertainty into our future offerings and the program's long-term viability. Still, given our past successes with this approach, and possibilities for enhanced integration in BBA and MBA-GL programs, we are convinced that EBMgt will feature prominently in whatever our next chapter might be.

References

Adam, A., & Manson, T. M. (2014). Using a pseudoscience activity to teach critical thinking. *Teaching of Psychology*, *41*(2), 130-134.

Antonakis, J., Fenley, M., & Liechti, S. (2011). Can charisma be taught? Tests of two interventions. *Academy of Management Learning & Education*, *10*(3), 374-396.

Barends, E. (2012). The 5-step pull approach. In E. Barends, D. M. Rousseau, W. R. Carroll, & R. B. Jelley, *Evidence-Based Management: Three New Approaches to Teaching the Practice of Management.* Professional Development Workshop at the Annual Conference of the Academy of Management. Boston, MA.

Barends, E., & Rousseau, D. M. (2018). *Evidence-based management: How to use evidence to make better organizational decisions* (1st ed.). Kogan Page.

Barends, E., Rousseau, D. M., & Briner, R. B. (2014). *Evidence-based management: The basic principles*. Center for Evidence-Based Management.

Barends, E., Rousseau, D. M., & Briner, R. B. (2017a). *CEBMa guideline for rapid evidence assessments in management and organizations* (version 1.0). Center for Evidence-Based Management.

Barends, E., Rousseau, D. M., & Briner, R. B. (2017b). *CEBMa guideline for critically appraised topics in management and organizations* (version 2.0). Center for Evidence-Based Management.

Barling, J. (2014). *The science of leadership: Lessons from research for organizational leaders*. Oxford.

Barling, J., Weber, T., & Kelloway, E. K. (1996). Effects of transformational leadership training on attitudinal and financial outcomes: A field experiment. *Journal of Applied Psychology*, *81*(6), 827-832.

Barrows, H. S. (1996). Problem-based learning in medicine and beyond: A brief overview. *New Directions for Teaching and Learning, 68,* 3-12.

Bougie, R., & Sekaran, U. (2020). *Research methods for business: A skill-building approach* (8th ed.). Wiley.

Briner, R. B., Denyer, D., & Rousseau, D. M. (2009). Evidence-based management: Concept cleanup time? *Academy of Management Perspectives, 23*(4), 19-32.

Briner, R. B., & Walshe, N. D. (2014). From passively received wisdom to actively constructed knowledge: Teaching systematic review skills as a foundation of evidence-based management. *Academy of Management Learning & Education, 13*(3), 415-432.

Burke, L. A., & Rau, B. (2010). The research-teaching gap in management. *Academy of Management Learning & Education, 9*(1), 132-143.

Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & Social Sciences and Humanities Research Council of Canada. (2022). *Tri-council policy statement: Ethical conduct for research involving humans.* Government of Canada.

Center for Evidence-Based Management. (n.d.). *Universities and business schools that offer courses where elements of EBM are taught.* https://cebma.org/teachers-network/universities/

Center for Evidence-Based Management. (2020, May). *Attributes of effective virtual teams: Rapid evidence assessment of scientific literature* [Technical report]. Center for Evidence-Based Management and Chartered Institute of Personnel and Development.

Charlier, S. D., Brown, K. G., & Rynes, S. L. (2011). Teaching evidence-based management in MBA programs: What evidence is there? *Academy of Management Learning & Education, 10*(2), 222-236.

Dietz, J., Antonakis, J., Hoffrage, U., Krings, F., Marewski, J. N., & Zehnder, C. (2014). Teaching evidence-based management with a focus on producing local evidence. *Academy of Management Learning & Education, 13*(3), 397-414.

Fisher, P. A., Risavy, S. D., Robie, C., Konig, C. J., Christiansen, N. D., Tett, R. P., & Simonet, D. V. (2021). Selection myths: A conceptual replication of HR professionals' beliefs about effective human resource practices in the US and Canada. *Journal of Personnel Psychology, 20*(2), 51-60.

Gamble, E. N., & Jelley, R. B. (2014). The case for competition: Learning about evidence-based management through case competition. *Academy of Management Learning & Education, 13*(3), 433-445.

Graduate Management Admission Council. (2022). *Application trends survey: 2022 summary report* [Market Intelligence]. October. https://files.eric.ed.gov/fulltext/ED626736.pdf

Graen, G. B. (2009). Educating new management specialists from an evidence-based perspective: A proposal. *Academy of Management Learning & Education, 8*(2), 255-258.

Jelley, R. B. (2024). *BUS 2880: Research and Evidence-based Management* [Syllabus]. University of Prince Edward Island.

Jelley, R. B. (2021). Using personality feedback for work-related development and performance improvement: A rapid evidence assessment. *Canadian Journal of Behavioural Science, 53*(2), 175-186.

Jelley, R. B., & Carroll, W. R. (2012). Teaching EBMgt: The "push" approach. In E. Barends, D. M. Rousseau, W. R. Carroll, & R. B. Jelley, *Evidence-Based Management: Three New Approaches to Teaching the Practice of Management.* Professional Development Workshop at the Annual Conference of the Academy of Management. Boston, MA.

Jelley, R. B., Carroll, W. R., & Rousseau, D. M. (2012). Reflections on teaching evidence-based management. In D. M. Rousseau (Ed.), *The Oxford Handbook of Evidence-Based Management* (pp. 337-355). Oxford University Press.

Kahneman, D. (2011). *Thinking, fast and slow*. Macmillan.

Kahneman, D., & Klein, G. (2010). When can you trust your gut? *McKinsey Quarterly*, *2*, 58-67.

Kelloway, E. K., & Barling, J. (2000). What we have learned about developing transformational leaders. *Leadership & Organization Development Journal*, *21*(7), 355-362.

Kline, R. B. (2009). *Becoming a behavioral science researcher: A guide to producing research that matters.* Guilford Press.

Pedzahur, E. J., & Schmelkin, L. (1991). *Measurement, design and analysis: An integrated approach.* Lawrence Erlbaum.

Porter, M. E. (1979). How competitive forces shape strategy. *Harvard Business Review, 57*(2), 137-145.

Pritchard, R. D., Harrell, M. M., DiazGranados, D., & Guzman, M. J. (2008). The productivity measurement and enhancement system: A meta-analysis. *Journal of Applied Psychology, 93*(3), 540-567.

Roberts, M. J. (2012). *Developing a teaching case (abridged).* HBS No. 9-901-055. Harvard Business School Publishing.

Rousseau, D. M. (2006). Is there such a thing as "evidence-based management"? *Academy of Management Review, 31*(2), 256-269.

Rousseau, D. M. (2012). Envisioning evidence-based management. In D. M. Rousseau (Ed.), *The Oxford Handbook of Evidence-Based Management* (pp. 3-24). Oxford University Press.

Rousseau, D. M., & Barends, E. (2011). Becoming an evidence-based HR practitioner. *Human Resource Management Journal, 21*(3), 221-235.

Rousseau, D. M., & McCarthy, S. (2007). Educating managers from an evidence-based perspective. *Academy of Management Learning & Education, 6*(1), 84-101.

Rubin, R. S., & Dierdorff, E. C. (2009). How relevant is the MBA? Assessing the alignment of required curricula and required managerial competencies. *Academy of Management Learning & Education, 8*(2), 208-224.

Rynes, S. L., & Bartunek, J. M. (2017). Evidence-based management: Foundations, development, controversies and future. *Annual Review of Organizational Psychology and Organizational Behavior,* 4, 235-261.

Rynes, S. L., Colbert, A. E., & Brown, K. G. (2002). HR professionals' beliefs about effective human resource practices: Correspondence between research and practice. *Human Resource Management, 41*(2), 149-174.

Rynes, S. L., Rousseau, D. M., & Barends, E. (2014). From the guest editors: Change the world: Teach evidence-based practice! *Academy of Management Learning & Education, 13*(3), 305-321.

Saksida, T., & Jelley, R. B. (2018). A decade of teaching evidence-based management: Initiatives and future directions. *Workplace Review*, *April*, 103-120. https://www.smu.ca/webfiles/April2018.pdf

Saksida, T., & Wagner, D. M. (2024). *BUS 8010: Business Research in Practice* [Syllabus]. University of Prince Edward Island.

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Appendix A

BUS 2880 Course Schedule (adapted from Jelley, 2024)

DATE	UNIT	TOPIC	READINGS, ETC (SEE ALSO MOODLE)
January 8	1	Baseline Assessment Welcome! (introduction & course overview) Self-Introduction Post	
10	2	Introduction to Research and EBMgt	Ch. 1* & Barends et al. (2014)
15	3	Research Ethics	TCPS 2 (2018) as assigned on Moodle
17	4	The Scientific Approach	Ch. 2
22	5	Problem Definition & Research Questions	3 & 4
24		**Test 1** (in-person during class time)	
25 stand-alone unit opens	ERUL	Effective and Responsible Use of Literature ERUL Quiz due near the end of the course	Ch. 5 + materials on Moodle (not covered on Test 2, just ERUL Quiz)
29	6	Theoretical Framework and Hypotheses	Ch. 6
31	7	Research Design	Ch. 7 Rocket Cycles case
February 5	8	Experimental Designs	Ch. 11
7	9	Sampling	Ch. 14
12	10	Measurement of Variables	Chs. 12 & 13
14		**Test 2** (in-person during class time)	
19-23		No Classes – Mid-Semester Break Recommendation: *Complete ERUL Quiz* Project case to be released (individual work)	

continued

DATE	UNIT	TOPIC	READINGS, ETC (SEE ALSO MOODLE)
26	11	Data Collection Methods I	Chs. 8 & 9
28	12	Data Collection Methods II	Ch. 10
Early March		Project teams to be formed	Drop deadline Feb. 29
March 4	13	Quantitative Data Analysis I	Ch. 15
March 6	14	Quantitative Data Analysis II	Ch. 16
11	15	Quantitative Data Analysis III	
13	16	Qualitative Data Analysis	Ch. 17
18	17	Conclusions and The Research Report	Chs. 18 & 19
20		**Test 3** (in-person during class time)	
22		**ERUL Quiz Deadline**	
25		Project Work (in-class consultations)	
27		*Optional* – Project Work and Consultations (attendance at your team's discretion)	
April 1		No Classes	
3	18	Course Recap and Evaluation	
3		**Submit Team Project**	Project due no later than **3:00 pm on April 3**
6		Due – Finalist nomination votes	No later than 3:00 pm on April 6
8	19	**Case Competition** (Finalists' Session – all students to attend)	Finalists to be announced by April 7
12		(Within-team) Peer Evaluations due	
Date and time to be set by the Office of the Registrar		**Final Exam (cumulative)**	Covers the entire course

**The textbook for this course is Bougie and Sekaran (2020).*

Appendix B

PICOC for Jelley's (2021) REA

PICOC for Jelley's (2021) REA

PICOC Element	Application to the Jelley Personality-Feedback Intervention (PFI) Rapid Evidence Assessment REA NOTE: Working with the PICOC was an important part of clarifying the nature and term that was chosen (i.e., PFI).
Population:	Adult humans in a workplace context or engaged in work-related education or development; primary focus on individuals with secondary attention to applications at other levels of analysis (e.g., team)
Intervention:	Personality feedback (PF), personality-based feedback, or like terms to describe programs or products that involve the sharing of results based on participants' completion of a standardized self-report personality questionnaire (test, inventory, measure, scale, assessment, indicator, instrument, or equivalent)
Comparison:	Main comparison: No personality feedback or placebo (e.g., non-individualized feedback) condition [e.g., independent variable, PF = yes (intervention) vs. no (comparison)] Other possibilities: • Pre-post comparisons of personality feedback interventions • Comparisons between PF and other interventions • Coaching as another variable (possible moderator): e.g., No PF vs. PF vs. PF+coaching [or 2 (PF: no vs. yes) X 2 (coaching: no vs. yes)] • Relative effects of different questionnaires, theoretical perspectives, psychometric quality, test-construction approaches, etc. (possible moderators)
Outcome(s):	Primary: Measures of behaviour, performance, or learning Secondary: Various intended and unintended effects (positive or negative) on, for example, participant reactions and attitudes like satisfaction, perceived utility, self-acceptance, goal setting; qualitative data of stakeholder's lived experiences with personality-based feedback
Context:	No restrictions on sector or geographic location; non-clinical, non-therapeutic samples

Note: If/when sharing this example of Jelley's (2021) PICOC exploration process with students, this chapter's second author suggests the following disclaimer: "This is not a concise application of the PICOC. It is an example of how Jelley (2021) used this tool to clarify his thinking about an REA project and associated search terms, inclusion criteria, etc. The PICOC tool is meant to help you conduct the REA; the tool itself should not be the focus."

Integrating Evidence Based Management & Data Analytics in Executive MBA & Post-Experience Masters Programmes

Claire Gubbins

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Integrating Evidence Based Management & Data Analytics in Executive MBA & Post-Experience Masters Programmes

Claire Gubbins

This chapter discusses various strategies and methods used to integrate evidence-based management to various post-experience Masters programmes (including Masters in Strategic Learning & Development, Masters in Work & Organisational Psychology, Graduate Certificate in Strategic Leadership, Masters in Human Resource Management) and Executive MBA's. The depth at which evidence-based management content is covered varies across the programmes but the strategies and methods used and discussed here are broadly similar in all cases aside from the amount of time allocated to each element depending on the programme. I provide evidence why and how our strategies are appropriate or effective. To share my experiences, I include examples of course content, assessments, assessment topics, links to material to include in course content and a pre/post-test for module/programme evaluation. In doing so, I also discuss the key challenges encountered by students in developing their evidence-based practice skills and provide illustrative feedback on module/programme content from students, external evaluators and external examiners.

Bringing Evidence Based Management Education to Dublin City University Business School

Dublin City University (DCU) Ireland's strategic objectives include to "*Provide a transformative student experience", "optimising the employability of our graduates*" and *"DCU is a University of Enterprise- industry engagement with be a hallmark of our activities"*. My *EBM*

approach in teaching post-experience students aligns with these objectives. My EBM teaching journey began after I was asked to be the Director of DCU Business School's Executive MBA programme in 2014 and assigned a module entitled Managing People and Organisations. The DCU Executive MBA attracts post-experience participants typically in mid to senior management positions, with on average 7+ years management experience, who possess an honours degree, usually in a technical area, some with Masters qualifications, and seeking to progress to senior levels. I conducted some research and an evaluation of the existing programme and combined this with AMBA (Association of MBA's accreditation body) feedback, which highlighted opportunities to further develop the programme. I identified three key challenges.

Three Challenges

1. The first challenge pertains to engaging students in reading scientific articles and extracting and recognising the value of science to their practice. Many students find reading scientific articles difficult and furthermore see it as an exercise required for university assignments beyond which it will not be required again. This issue is well recognised given calls to improve the readability of scientific articles (Gubbins & Rousseau, 2015) through using words familiar to practitioners (Bartunek & Rynes, 2010) and translating the results of research into a language that makes implementation possible. An MBA programme review identified that a module on research methods and a dissertation assignment did previously exist on the Executive MBA programme but it was removed as students did not like or see its relevance to management practice. This points to an opportunity to better communicate and develop understanding of and ability to use scientific research for practice.
2. A second challenge identified was critique of the Managing People and Organisations module by Executive MBA's as being too related to human resource management (HRM)- the remit of HR professionals and not general managers. As a HR and Organisational Behaviour Professor, aware of the scientific research illustrating the importance of various people management practices for individual, team and organisational performance, it was not surprising but it was disappointing to hear that general managers did not always see the value, as part of their roles, in attending to HR activities. This pointed to the possibility that improving leaders knowledge about scientific research illustrating how HR practices in fact enable organisational goals may develop their interest in engaging in HR activities.
3. A third challenge was to recognize that these students are already well-educated, with years of work experience. Executive MBAs appreciate their professional experience being recognised, discussed and applied to MBA programme content. They expect to hear from their peers regarding their own professional experience, stakeholder

perspectives, and organisational concerns. As such their professional experience and that of their organisational stakeholders must be recognised and included as part of their learning experience on any educational programme.

These three challenges underpin my drive to bring evidence-based management teaching to the DCU Executive MBA and DCU Business School. Evidence based management (EBM), which originated in evidence-based medicine, is the systematic, evidence-informed practice of management decision-making, paying attention to the quality of evidence available from science, organisational data, stakeholders and practitioner experience (Barends & Rousseau, 2018). As such EBM's focus on scientific evidence responded to the first evaluation insight about the DCU Executive MBA ie engaging students in reading and seeing the relevance of scientific research for practice. EBM's focus on practitioner and stakeholder experience permitted respect for and recognition of Executive MBA's vast professional experience. EBM's requirement to source organisational data was appropriate for Executive MBA's whose roles are data driven and who constantly focus on organisational performance metrics. As such a focus on data was both a language they understood, and they were likely in positions to review data relevant to organisational problems.

Trial Teaching EBM

On the basis of the above my first step was to trial teach EBM in my module on Managing People and Organisations. The focus here was on teaching EBM as applied to the topics on managing people and organisations and was a light version of strategies and methods discussed in more detail below. This initial trial involved:

- Pre-reading, discussion or use of scientific empirical articles and meta-analyses on managing people topics e.g HRM and Organisational Performance, Performance Management, Performance Feedback and HR Practices, to extract the question, the results, its usefulness to practice and to critically appraise the methodology.
- Use of the Carnegie Mellon University and CEBMa "Evidence-based Management Certified Online Course Modules" in this book) combined with in-class workshops on key content from these modules.
- Module participants were directed towards content on data analysis such as in statistical analysis textbooks (Field, 2024), verified youtube material (e.g. by Mark Saunders https://www.youtube.com/@MarkSaundersOnResearchMethods) and beyond that they engaged in self-directed learning on data analysis.
- Scaffolded assignments (as discussed in more detail below) requiring use of evidence-based management practices to complete a Managing People topic assignment.

Programme Decisions

As a result of positive evaluations of the module, evidence-based HR content and EBM skills development, I approached the Executive MBA programme board, with a proposal to elevate EBM teaching and content on the MBA programme overall. A decision was also taken to promote the DCU Executive MBA programme's unique selling point (USP) as being both an evidence-based MBA and developing evidence-based practice skills in participants, thus providing a sustainable transformative education to our MBA participants.

The next sections discuss various adaptable strategies and methods used to teach EBM which began and developed from module level and programme level EBM teaching on the DCU Executive MBA programme and were then subsequently rolled out and adapted for other programmes.

Key Strategies Used to Teach Evidence Based Management

As a teacher, four principles are central to my overarching teaching philosophy and are the foundation on which I teach EBM.

1. I adopt the role of learning facilitator guiding the students through the evidence-based management steps and facilitating them in learning how to understand and apply those steps.
2. I use a scaffolding approach to teaching and assessment where necessary and possible. In the case of teaching EB practice skills this involves some small in-class activities and small assignments that gradually require application of EB practice skills such as writing an answerable question, acquiring and appraising scientific evidence, including its usefulness for practice.
3. I provide feedback on in-class activities and small assignments to develop students' knowledge and skills as they progress through the various steps. I also hold regular 1-to-1 and team-based meetings with students to provide verbal feedback on work-in progress (e.g, discussing their question and its connection to their PICOC, reviewing their organisational data in relation to their question and their data quality).
4. The connection between research and practice and between university and industry is reinforced at all opportunities. This includes how science can inform practice, how practice can inform the direction of science, how and why science requires organisational engagement, why organisations need university engagement for research, how university- industry engagement is mutually beneficial.

Table 1 and the subsequent sections outline the timelines, strategies, and methods used in teaching EBM. Column 1: Timeline proposes when in the module/programme the proposed strategy/method is best introduced. Column 2: Strategy outlines the contextual justification or reason for using the methods proposed. Column 3: identifies the methods used to teach evidence-based management- further detail on which is provided in the subsequent sections.

Table 1. Timeline, Justification of Strategies and Methods for Teaching EBM

TIMELINE	STRATEGY JUSTIFICATION	METHOD
MOTIVATING ACCEPTANCE OF EBM		
Induction &/or Week 1	Changing Mindsets by Diagnosing Participants Knowledge & Its Trustworthiness	• Quiz • Discussion • Scientific Articles
	A Meta-Competency to Learn how to Learn Beyond the Programme	• Student & Facilitator led identification of organisational contextual factors impacting decision making • Discussion of the impact of those contextual factors on making trustworthy decisions • Discussion of the relevance of the meta-competency of learning how to learn in this context • Illustrating how the steps of EBM develop learning how to learn meta-competency
	The Basis for a Sustainable Education	• Differentiating Education & Training • Discussion of the role of University • Defining sustainable learning and development • Illustrating how EB practice skills develop learning how to learn meta-competency & provide a sustainable education

TIMELINE	STRATEGY JUSTIFICATION	METHOD
MOTIVATING ACCEPTANCE OF EBM		
	A Decision-Making Tool to Reduce Bias	• Exercises to demonstrate bias • Discussion of various biases that impact decision making • Reference to bias reading material • Illustrating how EBM is a decision-making tool to reduce bias • Compare EBM as a decision-making tool to other systematic decision-making tools in use
DEVELOPING EVIDENCE BASED MANAGEMENT SKILLS		
Weeks 1-4	Develop Core Knowledge on EBM	• Carnegie Mellon University online modules on EBM • CEBMa content
Weeks 1-4	Ask an Answerable Question	• In-class critique of possible questions • Provision of trigger questions needing refinement & definition • Submit proposed question & PICOC for approval • Consultations on proposed question & PICOC
Induction	Acquire Scientific Evidence	• Workshop with University Librarian CEBMa content
Ongoing	Engage with Scientific Evidence	• Scientific Articles • In-Class Discussions on > The question addressed in article > Trustworthiness of evidence in article > Usefulness to practice
Weeks 2-6	Acquire, Appraise, Apply, Scientific Evidence	To be used as pre-work, in-class activity, or assignment • Acquire & Appraise Scientific Articles sourced with respect to an answerable question • Apply Scientific Articles to Practice by identifying its usefulness & limitations for Practitioners • Apply Scientific Evidence in the CAT Project

TIMELINE	JUSTIFICATION STRATEGY	METHOD
DEVELOPING EVIDENCE BASED MANAGEMENT SKILLS		
Weeks 2-6	Engage with Organisational Evidence via Data Analytics	• Data Analytics modules • Data Analytics tutorials • Data Analytics consultations • Referencing to other reading or online resources
Weeks 6-10	Acquire Organisational Evidence: Various Strategies	• Use pre-existing or publicly available case studies or datasets • Use own organisational dataset • Collect stakeholder or professional experience insights
Weeks 6-12	Analyse, Appraise, Apply Organisational Evidence	• Analyse Organisational Evidence using Data Analysis Tools • Appraise Organisational Evidence • Apply Organisational Evidence in the CAT Project
VISUALISING EVIDENCE BASED MANAGEMENT IN ACTION		
	The CAT Project	• Presentation • Dragons Den
	Discuss Cases	• Solicit Students Cases • From published articles • Corporate Research Forum • Chapters in this Book

Changing Mindsets by Diagnosing Participants Knowledge and its Trustworthiness: My first strategy is to illustrate EBM's value to decision making and it begins with a quiz based on these articles (Rynes et al., 2002; Sanders et al., 2008; Tenhiälä et al., 2016) and these books (Pearce, J.L. (2021) *Organizational Behaviour: Real Research for Real Managers,* California, Mervin & Leigh Publishers; Locke, E. (2009) *Handbook of Principles of Organizational Behaviour: Indispensable Knowledge for Evidence Based Management*, Wiley). Executive MBA's, HR professionals or general managers are tasked with answering quiz questions taken directly from these articles and books and then subsequently presented with the answers. From

here the answers and the scientific sources behind those answers are presented and discussed. This exercise serves to highlight what knowledge students do possess and the scientific research behind that knowledge. It also highlights which knowledge and practices they believe to be effective are not based on scientific evidence. This quiz results in students posing questions about other areas of their knowledge or practices to identify if scientific research is available. These discussions raise their curiosity, engage their interest in evidence-based practice, helping to illuminate that there are also areas of management practice for which there is no or insufficient scientific research from which to inform decisions.

This approach, and others outlined below, help to influence student mindsets and attitudes regarding an evidence-based approach to decision making. Per the theory of planned behaviour (Ajzen, 1991) and related research, attitudes guide the adoption of new practices (Barends et al., 2017). So, beginning EBM teaching by influencing attitudes is a key leverage point for influencing practice. It was found that launching straight into teaching evidence-based management was sometimes met with resistance and a lack of clarity or reasons to adopt it. However, this quiz-based approach went some way towards opening minds.

A Meta-Competency: Learning to Learn Beyond the Programme: After some time, teaching EBM on modules and programmes, I identified that while I passionately believed in the importance of the meta-competency of learning how to learn and how fundamentally valuable evidence-based practice (EBP) is in developing this meta-competency, not all students shared my understanding, belief or enthusiasm. One obvious reason is of course everyone believes they already know how to learn. Another reason from post-experience students is that they are equipped already with educational qualifications, training and years of experience. They registered on these programmes to gain new qualifications, training and to get up-to-date knowledge in topic areas. However, it needs to be highlighted that what is taught on a programme is only sufficient for a moment in time, does not cover all possible topics and thus students would need to keep learning. It is, in tandem necessary, to take care to highlight both the value of the programmes and illuminate how participants meta-competencies on learning how to learn are developed alongside completing programme content. Two strategies were used to get this message across.

First, was discussing stable and unstable contextual factors which participants encounter in managing and leading in their organisations and how these factors make decision making challenging. The most obvious recent example is the COVID-19 Pandemic. The objective of these discussions was to highlight that despite all the knowledge gained on post-experience programmes, constantly developing and newly emerging contextual factors means that not everything participants need to be prepared for can be or is covered on such programmes. As such, they need meta-competencies to learn how to learn and be adaptable to change. In class,

participants identified contextual factors impeding or challenging their decision making or which required decisions to made in a vacuum or ever-changing circumstances. Other contextual factors discussed in this article (Harney & Gubbins, 2024) were also used to centre these discussions. Further still, discussions on technological developments most especially regarding the role of AI in information sourcing and decision making indicate how much easier it is to access information to inform decisions. However, it is equally now more difficult to know if that information can be trusted. Discussions on crisis situations highlight how decisions need to be made in the absence of scientific research and consequently illuminate the value of the best available organisational data which could be used in those circumstances.

Second, was outlining the core steps of evidence-based practice and how by engaging in EBP, the meta-competency of learning how to learn is developed. Evidence based practice is about making decisions in a conscientious, explicit, judicious and systematic way through the six steps of asking, acquiring, appraising, aggregating, applying and assessing.

TextBox 1. 6 Steps of Evidence Based Practice

1. **Asking**: translating a practical issue or problem into an answerable question
2. **Acquiring**: systematically searching for and retrieving the evidence
3. **Appraising**: critically judging the trustworthiness and relevance of the evidence
4. **Aggregating**: weighing and pulling together the evidence
5. **Applying**: incorporating the evidence into the decision-making process
6. **Assessing**: evaluating the outcome of the decision taken

Barends, E., Rousseau, D.M., & Briner, R.B. (2014). Evidence-Based Management: The Basic Principles: Amsterdam: Center for Evidence-Based Management.

I explain how EBP equips participants to pose questions on anything that arises during their working lives and systematically source and critically evaluate evidence pertaining to that question. This enables them to make an informed decision or reach an informed answer. As such in an ever-changing world of work, their education extends beyond the walls of the university, their time in university and the content of specific educational programmes and provides them with the meta-competencies required to address questions and challenges not covered on programme curricula at one point in time.

The Basis for a Sustainable Education: At the outset of programmes and modules, as mentioned above, I would always discuss with programme participants how EBP develops a key meta-competency on learning how to learn and thus provides a more sustainable education. However, in more recent years, I have identified that this argument needed to be deeper and reinforced more often. In a world where people expect fast information, fast answers, quick solutions and instant, there was increasing pressure for learning in the form of training, soundbites, skills development, a demand for tell me how rather than teach me how to learn for myself. In an environment where Professors, Programmes, Schools and Universities try to:

- respond to student expectations and increase student satisfaction
- respond to industry narratives that universities produce graduates whom know much but can do little
- increase student numbers, justify their existence and funding,

there can be increased pressure to provide what students want rather than what they need and provide training rather than an education. As such it has become increasingly important to discuss the difference between education and training, the role of universities and why education and a sustainable education is valuable beyond quick soundbites and skills training which can be sourced from a vast array of training providers.

A recently coined term *'sustainable learning and education'* (Hays & Reinder, 2020) provides a nice definition from which to launch such discussions. While I did not have this available to me when I originally started making this argument, it is certainly useful now. It defines sustainability *of* learning as learning that is continuous, enduring and proactive. Such learning focuses less on the amassing of knowledge or technical skills and more on learning to learn and optimising learning from experience. The need for sustainable learning and education reflects the fact that every organisation needs to be concerned with the ability of its people to continuously and effectively adapt to rapid and radical change, learn to deal with new and different challenges, and create and innovate better and faster than its competitors; and, sometimes, not to compete at all, but to collaborate (Trilling and Fadel 2009). Hays (2015) identifies how these skills and dispositions are in high demand but in short supply. There are arguments that more sustainable learning and education needs to be developed including through strategies and mechanisms to better promote and support learning to learn (Evans 2017; Smith 2016) at individual, team and organisational levels.

One such strategy towards providing sustainable learning and education is evidence-based practice (EBP). It teaches how to frame a question (Ask), it teaches students how to source the evidence they need to address any question they face now or in the future (Acquire). It teaches students how, in a world full of fast information, fast facts and fake news, to critically appraise the evidence they source to make decisions only on trustworthy evidence (Appraise). By equipping students with these skills and a decision-making toolset they develop the meta-competency of learning how to learn in a systematic explicit manner.

A Decision-Making Tool to Reduce Bias: The previous strategies discussed illustrating the reasons to engage in evidence-based practice might influence mindsets and attitudes, but they may fall short of influencing practice. While these strategies may help practitioners to see the value in EBM, some are still concerned with the lack of time they have available to engage in EBP. As such another strategy used is to conduct some exercises on and discuss bias in decision making and how systematic approaches to decision making reduce the influence of bias. The book "Judgment in Managerial Decision Making" by Bazerman and Moore (2018) is used as the basis for much of this content. Specifically, a number of common biases influencing decision making identified in this book are discussed. First, students are presented with exercises to help expose how decision making is influenced by various biases and then these biases are discussed. This then leads to introduction to and discussion about System 1 and System 2 thinking. System 1 thinking refers to our intuitive system, which is typically fast, automatic, effortless, implicit, and emotional. We make most decisions in life using System 1 thinking. For instance, we usually decide how to interpret verbal language or visual information automatically and unconsciously. By contrast, System 2 thinking refers to reasoning that is slower, conscious, effortful, explicit, and logical (Kahneman, 2003). In most situations, our System 1 thinking is quite sufficient, but System 2 thinking should preferably influence our most important decisions. The time poor nature of managerial life suggests that executives often rely on System 1 thinking (Chugh, 2004) but as biases are much more likely to occur in System 1 thinking than in System 2 thinking, practicing managers should engage in System 2 thinking for important decisions. System 2 thinking requires the use of more systematic decision-making tools, such as evidence-based practice.

It is helpful to remind practitioners that they do use systematic approaches to decision making in other areas of their organisation or their work and as such this is another such decision-making tool in their toolbox. Gubbins and Rousseau (2015) identify that reframing ideas as similar to something already accepted by practitioners helps them see its use.

Developing Evidence Based Management Skills

Develop Core Knowledge on Evidence Based Management - To develop students' core evidence-based management knowledge and skills, they were directed to materials provided by the Centre for Evidence Based Management (https://cebma.org/). In the majority of cases students were required to complete some or all of the Carnegie Mellon University https://oli.cmu.edu/courses/evidence-based-management-o-f/ and CEBMa online-learning evidence based management modules or courses https://cebma.org/resources/professional-development-online-course-new/.

To supplement this, each class session took some time to repeat and reinforce specific EBM content which would be necessary for students in completing their assignments. These

are discussed in the following sections and organised according to key steps of EBM ie.: Ask, Acquire, Appraise, Apply and in relation to two key sources of evidence ie Scientific Evidence and Organisational Evidence.

Ask, Acquire, Appraise, Apply Scientific Evidence - A scaffolding approach was used to develop students' evidence-based practice skills specifically regarding ask, acquire, appraise and apply scientific evidence. The design components of this approach are illustrated in Table 1. The key components were:

Ask an Answerable Question - A challenge identified by practitioners and academics is around framing a problem or question and then answering that precise question. Practitioners identify how many meetings or organisational projects are based on improperly defined questions or on concepts with multiple definitions leading to a lack of clarity as to what the focus of the question, problem or project is. This then leads to dissatisfaction about the solutions if they don't address everyones 'understanding' of what the problem/project was focused on in the first instance. Equally, academics experience frustration in reading student projects and assignments when they do not focus on and answer the question asked.

Being clear about the question and the definition of concepts contained within the question is the first step in evidence-based management practice ie Ask- translating a practical issue or problem into an answerable question. To facilitate students' skills in developing an answerable question, the following approaches were used:

- Students were given some broad questions in class to critique and improve e.g teamworking improves team performance. Students were required to firstly complete this task alone without guidance. Ultimately, the discussion required them to define "improves" and evaluate how it is measured. They were asked to consider multiple definitions of teamworking and team performance. They could also identify what boundary conditions to put on their questions e.g specific country, industry, organisational unit, level in hierarchy etc.
- Students were given some sample broad questions to trigger their thinking on what topics to focus on for both the minor and major CAT projects (see Appendix 1 Assignment details). They were required to refine those questions and define the concepts within.
- All students were required to submit their proposed CAT project answerable questions to the module lecturer for development and approval. Despite appearing like a simple step in the process, this step required more iterations than perhaps students expected.
- Students were required to develop a PICOC for their answerable question for the CAT project. The PICOC approach to helping frame answerable questions was generally valued by students for the purposes of the immediate project and identified as something useful in their evidence-based management practice in their organisations. This was also subject to feedback and approval.

Acquire Scientific Evidence - All programmes include, during programme Induction, a workshop with a University librarian introducing them to the library databases and how to conduct searches. The university library also has a number of online resources illustrating how to search for scientific articles. Further still, the Business School has a dedicated university librarian available to post-experience students for individual consultations. Students on a number of programmes were also directed to the Centre for Evidence Based Management resources on conducting library searches (https://cebma.org/resources/tools/cebmas-methodological-search-filters/).

Engage with Scientific Evidence - To encourage engagement with scientific evidence and to develop skills in reading, appraising and applying scientific evidence, modules focused on programme content e.g Managing People and Organisations, Practising Organisational Psychology, Strategic Learning and Development, Organisational Behaviour, were delivered using the evidence-based management lens. For each topic covered within each module, the focus was on discussing the best available scientific evidence on that topic. Students were required to engage in a number of ways:

1. Scientific articles were assigned in advance for pre-reading and then used to facilitate in-class discussions about the questions posed by the articles and the results.
2. The best available scientific evidence was presented in class focusing on the topic in question, the evidence available and then interrogating its quality.
3. In both scenarios above every session required extracting insights for practice from the scientific evidence and how these insights could inform the design of organisational interventions. The aim was to constantly facilitate conversations to bridge the research- practice gap.
4. Contemporary topics for which there is no or limited scientific research were also covered with discussions centred on what organisational data students could use to inform their decision making in these areas.

Acquire, Appraise, Apply Scientific Evidence - Modules which teach specific topics through an evidence-based management lens provided small incremental activities or projects to students to gradually develop their evidence-based practice skills ultimately culminating in a major project in the format of a CAT (critically appraised topic) which required use of all the previously developed skills.

1. To develop students' skills in acquiring, appraising and applying scientific evidence, activities or projects such as those in TEXTBOX 2 and 3 were completed. These required students to Ask a question and acquire scientific evidence which would provide

answers to that question. On completing these projects or presentations, students were given verbal and/or written feedback to illustrate the strengths of their report and the areas for development. This feedback could be then applied to the CAT project. The first activity/project focuses on acquiring and appraising scientific evidence. Students were encouraged to use the CEBMa content to evaluate and critically appraise scientific articles (https://cebma.org/resources/tools/critical-appraisal-questionnaires/) .

TextBox 2. Group Presentation Assignment Part (a)

Identify if scientific evidence exists for the effectiveness of a popular people management practice. You will be allocated a topic or you can identify your own (e.g. 360 Degree Feedback, Performance Goal Setting, Talent Management, Selection Interviews, Classroom V Online Training, Employee Engagement, Training, Face-to-Face V Virtual Project Teams).

- Specify precisely the question you are asking
- Use Academic Search Complete and Business Source Complete Databases (See Centre for Evidence Based Management for tips on how to search databases or contact DCU Library).
- Find at least 3 papers related to the practice
- Present on the following detail:
  - > How you searched
  - > The articles you found
  - > What conclusion you draw from your findings
    - Your conclusion MUST answer "is there scientific evidence that the practice or model is likely to be effective or useful?"
  - > How did you arrive at this conclusion
  - > Any concerns you have with your conclusion
  - > Any issues you identified in the articles which may suggest they are not the 'best scientific evidence'

2. The second activity/project focuses on applying scientific evidence to practice. Interestingly, a trend emerged across nearly all modules and programmes in relation to the second activity/project. Despite the fact that post-experience students are practitioners, when completing project 2, they focused more on appraising the scientific articles through a scientific lens as per activity/project 1 rather than a practice lens ie. identifying if the sample was relevant to practice or how the results of the studies could inform organisational interventions.

TextBox 3. Group Presentation Assignment Part (b)

On the same topic as Part (a) and using the same 3 academic articles.

> Identify the pro's and con's of each study's usefulness to HR practice

> Identify your choice for which is the most useful TO PRACTICE and the reasons why

> Present on the following detail:

- Pro's and why
- Con's and why
- Most useful to practice article and why

Other insights from implementing these activities/projects included:

- students sometimes extracted their insights from the theories presented in the scientific articles rather than the results of the studies/meta-analyses themselves.
- in answering the project 2 question pertaining to which article were most useful for practice, sometimes students would source excellent scientific studies and meta-analyses alongside a more readable, brief paper in a publication which may not be peer-reviewed or scientific and they would identify that paper as being 'more useful to practice'. This had more to do with readability than content. This, in itself, provided a valuable learning opportunity around appraising the sources and quality of scientific evidence.

Acquire, Appraise, Apply Organisational Evidence - To teach evidence-based management skills on acquiring, appraising and applying organisational evidence, the CAT project (see Appendix 1) was used. Guidelines on how to conduct a critically appraised topic (CAT) were shared: https://cebma.org/resources/guidelines-reas-and-cats/. The CAT project draws on

Kolb's learning theory and meta-analytic evidence that practice based methods combined with information is a most effective delivery methodology (Lacerenza et al., 2017). It also draws on recognition that programme material that is representative of the real world encourages more sustainable learning and practice (Ashford-Rowe et al. 2014; Hays & Reinders, 2020). The format of the CAT project varied depending on:

- the programme
- how much time was available to engage in evidence-based management content and
- the weighting of the assignments.

Engage with Organisational Evidence via Data Analytics - Given that evidence-based management specifies that one source of evidence is organisational data, the Executive MBA programme was redesigned to introduce a module on data analytics. In other programmes, subsequently, this module was also added and variously labelled as, for example, HR analytics, People analytics, Data analytics and Storytelling. These modules aimed to introduce students to foundational statistical concepts, teach skills on basic data management, data analysis, how to interpret statistical results and how to present statistical results. The types of software used in these modules varied with student and programme needs and lecturer preferences e.g Excel, SPSS, Jamovi and R.

These modules presented both opportunities and challenges. For example, students with a level of knowledge and skills with statistics and data were comfortable whereas those with no statistical knowledge or skills found it more difficult to apply the learning outside the modules themselves. For those students, extra supports provided included: lecturers being available for more individualised or team-based sessions, regular question and answer opportunities and being referred to freely available online YouTube material on specific statistical techniques.

There was and still is debate as to which software should be taught with the debate circling around what software students are more likely to use, have access to, is most user friendly and what level of sophistication in data analytic techniques students should be required to develop. From an evidence-based management perspective and for the purposes of the majority of post-experience programmes in DCU Business School, it is agreed that a basic knowledge of statistical concepts, an ability to conduct basic data analysis and a foundational understanding of statistical results so as to be able to interpret results to inform decisions is sufficient. It is suggested that where students require more sophisticated knowledge and skills that they should refer to data scientists in their organisations or develop their own skills further through other programmes or training. However, it was also identified from students that despite the narrative around organisations engaging more with big data and data analytics, the prevalence of data scientists in organisations has not kept pace (Almgerbi et al., 2021).

Acquire Organisational Evidence: Various Strategies

1. *Using Pre-existing Case Information and Organisational Data*

   For programmes or modules where the time available to teach and/or assess evidence-based management is limited or where students do not have access to organisational data, I have used two approaches:

   - **Option 1**: case studies and/or datasets I have generated myself from research/ consulting.

     My own anonymised case studies and datasets are based on real-life management problems. These may have been collated for research or consulting purposes and have permissions to use once anonymised. These are often of interest to practitioners encountering the same or similar problems. Students sift the datasets to identify a question which they wish to answer which the variables in the dataset can answer. They are tasked with producing a consulting report outlining the scientific and organisational evidence-based answer to the question.

   - **Option 2**: publicly available datasets e.g national, government or publicly available datasets from national/international research consortia.

     Publicly available datasets were provided to the students. These came from the central statistics office or ongoing national/international research projects which generate datasets and make them publicly available. Students identify a question they wish to answer for which there are data points in the dataset available to answer that question. They are then tasked with producing a consulting report outlining the scientific and organisational evidence-based answer to the question posed.

2. *Using Own Organisational Question and Organisational Data*

   For students with identifiable organisational questions/problems for which they need an answer and for which they have access to internal organisational data, they are tasked with:

   - identifying an organisational question/problem which requires an answer
   - sourcing the best available relevant organisational data
   - This approach has been applied in three different ways across and within various programmes to meet student needs.

   - **Option 1**: Team Based Project focusing on One Organisation

     Students can complete this project in teams with one organisation volunteering to be the focal organisation and providing the required question/problem and dataset.

- **Option 2**: Individual Project focusing on Own Organisation

  Students can complete this project as individuals which is sometimes requested to protect the confidentiality of the organisation, the dataset and the results.

- **Option 3**: Class Based Project focused on One Organisation

  On one programme where all students were from the same organisation, the class opted to generate a survey collaboratively as a collective, distribute it as a class with representatives from the class targeting specific areas of the organisation, clean and aggregate the data generated and generate one dataset which was used to address various questions/problems chosen by teams within the class.

3. *Using Another of the Three Sources of Organisational Evidence*

   An alternative option which I have used with pre-experience Masters students is to focus on and acquire and appraise organisational data in the format of stakeholder experiences and professional experience. This approach is also illustrated in Chapter "Capstone Projects Integrating Multiple Sources of Evidence" by Ann Smith and Alessandra Capezio in this book.

Analyse, Appraise and Apply Organisational Evidence - The data analysis tools and techniques suggested and CEBMa content are the basis on which students then analyse and appraise the data sourced and analysed. This content is then used in the CAT Project. This appraisal can include evaluation of:

- The method used to collect the data
- The credibility of the source of the data
- Any biases that may be present
- The reliability and validity of the measures used to collect the data
- The sample and its relevance to the question posed
- Sample size
- The trustworthiness of the data
- The quality of data analysis
- How the results can and cannot inform the question posed

Visualising Evidence Based Practice in Action

The CAT Project - This CAT project can culminate in a Dragon's Den style presentation of the CAT case to class colleagues and a panel of judges- either senior practitioners or world-renowned academics or both as is suitable for the design or audience. In early versions of as-

signed CAT projects, there was no presentation component. However, overtime the calibre of the top scoring CAT projects was such that it represented a missed learning opportunity to not illustrate them to all programme participants as a) examples of quality CAT's b) live examples of evidence-based practice in action, from which they could learn so as to further develop their EBM skills. This concluding presentation also serves to put students in a situation of having to both verbalise and answer questions about their question/problem and the associated evidence used to arrive at an answer which parallels practice scenarios where they have to defend their decisions to boards of management or employees.

Discussing Cases - Some student feedback requested case examples of evidence-based practice in use in organisations. There are strengths and limitations with providing case examples. A limitation is that on seeing a case example, participants may simply aim to replicate what they see rather than apply evidence-based practice to their organisation in a more customised way. Equally, participants may limit themselves to the standard presented in that case rather than pushing the boundaries further and implementing evidence-based practice more completely. However, on the opportunity side it enables students to "see one, do one" and provides a comparable organisation that they can relate to. Four suggestions for sourcing cases are these:

1. After programme participants are clear on what evidence-based management is and during discussion of the steps of evidence-based practice, module facilitators can request:
    - examples from participants of these individual EBP steps in action in their organisations based on their experience
    - examples of evidence-based management in action in their organisations
    - examples of where decisions were made without sourcing trustworthy evidence and where the steps of evidence-based practice would have been beneficial. This as a discussion point usually results in many examples and very lively and engaged discussions of faulty decision-making practices and biased evidence.
    - See the TextBox 4 exercise/project which could be adapted and used as the basis for a case discussion or a case project.
2. Use material provided in published articles using case studies as a basis for discussion. For example, a study exploring case organisations implementation of HR analytics (Belizón, M. J., & Kieran, S. (2022). Human resources analytics: A legitimacy process. Human Resource Management Journal, 32(3), 603–630). https://doi.org/10.1111/1748-8583.12417.)

3. The Corporate Research Forum is currently and iteratively engaged in research producing reports detailing how and to what extent evidence-based management is applied in member organisations. https://www.crforum.co.uk/research-and-resources/case-studies-ebhr-a-new-paradigm/
4. See Chapters in this book by Blake Jelley & Tina Saksida, Tatiana Andreeva and Denise M. Rousseau which include cases for use in teaching EBM.

TextBox 4. Project Exercise

Scientific Evidence

1a. Identify a Organisational Psychology Topic of Interest to you
TOPIC: _____
1b. Frame it as a question: What is the Scientific Evidence for the Impact of ___ on ____?
Question: _____
1c. Source 1 Scientific Article that answers this question & using that article state what the article identifies as the answer to the question and how it came to that conclusion.
Reference & URL: _____
Answer: _____
1d. Any quality/trustworthiness/reliability/validity/bias concerns you have with using this article to inform an Organisational Decision on this Topic.

_____

Organisational Data

Select an Organisational Decision (same topic) that was made in relation to this topic & question
2a. Details on the organisational decision:

_____
2b. The Decision that was taken

_____
2c. What Organisational Data and/or Other Evidence was used to justify this decision

_____
2d. Was it the correct Decision & how did you come to that conclusion?

_____

Teaching Evidence Based Management: The Key Challenges Experienced by Students

Acquire Scientific Evidence - In engaging in CAT projects a challenge which emerged despite students developing an answerable question, was where students sourced scientific or organisational evidence which did not directly answer the question posed. For example:

- studies or data which focused on a different outcome to that posed in the question
- focused on a different level of analysis ie individual, team or organisation
- focused on a different independent variable to that posed in the question
- became distracted by the results presented in scientific articles and discussed these broadly rather than focusing tightly on the result(s) which were directly relevant to the question posed.

These mistakes were valuable learning opportunities in helping students identify that despite having prepared a precise defined question, they still need to constantly remind themselves of what their focus was, what the question was when interrogating various sources of evidence and not get distracted by all the other information surrounding the answer they sought.

Appraise Scientific Evidence - Once provided with the tools for appraising scientific evidence, most post-experience students engaged in this process systematically and with a degree of comfort. Most often they recognised, for example, the sample sizes, the populations, the relevance of the sample or population for their organisational context. A lesser number of students, for example, differentiated between cross-sectional and longitudinal methodologies, called out meta-analyses and recognised the strength of regression coefficients thus these elements needed to be reinforced to ensure a complete appraisal of the trustworthiness and relevance of scientific evidence.

Acquire Organisational Evidence - To complete the CAT project, students were required to acquire organisational data using various options as outlined above. On numerous occasions and most especially when presented with the CAT project, the initial reaction from students was "*I do not have access to data*". After first asking them to step back, take some time and review possible questions to ask, review what data is collected within their organisations, what data they and their peers refer to regularly, what metrics are tracked within the organisation

and across various departments, many students would then identify that organisational data did exist and identify what was within their control to access or how to go about accessing data. On some occasions, students still felt they did not have access to data. On a number of occasions this was indeed the fact and alternative solutions were provided as identified above. However, on other occasions an invaluable insight occurred for me when I recognised that the real issues included that students:

- could not identify what the organisational data was actually measuring. As such they could not match the data and measures to the 'concepts' they were investigating.
- only obvious metrics were identifiable ie performance ratings, revenue, gender, absenteeism, numbers attending training, happy sheet scores. What was less apparent, recognisable or used in the manner required by the CAT projects of what is the impact of X on Y were metrics like individuals objective job productivity, team productivity, measures of efficiency, quality metrics like number of errors, comparisons across groups like contractors versus permanent staff, those taking part in an intervention versus those whom did not. This article by Maria Belizon et al. is useful to inform programme content or in class discussions to help HR students identify possible data points that could be used in projects. (Belizon, M.J., Majarín, D. & Aguado, D. (2023) Human resources analytics in practice: A knowledge discovery process. European Management Review, 1–19. https://doi.org/10.1111/ emre.12605)

Appraise Organisational Evidence - With respect to organisational evidence, students were especially interested in appraising the trustworthiness of organisational evidence and were frequently enthralled and/or perplexed when the foundations of the data being used were found lacking. It often resulted in them identifying ways to improve the measures in use or add more measures to what the organisation was collecting. For example:

- measures focusing on quantity but not quality
- measures focused on behavioural dimensions but grounded in open questions or one item questions
- being unsure of what basis was behind measures used by external consultant surveys which provided annual average scores of performance

In some instances, this resulted in some students abandoning the 'best available organisational data' available to them and devising their own surveys and using validated instruments to collect new organisational data. For those without training on developing their own surveys, this did require additional content, 1:1 or team-based work, with students to inform them on

how to develop their own surveys. In this case strategies used included:

- students were referred to the book "*Taking the Measure of Work*" (Fields, 2002) to see examples of validated instruments on constructs that may be of relevance to them
- students were required to source published validated instruments which I would then review and approve before they designed the survey
- Once surveys were designed, I would review, provide feedback and approve those surveys. Additionally, all the ethics requirements of DCU Business School would have to be adhered to before any surveys were administered. Students would also liaise with their HR department or relevant manager to seek internal approvals for to distribute the surveys.

Analyse Organisational Data - The approach taken in modules on or using the evidence-based management lens discussed here all required students engaging with organisational data in some capacity as outlined above. The approach taken in many instances required students to analyse raw data themselves. However, it is important to note potential resistance from students and faculty to this approach. The reasons for students resisting included lack of comfort or knowledge on data analytics, a belief that developing those skills was not relevant to them/ their role/this module/this programme. These reasons are increasingly evident in research while concomitantly reports on future skills needs highlight the need to develop these very skills in more practitioners. Reasons for faculty resistance included that students do not need to learn how to analyse data as they could use data scientists within their own organisations. The requirement that students engage in some level of data analysis was grounded in the learning principles that *doing* facilitates learning and deep understanding (Ardley & Taylor, 2010; Leonard & Marquardt, 2010) and recognition of the increasing need for such skills in practitioners.

Aggregate the Evidence - Two key questions emerged when students were required to aggregate evidence. First, what to do when pieces of scientific evidence contradicted each other and second, what to rely on when scientific and organisational evidence contradicted each other. The CAT project required students to identify the basis for their final decision and recommendations ie its foundation in scientific and/or organisational evidence. These questions provided another valuable learning opportunity in respect of appraising the evidence in terms of trustworthiness and relevance to the question posed.

Does Teaching EBM Work?

Evaluations - Student module and programme evaluations are conducted annually and positive qualitative evaluations included "*the module was highly effective in teaching me an 'evidence based' approach to HR and strategic decision making", "the assignments were very effective as a learning tool", "practicing evidence-based research through assignment was a valuable and worthwhile practice", "it has changed how I will approach business cases and decision making", "I found it very interesting to read the articles made available to us as it definitely provided a different perspective"* and *"overall, it was a great module in terms of shaping my thinking pattern toward an evidence based system. I feel this module will have the biggest impact on me as it has shaped my thinking on an evidence-based approach."*

These evaluations also provided insight into what students did not like or found difficult or re-design ideas. These insights were used to inform some of the content in the previous section about the challenges experienced by students.

Feedback from judges invited to be part of the CAT project judging panel included: *"I am very impressed with the quality of the projects….I think the assignment you developed is a great example for all other universities, program's and teachers", "the calibre of projects was impressive and I have ideas I can take back to my organisation,"*

External Examiner feedback included *"I think this is an excellent assessment and indeed best practice,"*

Pre-Post Test -A pre-test post-test instrument (see Appendix 2) was designed based on material from the CEBMa and implemented on some programmes and/or modules to investigate if students EBM knowledge developed post taking the EBM content. Implementing a pre and post-test instrument such as this is also useful in illustrating to faculty or the School if and in what way teaching EBM impacts students' knowledge and skills.

Reflections: Whats Next?

The argument for introducing EBM to the DCU Executive MBA programme, the positive feedback from students on its success, the step-change in the quality of assignments aggregating, appraising and applying scientific evidence and organisational data were indicators of its success. Furthermore, there was recognition that the meta-competencies developed from evidence-based practice makes for a sustainable education.

These results and recognitions subsequently influenced DCU Business School, which is the ultimate measure of success. The DCU Strategy 2017-2022 explicitly required DCU Business School to undertake Curriculum Reform "*We will embark on a review of our curriculum to ensure that it challenges learners, preparing them for the world of work and lifelong learning*".

This curriculum review process commenced with identification of EBM as a stream of content that would be central to all undergraduate and postgraduate programmes commencing from 1st year undergraduate through to Masters programmes. As the module would span a diversity of programmes across the school totalling some 600 students, the Associate Dean of Teaching & Learning convened a taskforce of faculty from across disciplines to design the module. I was involved as a subject matter expert on EBM. This project, the teaching methods, the evaluations and the pre-post test results are discussed in Chapter "Developing Foundational Evidence-Based Practice Competencies: Critical Thinking for Business Students: A First Year Undergraduate Module" by Orla Feeney in this book.

Introducing, teaching and implementing EBM teaching has not been without its challenges. However, my experience, the feedback from (some not all) students during and post programme completion, how EBM principles and skills have been applied by students and faculty elsewhere on programmes and the evidence I have seen in the quality of CAT projects is such that my belief in and passion for EBM teaching remains. It develops meta-competency to learn how to learn, it provides a sustainable education and it bridges the research-practice gap. There is still room to develop our practice beginning with more evaluations of what EBM delivers in terms of knowledge and skills for our students. More is needed to identify if and how EBP skills developed in our students transfer to their workplaces. From here we can learn more about how to better teach EBM and illustrate its value. References

References

Ardley, B. & Taylor, N. (2010) The student practitioner: Developing skills through the marketing research consultancy project. *Marketing Intelligence & Planning*, *28*(7), pp. 847–861.

Ajzen I. (1991), The Theory of planned behavior. *Organizational Behavior and Human Processes*, *50*, 179–211.

Almgerbi, M., De Mauro, A., Kahlawi, A., & Poggioni, V. (2021). A systematic review of data analytics job requirements and online-courses. *Journal of Computer Information Systems*. DOI: 10.1080/08874417.2021.1971579

Ashford-Rowe, K., Herrington, J., & Brown, C. (2014). Establishing the critical elements that determine authentic assessment. *Assessment and Evaluation in Higher Education*, *39*(2), 205–222.

Barends, E., & Rousseau, D. M. (2018). *Evidence-based management: How to use evidence to make better organizational decisions*. Kogan Page Publishers.

Barends E., Villanueva J., Rousseau D.M., Briner R.B., Jepsen D.M., & Houghton E. (2017). Managerial attitudes and perceived barriers regarding evidence-based practice: An international survey. *PLoS One*, Oct 3, *12*(10).

Bartunek, J. M., & Rynes, S. L. (2010). The construction and contributions of "implications for practice": What's in them and what might they offer? *Academy of Management Learning and Education*, *9*(1), 100–117.

Bazerman, M.H. & Moore, D.A. (2012). *Judgment in managerial decision making* (8th Ed.). Wiley.

Chugh, D. (2004). Societal and managerial implications of implicit social cognition: Why milliseconds matter. *Social Justice Research*, *17*(2), 203–222.

Evans, K. (2017). *Bounded agency in professional lives*. In M. Goller & S. Paloniemi (Eds.), Agency at work: An agentic perspective on professional learning and development. Professional and Practice based Learning series (Vol. 20, pp. 17–36). Cham: Springer.

Field, A. (2024). *Discovering statistics using IBM SPSS statistics* (6th Ed.), Sage.

Fields, D.L. (2002). Taking the measure of work: A guide to validated scales for organizational research and diagnosis. Sage.

Gubbins, C. and Rousseau, D.M. (2015), Embracing translational HRD Research for Evidence-Based Management: Let's talk about how to bridge the Research–Practice Gap.*Human Resource Development Quarterly*, *26*, 109–125. https://doi.org/10.1002/hrdq.21214

Harney, B., & Gubbins, C. (2024). Human Resource Development (HRD) Meets Human Resource Management (HRM): A Skills Based Agenda for a FRAGILE World Order. *Advances in Developing Human Resources*, *0*(0). https://doi.org/10.1177/15234223241267922

Hays, J. (2015). *Chaos to capability: Educating professionals for the 21st century*. Auckland: Unitec.

Hays, J. & Reinders, H. (2020), Sustainable learning and education: A curriculum for the future. *International Review of Education*, *66*, 29–52.

Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist*, *58*(9), 697–720. https://doi.org/10.1037/0003-066X.58.9.697

Lacerenza, C.N., Reyes, D.L. & Marlow, S.L. (2017), Leadership training design, delivery and implementation: A meta-analysis. *Journal of Applied Psychology*, *102*(12), 1686–1718.

Leonard, H.S. & Marquardt, M.J. (2010), The evidence for the effectiveness of action learning. *Action Learning: Research and Practice*, *7*(2), 121–136.

Rynes, S. L., Colbert, A. E., & Brown, K. G. (2002). HR professionals' beliefs about effective human resource practices: Correspondence between research and practice. *Human Resource Management*, *41*, 149–174.

Sanders K, van Riemsdijk M, Groen B. (2008) The gap between research and practice: a replication study on the HR professionals' beliefs about effective human resource practices. *The International Journal of Human Resource Management*, *19*(10), 1976.

Smith, C. (2016). Self-directed learning: A toolkit for practitioners in a changing higher education context. *Innovations in Practice*, *10*(1), 15–26.

Tenhiälä A, Giluk TL, Kepes S, Simón C, Oh IS, Kim S. (2016).The Research-Practice gap in human resource management: A Cross-Cultural study. *Human Resource Management*, 55(2):179–200.

Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. San Francisco: Jossey-Bass, Wiley.

About the Author

Claire Gubbins is a Professor of Organisational Behaviour & HRM at Dublin City University Business School, Ireland, Lead of the LInK Lab at the Irish Institute of Digital Business and she is founder and Director of the Masters in Strategic Learning & Development for the Centre of Executive and International Education at DCU in collaboration with the Learning & Development Institute of Ireland.

Her research interests centre around social relationships at work. She investigates the role of social networks in facilitating learning processes and tacit knowledge circulation; the impact of hybrid/remote working models on social networks and evidence based practice as a mechanism for continuous learning and sustainable education and advancing the HR profession. Her research is published extensively in top tier journals including Human Resource Management (US), Organisation Studies, Human Resource Management, Journal of Management Inquiry, Human Resource Development Quarterly, Advances in Developing Human Resources, Human Resource Development Review, Journal of Knowledge Management and European Journal of Training & Development, as well as numerous book chapters. She is co-author of two books: Learning & Development in Organisations: Strategy, Evidence and Practice with Oaktree Press and Learning and Development Effectiveness in Organisations: An Integrated Systems-Informed Model of Effectiveness with Palgrave.

She has over 20 years experience consulting with industry nationally and internationally in these same areas and is a regularly invited speaker at academic and industry events. She also designs and delivers executive education programmes and workshops for the Centre of Executive and International Education at DCU. She has served as a judge for the National Learning & Development Industry awards.

She received the DCU Presidents award for Excellence in Teaching Innovation in 2013 and was shortlisted on numerous occasions. She was awarded an International Advance HE Senior Fellowship for Teaching Excellence in 2021.

She is an invited Fellow of the Centre for Evidence Based Management (CEBMa). She serves on the council for The Learning & Development Institute of Ireland (L&DI) and the Irish Academy of Management (IAM). She is Chair of the IAM Early Career Development Network supporting early career academics nationally.

Previously Claire was a Fulbright Scholar at Carnegie Mellon University, a visiting Professor in Princess Nourah Bint Abdulrahman University in Riyadh, an Associate Editor for Human Resource Development Quarterly, Director of the award winning DCU Executive MBA Programme, Director of the Graduate Certificate in Strategic Leadership for DCU

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Appendix 1

CAT Project

Identify within your organisation a strategic HR decision/HR question which needs to be answered. It must be a question for which you can source relevant raw organisational data, either within your organisation, a colleague/friends organisation or within a comparable other organisation. This means the question must be based on something **already implemented**. Please do so in consultation with the instructor and where relevant colleagues in the HR function of your organisation.

You **must** gather a) scientific academic evidence and b) organisational data to help answer this question and make a decision. If either a) or b) is omitted the assignment is considered incomplete and not addressed as required and your grades will reflect this. Again, ensure you discuss your choice with the instructor before embarking on the project to ensure it fits with the task assigned and is sufficiently precise.

Please consult the instructor about accessing one set of data as a team and then investigating different questions from within that data set. You may also complete this assignment individually if you wish. Ensure you read the DCU Research Ethics guidelines document for the purposes of collecting your organisational data- it is available on the module LOOP page- and submit the completed ethics form BEFORE commencing data collection.

Some examples of broad possible questions include the following, but you may think of others and you will need to refine your question into an answerable question.

1. Does pay-for-performance improve organisational performance metrics in your company?
2. Is investing in workforce training financially beneficially to your department/organisation?
3. Are technology focused approaches to training delivery effective in helping achieve training/organisational performance metrics?
4. Are geographically dispersed teams likely to perform effectively as compared to non-geographically dispersed teams?
5. Does increased job autonomy improve employee performance?
6. Does flexible working practice increase employee commitment to the organisation?
7. How effective is downsizing on key business metrics?

8. Is high CEO compensation worth it for key business metrics?
9. Do more effective social network structures improve tacit knowledge sharing?
10. Does increased senior female representation improve key business metrics?

What to include in your report:

You should write this assignment as a consultancy assignment with a set of recommendations for action. The written report should include:

- Question
- Definitions of key concepts in the question
- PICOC for your Question
- Background to Question
- A description of the strategic decision and its location within the company's overall strategy
- Search Strategy (Scientific & Organisational)
- Evaluate the Best Available Relevant Scientific Evidence arising from your Search which answers your question (2-3 pages)
- Analyse and Evaluate the Best Available Relevant Organisational Data arising from your Search which answers your question (3-4 pages). Use the sessions delivered in the module on Data Analytics to enable this analysis and evaluation.
- Integrate the evidence from across the scientific and organisational evidence sourced and draw a conclusion as to what it supports, does not support and aspects of your question for which you have no evidence.
- Present a set of recommendations for the organisation on this question/decision with justification (using references to the scientific and organisational evidence).
- References
- Appendices

The key general criteria for grading are listed below:

- Clear question
- Definitions of key concepts in the question
- Clear and correct PICOC
- Evidence of ability to see and explain relationship between HR decision and Company strategy

- Effective search strategy described
- Thorough evaluation of the evidence under clear headings
- Effective integration of the evidence to identify the 'big picture' regarding what the evidence says
- A conclusion regarding what the evidence says about the question posed- i.e. answers the question posed
- Feasible, justified and related recommendations which stay within the boundaries of available evidence
- Use of scientific and organisational evidence which is directly applicable to the question posed.
- Structure & Flow of Report.
- References (scientific evidence) used- is it the 'best available evidence'?
- Grammar/readability (punctuation, spelling, sentence structure, proof read)
- Format (clearly referenced, proper bibliography, proper citations)
- Appearance (professional cover page, student names, ID numbers, typed, neat)

Assignment Tips:

- See CAT Guidelines Document and Sample CAT on LOOP
- See online EBM Modules
- Sample Size:
  - > See Data Analytics module for more on what is sample size.
- Statistical Analysis:
  - > You need the original raw data- not data where the analysis has already been done e.g by consultants.
  - > You should report results on statistical analysis in layman terms to demonstrate understanding.
    - The level of statistical analyses required will depend on your question but likely includes:
    - Descriptive statistics e.g. reporting means/averages is not sufficient
    - Need to produce t-tests, correlations, regressions, ANOVA (not all of these will be relevant to everyone's question so choose the appropriate statistical test for the question posed).

        - You can, if you wish but not necessary, include control data (other variables which may effect the variables you are studying- but just the minimum) in your analysis e.g. gender, age, education etc.
        - If your results reveal no relationship- that is fine- critique your approach, context and discuss your 'no relationship' finding in context of scientific evidence
    - > The Background section of the report should make the link to organisational strategy clear.
    - > Critically appraise everything!
- If doing your <u>own survey</u>
    - > You must use published measures/scales/instruments- you can not 'make up' your own questions- see "Taking the Measure of Work" Book, link posted on LOOP for a sample of such measures/scales/instruments on some topics
    - > See ethics form/cover letter posted on LOOP where doing your own survey
    - > Calculate Cronbach alpha (reliability) for each measure you use in your own survey
    - > You can, if you wish but its not necessary, include control data (other variables which may effect the variables you are studying- but just the minimum) in your survey & analysis e.g. gender, age, education etc.
    - > See Andy Field book on SPSS or Data Analytics module

Grades & Progressing Your Report for a Presentation to a Panel of Judges:

- Based on the grades awarded to the reports, the top 3 reports will prepare and deliver a presentation to a panel of academic judges in the field.
- The judging panel will rank order the presentations based on grading criteria they develop.
- Their rank will determine the following:
    - > 3rd runner up will receive an additional 5% on their report grade
    - > 2nd runner up will receive an additional 10% on their report grade
    - > Winner will receive an additional 15% on their report grade
- All students should attend these presentations.
- There will be time for questions & answers and meeting the judging panel afterwards.

Appendix 2

Pre-Post Test Instrucment

1. How would you define critical thinking? (*Select one or more*)
   a. The process by which one acquires knowledge through experience, thought and sensory input.
   b. The capacity to be aware of, control, and express one's emotions, and to handle interpersonal relationships judiciously and empathetically.
   c. The objective analysis of an issue and the data, facts and evidence relating to it.
   d. The ability to think clearly and rationally, understanding the logical connection between the different components of a decision or a problem.
2. Why do we need critical thinking in business? *(Select one or more*)
   a. The process by which one acquires knowledge through a. So we can influence people.
   b. So we can recognise falsehoods in evidence presented to us.
   c. So we can recognise flawed reasoning.
   d. So we can criticise more effectively.
3. Why do students need to use critical thinking? (*Select one or more*)
   a. So we can understand how verbal and nonverbal behaviours are implicated in our interpersonal interactions.
   b. So we can identify and manage our emotions and the emotions of others.
   c. So we can evaluate the strength of the evidence to support different arguments.
   d. So we can enhance our 'perspective taking' skills when engaging with fellow students.
4. Critical evaluation means identifying only negative aspects when making an analysis. (*Select one*)
   a. True
   b. False
5. Research conducted by a top university professor published in a top academic journal does not need to be critically evaluated. (*Select one*)
   a. True
   b. False

6. Imagine you are preparing for your first year exams. Would you regard the following statement from a lecturer as evidence of how to perform well in exams? (*Select one*)

   "In the 15 years I have worked as a lecturer I have noticed students are more likely to perform well in exams if they have attended lectures."

   a. Yes
   b. No

7. According to DCU's Professor of Enterprise & Innovation, 50% of new businesses fail in their first year. Would you regard this as evidence? (*Select one*)

   a. Yes
   b. No

8. Imagine you are completing an essay for your HR101 module on Motivating Employees. Would you regard an Irish Times article written by a top CEO reflecting on her experiences of motivating people as evidence? (*Select one*)

   a. Yes
   b. No

9. Read the following abstract of an empirical study entitled "The effect of early entrepreneurship education"

   The aim of this study is to analyse the effectiveness of early entrepreneurship education. To this end, we evaluate a leading entrepreneurship education program that is taught worldwide in the final grade of primary school. We focus on pupils' development of entrepreneurship knowledge and a set of non-cognitive skills relevant for entrepreneurial activity.

   The study was conducted between February and July in 2010, and again during the same period in 2011. In total 120 schools participated in the study. Random assignment to the treatment or control group took place at the class level. Classes assigned to the control group were excluded from participating in the education program.

   To gather data for determining the effect of the education program, all pupils had to complete two extensive questionnaires, measuring entrepreneurial knowledge and non-cognitive entrepreneurial skills. The questionnaires were sent to all 120 schools in February 2010, before the education program started. The second questionnaire was sent out to both treatment and control classes in July 2010, after the education program ended. The results indicate that knowledge is unaffected by the program. However, the program has a robust positive effect on non-cognitive entrepreneurial skills.

What is this study's research question? (*Select one*)

a. Evaluate a leading entrepreneurship program.
b. How does early entrepreneurship education affect non-cognitive entrepreneurial skills.
c. Can final grade primary school pupils learn to be entrepreneurs.
d. Jurisdictional differences in early entrepreneurship education.

10. Read the following results from a study entitled "The Relationship Between Employee Engagement and employee turnover: A Meta-Analysis":

Based on 521 cross-sectional studies with a total sample size of 9,939 business units and 23,567 employees, this meta-analysis examined the relationship at the business-unit level between employee engagement and turnover. We found a significant correlation between overall engagement and business-unit turnover.

What conclusion(s) can be drawn based on these findings? (*Select one or more*)

a. The findings indicate that a higher level of employee engagement leads to a lower turnover.
b. The findings indicate there is a weak relationship between employee satisfaction and turnover.
c. It is unclear whether a higher level of employee engagement leads to a lower turnover.
d. Given the large number of studies a causal relation between employee satisfaction and performance is likely.
e. The findings suggest there is no causal relation between employee satisfaction and performance.

11. Determine which of the following journals are peer reviewed by looking up their information page in the A-Z Journals Database. (*Select Yes or No*)

a. Strategic Management Journal
b. Harvard Business Review
c. Accountancy Ireland
d. Employee Relations

12. In 2017, Deloitte published a report focusing on key competencies in the digital age. On page 29, you will find Figure 11. illustrating the future importance of skills.

Rank the proportion of jobs as a percentage of total employment for which the following skills will be important in 2030:

a. Critical thinking
b. Active Listening
c. Judgement and Decision Making
d. Active Learning

13. Which of the following statements regarding peer-reviewed journals are correct. (*Select one or more*)
    a. Research articles published in peer reviewed journals are evaluated and critiqued by independent, anonymous scientists in the same field.
    b. The process of peer review ensures that a research article is valid and reliable.
    c. A research article published in a peer reviewed journal with a high impact factor does not need to be critically appraised.
    d. Peer review gives you some assurance that a research article is not seriously flawed.
14. Imagine you are trying to get fit. You are thinking about downloading Nike's fitness tracker app. Would you consider as evidence the outcome of a Nike survey that indicates that most people find it easier to get fit when using a fitness app? (*Select one*)
    a. Yes
    b. No
15. Over a 5-year period, whose professional expertise would you judge to be most valid and reliable? Check all that apply. (Select one or more)
    a. An eye surgeon specializing in eye laser surgery.
    b. A management consultant specializing in culture change.
    c. A car salesman specialized in selling second hand cars.

A Curriculum Approach: Teaching Evidence-Based Management to Bachelor and Masters Work, Organizational, and Personnel Psychology Students

Jeroen Stouten

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Teaching Evidence-Based Management to Bachelor and Masters Work, Organizational, and Personnel Psychology Students

Jeroen Stouten

EBMgt plays an important role in preparing work, organizational, and personnel psychologists for the profession. In our curriculum, we gradually develop students' skills to acquire and critically appraise the four types of evidence over bachelor and master years. Students learn to acquire, appraise, and aggregate the scientific, practitioner, stakeholder and organizational evidence. In their final master and internship year, students consider all types of evidence, aggregate, apply and assess the evidence completing the entire EBMgt process. This chapter describes the scaffolding of EBMgt knowledge and skills through examples of assignments used to prepare students to use EBMgt while working in organizations.

At KU Leuven, we prepare students for working professionally as a work, organizational and personnel psychologist, and equip them with relevant theoretical knowledge as well as necessary business and interpersonal skills. Profession derived from the latin *professus* ('affirmed publicly') implies that one has the obligation to use one's wisdom and power well. This means students are expected to act with integrity and ethics but also – in line with the psychologists' deontological code – to take responsibility for the choices they make and the consequences they may bring. Evidence-Based Management (EBMgt) helps students in this process as it allows them to make informed decisions, helping students take responsibility for their professional decisions.

We take an integrated curriculum approach to EBMgt education to foster deeper learning and learning transfer. This means students have repeated opportunities to develop EBMgt skills. Learning EBMgt allows students to more quickly search for scientific evidence for a problem, have essential theoretical knowledge to see conceptual links, to work with data, stakeholder evidence, and engage experts in structured and purposive ways in order to come to a suitable solution. In this chapter it is explained how EBMgt is implemented in the work, organizational and personnel psychology bachelor and masters programs at KU Leuven. It details aspects of EBMgt that are given particular consideration, which teaching aids are used and how teaching EBMgt to Bachelor and Master students is likely to be different from postgraduate students.

Our Curriculum

EBMgt

EBMgt course material is spread out over three years. The curriculum for work, organizational and personnel psychology students ranges from the 3rd Bachelor year to the two Master years. EBMgt is gradually introduced and evenly divided over the three years (see Table 1). In the 3rd bachelor year, students focus on scientific evidence and evidence from practitioners through CEBMA's online modules. In the master years, they learn on stakeholder and organizational evidence. EBMgt is integrated in different courses over different years so that over time the different types of evidence are rehearsed and further incorporated into the student skill set. In the first masters year, students learn about stakeholder evidence while still incorporating scientific and expert evidence into their thinking. In the final internship year, students are required to integrate and practice the 6 As, which means acquiring and appraising the four types of evidence. During the internship students work for seven months in an organization, where they are introduced to applying what they learned. Depending on their preference, students take up the position of for example, HR generalist, consultant, trainer, or recruiter. While they work in the organization, students are also required to work on a project from start to finish (e.g. examining absenteeism and offering solutions). Here, they engage in using EBMgt's four sources of evidence on specific projects by acquiring and appraising stakeholder, practitioner, scientific evidence and organizational data.

When the Question is not the Question

An important first step is Asking, where students learn to come to diagnosis. This means students do prework by gathering information in a fashion such that the student identifies the critical question that needs to be answered. For students this is probably the most difficult of EBMgt to learn as it requires them to disentangle what appears to be the problem, from the actual critical

question to address. Often, practice poses questions which are complex, having a large number of implicit or explicit sub-questions, or seems to hide a deeper underlying problem. Ask (or diagnosis) is a first step in the EBMgt process, to decompose the question to its pure form. A further step is to determine if the question is supported by organizational evidence, that is, is the problem that is posed relevant, timely, and important. As an example, an organization plans to install an agile team structure, removing the managerial level entirely. Here, several questions arise. What is the reason this solution is chosen? What is the problem that one wishes to resolve and relatedly, which outcomes does one foresee that would improve? Is the switch to teams or a different team structure helpful, has it been shown to be effective for what the organization foresees? It is quite possible when drilling down to the actual problem situation, a different issue pops up. Such as, employees may have difficulty cooperating because an individual compensation system is in place, which may hamper information sharing.

Table 1. Overview of Students' Introduction to EBMgt over the Bachelor and Master years, Including Assignments

	EVIDENCE	HOW TOPICS ARE PRESENTED FOR ASSIGNMENTS	ASSIGNMENT FORMAT
Bachelor	Scientific	Practitioner videos stating a problem relevant for their organization	Presentation directed at a broad audience CAT paper
	Practitioner/Expertise	Practitioner workshops	CAT paper
Master	Stakeholders Organizational Data	Students work on an actual organizational assignment	Presentation for the client Written report
	All four types of evidence	Internship during an academic year, working on multiple projects	Presentations Written reports Portfolio of projects

Diagnosis requires knowledge and skill to recognize concepts in theory that relate to practice. In the example, it is relevant to learn what the organization understands agile teams to be. Given the popular notion, agility is likely to be interpreted in many ways and clear

comprehension of what an organization defines as agility helps to delineate the problem. It is helpful if students practice associations between concepts in theory and in practice. In class, we practice this by having students diagnose practitioner questions. Practitioners detail their question in a video in which they explain the context of their organization, the problem they are facing or the solution they wish to install. Taking the example of the agile team structure, a HR manager would post a video to students describing their organization: what they do, the industry they are in, challenges they may face, followed by their aim to implement an agile team structure. Often, the practitioner video presentation raises issues that tap on more than just the problem, where students are required to analyze the complexity to drill down to the fundamental question. In the video, practitioners may go into detail regarding what agile team structure means to them and explain how they think it links to removing the managerial level. Sometimes they are vague on the ultimate outcomes they foresee; other times, they generate a broad list of outcomes from performance to engagement and happiness.

Students need to dive into what is meant by each of those terms. How does the HR manager understand or define agility, or each of the different outcomes? Does this question after defining these, truly deal with agility or linking to structural interventions such as removing hierarchy? For example, the HR manager may explain that line managers would become coaches. To what extent does this change their role? Analyzing the complexity of a question and deep diving into what is truly meant is essential here.

Students are also given opportunities to learn to ask different types of questions including why, what and how questions in order to gain a deeper insight into a question. For example, why is an agile team structure thought to be important? Why is it a solution and to which problem? Why remove a layer of line management? Through asking these questions it is possible that agile team structures are a solution but not to the specific problem. Maybe teams have trouble adjusting flexibly to customer demands because the team's rules or their managers won't let them. Answers can be sought from theory on how teams and groups operate and how leadership can offer support. A better understanding is created of the practical problem by asking deepening questions, clarifying definitions, and asking why something is needed.

This exercise also offers students opportunities to connect to theoretical concepts they already know. A good understanding of fundamental theories in organizational psychology, organizational behavior and management goes a long way in analyzing the complexity of a question. Through this knowledge, students see connections with other concepts they have learned, such as agility and learning, adaptive performance, or the way tasks are organized in teams and roles allocated to solve problems flexibly. That way, theory building and EBMgt is introduced simultaneously to help students see connections between theory and practical application.

Dealing with Context in Scientific Evidence

Answering a practical problem requires a sensitivity to the problem's context. Students need to learn to appreciate context and avoid blindly applying theoretical insights. In the agility example, they may be persuaded to say agility is a 'fad' and that the teams and groups research highlights what is important for teams to operate effectively. First, denying what organizations believe is important tends not to help constructive conversation. Students need to relate to the practitioner. If agility is a recognized concept in the organization and socially shared knowledge, this contextual information is relevant. Students need to speak the practitioners' language while maintaining the connection from what they know from theory, despite differences in the concepts of practice and science.

Conversations between students and practice introduces each to different languages. Translation is needed to create mutual understanding and helpful students comprehend differences in viewpoints. It also helps them to communicate more clearly, avoiding scientific jargon the practitioner would not be familiar with. Translating theory to practice is like translating meaning from one language to another. In the act of translation, the main goal is to convene a message in such a way that one stays as close as possible to the initial meaning, but it's not merely a literal translation. In Italian, 'vado a fare un giro' would translate into 'I go make a tour. Yet, what is meant is I go for a walk. When translating, some of the meaning is often lost, as is the case in complex emotions which don't translate well in every language. In the agility example, students would learn context from the practitioner video and come to understand the industry the organization is working in, how many employees there are and their roles or functions in the organization. The practitioner would also give examples of what agile work is and how it is understood. It is this information that is useful for learning the practitioner's language. The jargon and abbreviations students are learning can be organization specific or specific to a field of human resources or management (e.g. KPI's, EBITDA).

Context also informs how an organization works and operates. It means different things whether an agile team structure is situated in a healthcare setting or a tech startup. Students learn about theorizing on teams and groups but don't necessarily realize how these learnings translate in practice. A hospital operates and is structured differently than a tech startup. Hospitals require nurses to report to head nurses but also to physicians. It's a delicate balance in hierarchical lines, where nurses would report to multiple hierarchies. Translating team and group research to a hospital context would need to take this into consideration. Tech startups would be flexibly structured, where norms are more fluent. Appreciating and understanding the context in which theory is applied is important for students to adjust their translation accordingly. In courses, students would engage in conversations with the client to understand the organization and how the work is being done. This certainly helps to ask deepening questions for elaborating on diagnosis and understanding the specific context. Through feedback in their assignments students also are guided in which questions to ask, pointed to contextual

features they may have missed, or if they don't take the practitioner's perspective and continue speaking their own scientific language.

Another relevant aspect linked to context is that practice often seems to emphasize the particularities of an industry or type of organization. Although context is important, human behavior also shows universal patterns and can be fundamental regardless of the type of industry people work in. Hence, even though contextual uniqueness is often stressed by organizations, such as in government institutions or education, students will need to learn to identify if these differences truly matter or that scientific evidence from other industries can equally be informative. For example, employees' feelings of unfairness would derive from the same theoretical factors in labor workers, as they would for employees in high tech companies. What is relevant though is to understand how the predictors of (un)fairness are represented in the company. Is interpersonal fairness, or the respect managers have for employees relevant here, or is it the case that some employees are treated differently than others and reave more of the benefits (that is, process fairness)? Hence, whether the psychological processes may be fundamental to humans, the representation of these processes is unique in a company. How can students learn when context is important for their question? Through searching for high quality scientific evidence, students can be guided towards industry-specific differences. If research focused on their diagnosed question shows important differences in industry this can guide practical application. If industry is found to be less relevant, this is equally informative.

Other Skills to Support EBMgt

A third dimension in our curriculum advances student professional skills. The skills of listening and communication is the primary focus in EBMgt's first A, Ask: To listen to the client's question and needs, create a good relationship, and constructively work towards shared understanding (e.g. Kluger & DeNisi, 1996).

The Skill to Listen

Students practice with video cases in the Bachelor year while in the Master years they work with actual clients to help them resolve issues or problems in HR and management. Key in diagnosing the problem effectively is careful listening to understand the client's problem. Perhaps the hardest part for students is not jumping right away to a solution. They need to keep an open perspective in which they take in all the information, ask additional questions and gather new information to lay out the puzzle first before discussing next steps. To listen first is hard for students because offering solutions feels like it would build client confidence in their ability. And, asking questions without offering opinions can make them uncomfortable as they fear giving the client the impression there is nothing on offer. It is important to address these fears students have head on, so they can learn to focus on the client's needs and not their own.

The Skill to Connect and Build Trust-based Relationships

Careful diagnosis requires a good relationship and connection with the client to get as much information as possible and to ask honest but difficult questions. Connecting with the client through mutual trust allows for more complete information sharing, to consider each other's opinion, to allow each to update one's assumptions, and keeping an open mind (Costa, Fulmer, & Anderson, 2018; Schoorman, Mayer, & Davis, 2007). In coursework, students are guided to create a high-quality mutual exploration process between themselves and the client. This process allows for exchanging information, asking additional questions, posing hypotheses or alternative explanations. It nurtures the client relationship by showing genuine interest in understanding. By building the client relationship first, students are better positioned to offer new insights and perspectives, even questioning the actual priorities of the client in order to better focus on problem solving. Students work in groups to prepare for the first meeting, allowing sufficient time to learn about the organization and which questions to ask.

Empathic Communication

In connecting with the client, empathetic communication is key. Keith Murnighan in his book 'Do Nothing' (2016) mentioned his Leadership Law, which he defined as a process in which you would try to take the perspective of the other person to create a message that is comprehensive and clear (and actionable). People tend to communicate from their own perspective, choosing words and emphases they believe are important. Yet, it's the other – the client's - perspective that is more important. Students need to learn how to create an argument, to reverse-build towards a conclusion by starting with their main message, and then unpacking how they got to the conclusion. Students need to first explain it to each other, as if they were speaking to a friend in order to understand when to use jargon or to translate an idea into plain language.

Students receive feedback in building this skill in a variety of ways: through their presentations in which they deliver results of a CAT assignment and in their communication with clients and in mentoring sessions during their internship. Their CAT assignment is based on the practitioner videos. After students diagnose the problem, they focus on acquiring and appraising relevant scientific evidence. By developing a CAT, they learn to concisely describe their findings and call attention to their level of trustworthiness. Particular attention is given to adequately choosing the right appraisal language for communicating the trustworthiness of the findings. In the initial writing of the CAT students are inclined to treat all scientific evidence as equally important in their conclusions regardless of the suitability of a study's design. EBMgt shows how to be consistent in one's language and appraisal of a study, by giving example sentences. For example, on how to describe findings for a RCT ("it is shown that…") or a survey study ("there are signs that…"). This helps students to adjust or use the language consistent with the trustworthiness of study results. Students often need to learn

this and through feedback students learn how to describe scientific evidence more accurately (e.g. Benson, Cohen, & Buskist, 2005). Apart from appraisal language, effect size tends to be neglected in students' first EBMgt experiences. Gradually, they learn to be careful in choosing language consistent with study design and take into account the size of the effect and not just whether a result is statistically significant. Nonetheless students need to be guided through this process, and through repeated practice can be reminded of what they have learned. It is through use of different tools that we hope to provide for such repeated practice.

Tools to Support Learning

Several tools can help students learn more effectively. In the first place, an EBMgt checklist can guide the process and their completion of assignments. An EBMgt checklist is introduced to students helping them see where to start in the process of applying EBMgt and all its steps. Assignments help students gain experience in each of the different types of evidence and the six A's (Ask, Acquire, Appraise, Aggregate, Apply and Assess). Assignments also help track student progress and determine where they have difficulties where to offer support and guidance.

EBMgt Checklist

Checklists were introduced long ago for pilots and medical staff to enhance diagnosis and to enhance safety procedures (Degani & Wiener, 1993; Ely & Graber, 2015). Checklists function as extended memory to help recall important actions and structure the order in which tasks should be performed. The application of EBMgt using the six A's for each of the four types of evidence can seem overwhelming. Students introduced to EBMgt benefit from guidance regarding how and where to start and which steps to take next. This is why a checklist (Appendix A) is offered to students for using EBMgt in a practical problem.

Applying EBMgt involves considering many steps and can be frustrating if the order of those steps is not clear. End-users find this checklist to be useful rather than a box-ticking procedure. The checklist stresses the autonomy a user has to skip steps depending on practical considerations or what is found needed to resolve a problem situation. For example, in practice, time constraints may not permit gathering stakeholder evidence. The decision can be made to not take this into consideration. Ultimately, it's the decision-makers responsibility to come to a high-quality decision, informed by the available evidence. Despite the fact that EBMgt encourages all types of evidence, practical constraints may not always allow this. In other words, even though the checklist contains all the information needed to perform a EBMgt, it still allows for individual discretion. At the same time, it also fulfills the role of documenting the choice process. Documentation is helpful for personal records but also for tracing back when one would want to see why a particular decision was taken. Finally, it also functions as a learning guide, cataloging previous decisions to reflect on what could have been done

differently. In student assignments the checklist performs an additional role. It is helpful to see how students handled an assignment, how they approached each of the 6 A's in the EBMgt cycle, what they considered and what not. This information can generate conversation with students to give feedback or discuss possible obstacles and ways forward.

Assignments

Assignments in various courses help create experience in practicing EBMgt. Because EBMgt is gradually introduced over bachelor and master years, the complexity of the assignments increases. Through CAT assignments students incorporate scientific evidence, working on Asking, Acquiring, and Appraising. Later, evidence from practitioners/expertise is added. Students are then required to look at Asking, Acquiring and Appraising both scientific and practitioner evidence, and aggregating them before reaching conclusions.

Practicing EBMgt: Critically Appraised Topic (CAT)

The CAT assignment (Appendix B) is used to help students practice with the different types of evidence. Initially students only consider scientific evidence, but gradually other types of evidence (practitioners/expertise for example) are also included as they move through the curriculum (see Table 1 for an overview).

Questions for the CAT are delivered in different formats as the interactions with the organization gradually increase. For example, in the Bachelors program, students receive videos where HR managers outline a problem. Here, the focus is primarily on scientific evidence. Students only work with the information in the video or available on the organization's website. This is chosen to focus student learning, allowing them to choose a topic (e.g. leadership, groups, motivation) that they find interesting. Each topic links to a practitioner video in which a problem is linked with that topic (e.g. malfunctioning leadership, or introducing leadership coaching in the organization).

To construct the videos, practitioners are invited to introduce a problem situation on a topic relevant to their organization. For example, if an organization has been going through change recently, a question on the topic of change processes could be introduced. What is exciting in this format is that practitioners would not just present the question but also add complexity to the question. For example, by asking additional sub-questions, linking to a particular concept or jargon they have in-company or by detailing a specific population they have in mind for the question. For students this poses an additional challenge as they would need to bring the question to its essence and see which aspects are relevant for contextualization or for deepening the question itself.

Later in the Bachelors program, students are also introduced to practitioner/expertise evidence. Here, they take part in practitioner workshops on topics such as recruitment, or coaching. In the CAT paper not only do students consider scientific evidence on the topic but

now also practitioner/expertise evidence. That evidence is presented in the workshop they followed. Hence, students will appraise the workshop presenter's information with respect to aspects such as the presenter's experience, opportunity to practice, or learning from feedback to monitor and adjust performance.

In preparing the CAT assignments students receive guidance through check-in sessions where they receive feedback. One of problems they face is consistent with what is discussed earlier concerning diagnosis, that is, pinning down the essence of a question. Another issue often seen is that significance and relevance is equated, not taking into account effect size, or adjusting language to the design. Through feedback, students are reminded of the appraisal of a study, and how they should report its findings, including the size of the effect in their description of the results and conclusions. Again, repetition is needed.

EBMgt in Practice

A second exercise introduced in the Masters years is a client assignment. Students need to diagnose, examine scientific evidence, look for relevant organizational and stakeholder data or collect it themselves to develop a recommendation. Organizations are invited to submit a proposal for a problem statement they would like students to work on. Proposals vary widely such as onboarding manuals, cross-cultural differences in ways of working, or a project on motives for employee voluntary turnover. Students engage in regular meetings with the client to understand their needs and the context of the problem. The exercise is meant to go beyond mere practice for students but to also benefit the client with solutions or implementations. For this exercise, data must be available or can be gathered. The type of data collection needed for organizational and stakeholder data depends on the question, what is already available (e.g. satisfaction surveys, or sales data), and the possibilities of new data gathering within the organization. Students might run a survey, interview employees, or organize focus groups to acquire organization and stakeholder evidence. In this context, students learn about organizational and stakeholder evidence through acquiring and appraising, which involves developing their skills of listening and communicating. To help students with this process, they work in groups, guided by a mentor who supports them through the exercise by providing assistance in acquiring and appraising the different kinds of evidence. In addition, students aggregate the different types of evidence to present a plan for application based on their results. They present their final results to the client, which concludes the assignment. An important aspect in this assignment is that instructors need to engage in thorough pre-work with organizations to manage mutual expectations of what students can and cannot do, but also what is required of the organization in terms of opportunities for data (accessibility or collection) and a planning that is consistent with the course structure.

Finally, there is the internship in the 2nd Masters year. Students work four out of five days full time with a company for seven months. The work is not paid as it is part of the Masters program. Internships vary from working in generalist HR, consultancy, learning and devel-

opment or recruitment and selection. Students perform a function with their responsibilities specified in a job description to avoid them merely doing routine work. They work on a particular project from start to finish to connect with EBMgt and its application. Projects fit with job functions and vary widely, from helping implement a new software system organization-wide, developing a leadership training, or establishing a diversity policy. Every company submits projects for students to work on. Before students can apply for an internship, instructors review and approve the project. Students are guided in their internship with a mentor in the organization and university staff. One day every two weeks students come back to the university to discuss their progress in small groups. They discuss general progress, challenges and opportunities as well as the process and content of their project. Students engage with the 6A's for each of the four types of evidence, aggregate the evidence, apply and assess the implementation. Since the projects vary considerably, students present their progress in the project to their peers to monitor how they are doing and correct if necessary. The internship concludes with a written report of the students' undertakings as well as a description of the project's process and outcome.

An important challenge is to encourage students to apply what they've learned in their Bachelor and Master years. Once they start their internship and feel pressured to meet objectives, students tend to take short cuts, forgetting to think critically about their work and its results. The practice environment often fails to encourage reflection. For this reason, we convene biweekly meetings with students at the university to discuss these issues and to guide students in how to have a constructive conversation with their organizational mentor. Students don't always have the confidence to proactively engage in these conversations and the feeling of being supported by the university to do so helps them take this difficult but important step. Ultimately, it is through continued guidance from the organizational mentor and university staff that students are encouraged to keep learning and developing to prepare them for the transition from university to the job market.

Different Accents in Programs

Even though EBMgt benefits all students, individual students have different needs depending on the program they are in. Bachelor and Master students psychology are instructed to EBMgt in a gradual and logical way. They have very little experience with practice and a limited understanding of what organizations are and how they operate. Throughout their third and final Bachelor year an integrated curriculum approach guides them to systematically grow in practicing EBMgt. They start out with a general EBMgt background, gathering and assessing scientific and practitioner evidence. In the first Master year they practice with stakeholder evidence and organizational data, whereas in the final Master year (the internship primarily) the entire EBMgt cycle is integrated. Thus, there is a lot of opportunity to practice in a paced way, and gradually add complexity.

Students following a postgraduate program often do not have the time for the full scope of EBMgt. Programs are shorter and tailored to the job. They also have different needs as they work full time. For example, students who are enrolled in the psychosocial prevention advisor program (a government required program for prevention advisors in organizations similar to safety prevention but here concerned with psychosocial risks) primarily are interested in interventions for situations they frequently encounter or are currently facing. For example, a formal complaint has been filed of a worker who was bullied by their supervisor. Here, the prevention advisor must diagnose the situation and advise a solution. The solution could be related to the case itself but also could contain elements organizations would need to change on a policy level. These students hence are much more focused on learning actionable and usable knowledge and interventions.

Offering actionable interventions from scientific evidence can be challenging. Even though it is valuable to gather relevant scientific evidence from systematic reviews and meta-analyses to quickly see what works, these sources often fail to specify how to conduct the intervention. Often peer reviewed journal articles reporting RCT designs fail to describe the full details of an intervention, making it hard for participants to know what they could advise the organization or to build an intervention. Yet, it is this type of procedural (how to) information students would be interested in.

Postgraduate students in this class are assigned a presentation based on a case where they must search for scientific evidence to inform what works as a solution to the case. For example, in the case above, students would seek evidence about antecedents of supervisor bullying, consequences of bullying but also would look for interventions that could remediate the situation. They choose the case themselves. It can be a real-life case they are currently working on but the case can also be adjusted to make it less complex so the exercise becomes easier. Since, it is students' first experience with EBMgt and looking for scientific evidence making a case easier by removing information (e.g. another layer of complexity) can be helpful to learn the principles. For example, in a case of an employee bullied by his supervisor, one might ignore the fact that the supervisor was recently hired because he was part of the owner's family. Students come from a variety of backgrounds such as psychology, but also other domains such as economics, engineering, or law school. Given the diversity in backgrounds, the instructor must offer sufficient guidance to help students translate practitioner problems, concepts and jargon to known concepts in the literature. Conceptualizations in the literature and organizations are not always similar and sometimes even confusing if they share the same name but are different in how they are conceptualized in practice and research. For example, authenticity and engagement are terms often used in organizations but both can be interpreted in many different ways and not always align with the scientific literature. Teaching students to make these *translations* is often not easy as it requires a more deep and elaborate understanding of the field. To see connections of theoretical concepts and definitions seems indispensable to search the literature more effectively.

While EBMgt invites students to examine relations to a problem, how these relations are organized in domain knowledge is often less emphasized. A deeper understanding of these relations may be obtained when learning about what is known in a domain (cf. programmatic theory)(Cronin, Stouten, & van Knippenberg, 2021). What is known constitutes the overall picture of how something works. For example, how does performance feedback work, what is needed to deliver effective feedback? Systematic reviews and meta-analyses show insights in the factors that contribute to effective feedback. What is not always done is to integrate these findings in a larger framework to get an overall understanding of how things work. Such knowledge helps students to understand the full picture of the problem situation, as being on the top of a hill overseeing the valley, to capture a fuller comprehension of which interventions may or may not work.

In Sum

This chapter described the way students in different programs may benefit from EBMgt. EBMgt not only allows students to learn the principles but also triggers their critical thinking. Where they once were more easily persuaded by single study reported in the media, they learn the skill to examine what is claimed and whether it is substantiated. Students would ask more questions if something is right, even critically examining general OB handbooks in which findings of single studies are sometimes discussed as general knowledge. Will our interns be sufficiently equipped to counter the conventional wisdom of practice? Only time will tell. But we hope our students would be the seed to let EBMgt grow more structurally in organizations.

As for postgraduate students, they see invaluable benefits in EBMgt. Knowing how to search the scientific evidence and quickly get an idea of what evidence shows provides a process students can replicate and use. It also allows them to deliver pitches to EXCO more effectively backed up by a more thorough understanding of their case, but also possible interventions and their estimated impact.

Students learn to avoid generalizing from a single study's findings, being more nuanced, avoiding fads, and questioning anecdotal evidence. It helps them to embed nuance and develop a language that matches the trustworthiness of findings to a problem. It offers them communication skills to professionally assess and evaluate evidence, but also to constructively work with peers and management on a course of action. These skills are critical in their professional life and contribute to the professionalizing – wisdom and honesty - of HR and management.

References

Barends, E., & Rousseau, D. M. (2018). *Evidence-based management: How to use evidence to make better organizational decisions*. Kogan Page.

Benson, T. A., Cohen, A. L., & Buskist, W. (2005). Rapport: Its relation to student attitudes and behaviors toward teachers and classes. *Teaching of Psychology*, *32*(4), 237–239. https://doi.org/10.1207/s15328023top3204_8

Costa, A. C., Fulmer, C. A., & Anderson, N. R. (2018). Trust in work teams: An integrative review, multilevel model, and future directions. *Journal of Organizational Behavior*, *39*(2), 169–184. https://doi.org/10.1002/job.2213

Cronin, M. A., Stouten, J., & van Knippenberg, D. (2021). The theory crisis in management research: Solving the right problem. *Academy of Management Review*, *46*(4), 667–683. https://doi.org/10.5465/amr.2019.0294

Degani, A., & Wiener, E. L. (1993). Cockpit checklists: Concepts, design, and use. *Human Factors*, *35*(2), 345–359. https://doi.org/10.1177/001872089303500209

Ely, J. W., & Graber, M. A. (2015). Checklists to prevent diagnostic errors: a pilot randomized controlled trial. *Diagnosis, 2*(3), 163–169. https://doi.org/10.1515/dx-2015-0008

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, *119*(2), 254–284. https://doi.org/10.1037/0033-2909.119.2.254

Murnighan, J. K. (2016). *Do nothing!: Discover the power of hands-off leadership*. Portfolio.

Schoorman, F. D., Mayer, R. C., & Davis, J. H. (2007). An integrative model of organizational trust: Past, present, and future. *Academy of Management Review*, *32*(2), 344–354.

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Appendix A: EBMgt Checklist

Authors: CEBMa, Lieven Brebels, Jeroen Camps, and Jeroen Stouten. The checklist was developed based on the Barends and Rousseau (2018) complemented with research in relevant fields such as forecasting and expertise literature.

"Ask whether checklists are used; if the answer is 'no' or not forthcoming, choose a different hospital." – Gerd Gigerenzer

These steps are meant to guide you through the different EBMgt stages. They are intended to help you reflect on the different steps that can be taken in the EBMgt process to guide your decision. Going through the different steps also helps you document which actions you have taken and which decisions you have made along the way. This way, when looking back at decisions the protocol acts as a memory and archival system and allows to learn from previous decisions.

1.1. Define your question using the PICOC to identify if your question is sufficiently clear and detailed.

Answer each of the questions in light of the problem or question you wish to answer:

Population	Who?	Which employees does it concern?
Intervention	What or how?	Management technique/method, variable
Comparison	Compared to what?	Alternative treatment or intervention, variable
Outcome	What are you trying to improve or change?	Objective, purpose, goal
Context	In what kind of organization/ circumstances?	Type of organization, sector, relevant context

In the following parts, your question will be documented based on the different types of evidence and each of these will be appraised. But first you can examine whether you have sufficiently deepened your question to be able to acquire relevant evidence.

1.2. Deepen the question further: Ask yourself:	✓	Unclear
• Is the question sufficiently clear and specific?		
• Is this question a priority to the organization? Ask yourself what is the worst and best possible outcome of the situation. • Should this question be addressed before any others? If applicable, use a priority ranking based on management plans.		
• Is the question tapping the actual problem or is it merely a symptom (i.e., are there other underlying problems)?		

2.1. Ask others to help understand the question and possible solutions:	✓	Unclear
Evidence from experienced practitioners (e.g., highly experienced managers or employees) in your organization:		
Acquiring evidence from practitioners: who to ask?		
• Determine how many experienced practitioners you would like to inquire; more input will add accuracy: • If many experienced practitioners are available, draw a random or a stratified sample for selection: how did you define the sample?		

continued

2.1. Ask others to help understand the question and possible solutions: *(continued)*	✓	Unclear
• Make a list of experienced practitioners who have frequent opportunity to practice or opportunity to be confronted with the problem situation a. How many experienced practitioners can be identified? Assess their expertise in terms of: i. How frequent they have the opportunity to interact with the problem situation ii. Whether they have the opportunity to practice within a predictable and defined scope of the problem environment to ensure that a limited number of factors or actions could be taken (a highly complex situation makes it very hard to see what works and what doesn't). iii. Whether they have received (objective) feedback on each of these opportunities iv. Whether they reflected on alternative actions leading to the same outcome in the problem situation to assess whether the perceived actions were indeed impactful v. How open they are to new insights and experiences, and to updating their beliefs when new information is offered b. Evaluate if there is sufficient diversity in opinions or perspectives among practitioner experts. If not, consider including other experts. c. For archival purposes, document the process and how you selected practitioners		
• Collect input from the sample of experienced practitioners regarding the **question**: • Focus on: ▪ What practitioners see as the main problem? ▪ Whether they see additional or underlying problems? ▪ Whether they agree with the problem description? ▪ Whether they agree with the seriousness and putting priority on the problem? ▪ If possible, allow practitioners to estimate the worst and best possible outcome (to understand the confidence with which they make a judgment).		

continued

2.1. Ask others to help understand the question and possible solutions: *(continued)*	✓	Unclear
• Determine whether to use a survey or Delphi method (see book p. 56) ▪ Pilot test your chosen method ▪ Allow practitioners to consider multiple options. ▪ When using the Delphi method allow them to challenge assumptions ▪ Ask for additional evidence that can be offered		
• Collect input from the sample regarding possible **solutions**: • What are possible solutions? • Do they agree with these solutions? • Are there downsides or undesired consequences? • Do they see alternative solutions? • Are the suggested solutions sufficiently clear (what, who, where, when)? • What are possible costs/benefits for the different solutions? • How practically feasible are the solutions?		
Appraising evidence from practitioners: Evaluate accuracy		
• Evaluate consensus among practitioners		
• Evaluate whether practitioners have extensive and frequent experience with the problem situation		
• Were practitioners able to bring in relevant evidence, and/or evaluate the outcome (through objective feedback) of own actions?		
• Evaluate whether evidence was acquired in a reliable way?		
• Evaluate practitioners' estimates in terms of (dis)agreement		
• Evaluate possible bias in practitioners' judgments and estimates		

continued

2.2. Ask others to help understand the question and possible solutions:	✓	Unclear
Evidence from stakeholders		
Acquiring evidence from stakeholders: who to ask?		

• Define the stakeholders by using the stakeholder map based on:
  • Who is directly affected by the problem situation or decisions that flow from the problem situation?
  • Who is indirectly affected by the problem situation or decisions that flow from the problem situation?		

• Determine the stakeholders from the stakeholder map based on their *interest* in and their influence on the problem situation:
  • Who could affect the decision?
  ▪ What are their interests and concerns?
  ▪ How much influence do they have?
  ▪ Do they have legal rights?
  ▪ How could they affect decisions and/or the implementation?
  • Who could be affected by the decision?
  ▪ What are their interests and concerns?		

• Evaluate whether the stakeholder group is sufficiently large and representative		

• Decide on the method to acquire information:
  • Survey
  • See also https://measure.whatworkswellbeing.org/resource-list/
  • Structured interview
  • Focus group		

• Gather stakeholder evidence on the **problem** situation:
  • Do the most important stakeholders agree with the problem definition?
  • Do they see plausible alternative causes?
  • Do they agree with the possible consequences?
  • Do they see additional possible consequences?
  • Do they agree that the problem is serious and urgent?		

continued

2.2. Ask others to help understand the question and possible solutions: *(continued)*	✓	Unclear

• Gather stakeholder evidence on the **solution** (if available already):
  • Is the solution clear (the what, who, when and where?)
  • What are potential benefits of the proposed solution(s)? What are potential costs, downsides or undesired consequences of the proposed solution(s)?
  • Do they see alternative solutions?
  ▪ What are potential benefits of these solution(s)?
  ▪ What are potential costs, downsides or undesired consequences of these solution(s)?
  • Which solution do they see as the 'best' or 'most feasible'?
  • Are stakeholders supportive of the solutions?
  • How critical is their support for effective solution implementation?		

Appraising evidence from stakeholders		

• Is the information from stakeholders consistent with all the stakeholders' views?
  • Was the sample representative?
  ▪ Compare stakeholders with the population regarding: age, gender, ethnicity, level of education, income, occupation, function, position, tenure, full-time/part-time employed.
  • Could there be selection bias?
  • Were stakeholders free to speak, and were all concerns given equal chance of discussion?		

2.3 Evidence from the scientific literature	✓	Unclear
Acquiring evidence from the scientific literature		
Acquiring evidence from stakeholders: who to ask?		

• Search
  • Define key search terms based on PICOC
  • In defining key terms, consider if there is a broader underlying principle
  • Include alternative terms (e.g., by using the Thesaurus)		

continued

2.3. Evidence from the scientific literature *(continued)*	✓	Unclear

• Filter
  • Filter for peer-reviewed articles
  • Filter for meta-analyses and/or systematic reviews and/or randomized control trials
  • Consider limiting results by adding extra PICOC terms and/or limiting the date range (or broadening filters if necessary)
  • Consider limiting the search (e.g. restricting the number of years or type of industry) based on the highest possible quality of evidence available		

• Document the search flow to easily replicate later and for documentation purposes		
• Which causes for the problem are suggested by the scientific literature?		
• Does scientific evidence give insights into the effectiveness of possible solutions? If not, a separate search is necessary towards solutions.		
Appraising evidence from the scientific literature		

• Determine the initial trustworthiness of the findings:
  • What is the trustworthiness level of the findings based on the type of question and study used? (AA, 95%, A, 90%; B, 80%, C, 70%; D, 60%)
  • See Methodological appropriateness in OLI module 7 or Table 7.5 in the book
  • Adjust the rating one level up if the design is a meta-analysis or systematic review		

• Possible limitations were examined:
  • In a meta-analysis or systematic review:
  ▪ Is it likely that relevant studies were missed (e.g., using one instead of multiple databases)?
  ▪ Is study selection and appraisal not clearly documented?
  ▪ Was the methodological quality of the studies not assessed?
  ▪ If the question is on cause and effect, can cause and effect be established based on the findings?		

continued

2.3. Evidence from the scientific literature *(continued)*	✓	Unclear
• In a randomized control trial: ▪ Where the groups not fully randomly allocated? ▪ Was the control group different from the intervention group at the start of the study? ▪ How many participants dropped out (e.g., 20% of the participants drop out)? > If there was dropout, were participants who dropped out different to those remaining in the study? ▪ Were measurements insufficiently reliable or valid? ▪ Could there be potential trainer or Hawthorne effects (e.g. did the control group receive no training? Did control and intervention groups have different trainers)?		
• In a non-randomized controlled before-after study: ▪ The same questions as for an RCT. ▪ Did the study start only AFTER the intervention? ▪ Were there other changes or circumstances at the time of the intervention?		
• In a before-after study: ▪ The same questions as for a non-randomized controlled before-after study ▪ Is there possible selection bias? ▪ Were results reported on all measured variables (as opposed to only the variables that affect the intervention)?		
• In a correlational study: ▪ Is there possible selection bias? ▪ Is it possible that the study used data dredging? ▪ Were measurements insufficiently reliable and valid?		
• In a qualitative study: ▪ Is it possible that the researcher was biased? ▪ Were some questions suggestive or indicative? ▪ Is there possible selection bias? ▪ Was data collection insufficiently described? ▪ Was the data analyzed by only one researcher?		

continued

2.3. Evidence from the scientific literature *(continued)*	✓	Unclear
• Determine the practical relevance of the findings by using effect sizes.		
• Determine how precise the findings are by observing Confidence Intervals (if available).		

• Determine the correct wording to refer to the findings based on trustworthiness level, practicality and preciseness:
  • A: "it is shown that…"
  • B: "it is likely that…"
  • C: "there are indications that; it could be that…"
  • D: "it is possible that; …"
  • D-/E: "it is unlikely that…"		

• Determine the general understanding and pattern of the findings based on programmatic theory.		
• Determine if the evidence is generalizable to the specific context?		

2.4. Evidence from organizational data (turnover data, productivity, employee surveys, …):	✓	Unclear
Acquiring evidence from organizational data		
• Is there data available that allows you to answer your PICOC?		
• Do the data confirm the problem?		
• Do the data confirm the cause (i.e., the relation between cause, the process explaining the cause and the consequences)?		
• If a trend-analysis is needed allow for sufficient (three or more) data points.		

• Gather evidence on the **solution** (if available already in the data):
  • Can data be used to monitor future effectiveness of the solution?
  • Can solutions be found to resolve the problem situation within the data?
  • Can costs and benefits be clearly estimated?
  • Do the data agree on the solution as the 'best' or 'most feasible.'		

continued

2.4. Evidence from organizational data (turnover data, productivity, employee surveys, …): *(continued)*	✓	Unclear
Acquiring evidence from organizational data		

• Determine the accuracy of the data:
  • How were the data acquired?
  • How were the data processed?
  • Was the interpretation based on accurate rules and guidelines?		

• Evaluate the size of the data sample, is the small number problem likely?		
• Is there a trend over three or more data points that shows the seriousness of the problem?		

• Determine the initial trustworthiness of the findings:
  • What is the trustworthiness level of the findings based on the type of question and study used? (AA, 95%; A, 90%; B, 80%, C, 70%; D, 60%).
  • See Methodological appropriateness in OLI module 7 or Table 7.5 in the book.		

• Determine possible limitations (for an elaboration see 2.3 scientific evidence) and adjust the trustworthiness if needed.		
• Determine the reliability of the data – estimate measurement error: • Are the data based on direct/objective outcome measures or indirect/subjective measures?		
• When a change or difference in the form of a percentage is presented, is it clear whether this involves a relative change or an absolute change?		
• When an average is presented, is it clear what the standard deviation or the confidence interval is?		
• When a graph is presented, does it facilitate accurate interpretation? • Is there a baseline on the axes? • Do units on the axes represent equal steps? • Do the numbers add up? • Also consider the following: • Does the graph present missing data? • Does the graph present cumulative data?		

continued

2.4. Evidence from organizational data (turnover data, productivity, employee surveys, …): *(continued)*	✓	Unclear
Acquiring evidence from organizational data		
• Is the effect size (e.g., R2) practically relevant?		
• Determine how precise the findings are by using Confidence Intervals (if available).		
• Consider the possibility of prosecutor's fallacy, base rates.		
• Determine whether the findings are generalizable to the specific PICOC context.		
• Determine if the data needs to be put into context (e.g., industry comparison).		

3. Aggregate	✓	Unclear
• Determine the prior based on available evidence, otherwise .50.		
• Gather the probabilities of the different types of evidence and obtain the final probability.		
• Is there evidence that stakeholders consider the solutions to be feasible?		
• Is there evidence that stakeholders are supportive of the solutions?		

4. Solutions	✓	Unclear
• Determine possible solutions from the types of evidence.		
• Gather the probabilities and obtain the final probability for the solution or multiple solutions.		
• Determine the expected value for the solution(s) = P1 * cost-benefit if true 1 + P2* cost-benefit if false.		
• Consider ethical issues such as beneficence, respect, justice, deontology.		
• Consider possible moderators at play		

continued

5. Assess	✓	Unclear
• Consider setting up an experiment or sandbox to test and adjust.		
• Did the implementation contain all relevant elements of the solution.		
• Consider the duration, frequency, and coverage of the implementation.		
• Determine how to assess the results of the implementation: Randomized control trial; quasi-experiment; before-after study; after action review.		
• Set up a monitoring and adjustment plan.		

Appendix B: CAT ASSIGNMENT

Each group will develop a CAT about a specific topic. The topic is briefly presented in the class schedule but is more precisely formulated in a video.

Two groups will make a presentation of their CAT in the week we discuss theory about that topic. Moreover, each group will also develop a CAT in written format (the CAT paper). A Critically Appraised Topic (CAT) is a structured, short (3-4 pages max) summary of evidence on a topic of interest, usually focused on a practical problem or question.

CAT Presentation

The presentation starts from a practical problem or question. Your goal is to do a Critically appraised topic (CAT) from this problem or question. In order to do that you need to search for relevant literature, read and select and appraise the literature in order to see how it can help your problem. From the results you get, you will select adequate practical advice or solutions. Hence, you apply what you learned in the EBMgt course on the problem that is presented to you.

You will present your presentation in the class where your group is scheduled.

How to Start?

A good way to start is analyzing your PICOC:

POPULATION	Who?	Type of employee, subgroup, people who may be affected by the outcome
INTERVENTION	What or How?	Management technique/method, factor, independent variable
COMPARISON	Compared to what?	Alternative intervention, factor, variable
OUTCOME	What are you trying to accomplish / improve / change?	Purpose, objective, dependent variable
CONTEXT	In what kind of organization / circumstances?	Type of organization, sector, relevant contextual factors

The presentation covers the following aspects:

1. What is the background to the question? How was it chosen? Why? [if you have information on this]
2. What is the review question (or questions)? What is the PICOC?

3. What types of study were considered relevant and why?
4. What search strategy was used and why?
5. What, if any, are the preliminary results? Including on how you appraised the literature in terms of its reliability.
6. What problems or pleasant surprises have you encountered so far?

Some tips and tricks:

- Answer this question: "What is it you want the audience to learn and remember from your talk?" This is the crucial point and everything that follows is in function of this goal. Your arguments will need to be aligned with that message (or story if you will) that you are bringing. This message needs to create interest, enthusiasm, and a willingness to listen to your talk.
- Another thing is the message or story needs to be logically structured. It needs to be easy and logical to follow. Think of it as a guide in a museum. The visitor is ignorant, she might not even be that interested in visiting the museum. But the guide brings a story that is instilling enthusiasm. And the story is logical, it is built from the beginning and gradually it increases in complexity and richness. The guide never loses touch with the visitor to sense if something is not understood. The guide watches closely and makes the visit as worthwhile as it should be to become a memorable experience.
- It's important to be critical, when appraising the literature, examine the **strengths and weaknesses** of theorical evidence.
- Beware that time can be an issue: both in professional and academic settings, people expect you to keep track of time. Therefore, **appoint a time-keeper** in your team who can signal the presenters if and how much they run out of time.
- The presentation is a first trial to produce the CAT paper, hence, it need not be flawless but your best work up to that point. You can further refine and adjust the content for the CAT paper.

> *The presentation is not meant to be in the format of the 'evidence-police'. Try to empathize with the one who gave you the assignment for this particular problem or situation and present your message in the best possible way that it will ring a bell and be heard in your audience. When your audience is alarmed due to your overly critical and judgmental tone, it will not have the impact you want it to have. Hence, your presentation tone and format is as essential as the content.*

CAT PAPER

Following the guidelines to perform a CAT. Many of these aspects you already practiced when learning about the principles of EBMgt, you will now combine these around one specific question or problem.

THE PAPER SHOULD BE NO MORE THAN 3-4 PAGES (1.5 SPACING, FONT CALIBRI 10 OR TIMES 12). THIS EXCLUSES APPENDICES AND REFERENCES.

Key parts of your CAT include:

1. Background
2. Question
3. Inclusion Criteria
4. Search Strategy: Document the search and include the details in an **appendix**
5. Study Selection
6. Data Extraction and Critical Appraisal

   Detail this process in an **appendix**. This also means identifying the trustworthiness of the studies based on the used methodology and on possible research flaws.
7. Results
   - 7.1. Definitions
   - 7.2. Causal Mechanism
   - 7.3. Main Findings
8. Conclusion
9. Limitations
10. Implications and recommendations
11. References

Teaching Evidence-Based Management to Graduate Students in a Master's Healthcare Administration Program

Ruiling Guo, Lori R. Austill, Richard Ginnetti, and Liang Yan

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Teaching Evidence-Based Management to Graduate Students in a Master's Healthcare Administration Program

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Healthcare leaders and administrators in the current United States healthcare environment are facing many challenges in improving quality patient care and reducing high healthcare costs in their organizations. To meet the challenges of this fast-changing field, the researchers believe that it is extremely important for academic programs and faculty in the Healthcare Administration discipline to teach graduate students the evidence-based management (EBMgt) model. This model will better prepare the next generation of health leaders and administrators to apply EBMgt knowledge and skills for making competent decisions, which may result in positive impacts on their future healthcare organizations. This chapter presents our experiences teaching evidence- based management skills to graduate students in the Master's Healthcare Administration Program (MHA) at Idaho State University's College of Business. The rationale for teaching EBMgt, the content and teaching methods, and the assessment of EBMgt learning outcomes are shared and discussed in this chapter. Through EBMgt education and hands-on exercises, our graduate students increased their EBMgt knowledge, skills, and confidence in applying EBMgt to decision-making in healthcare settings. Our pre- and post-assessment results demonstrated the impact of effective EBMgt teaching on student learning outcomes. It is suggested that our EBMgt teaching approach can be applicable to graduate students not only in healthcare management but also in other fields such as business administration, management, and allied health (e.g. nursing, physical therapy, occupational therapy, speech language pathology, and public health).

Introduction

Healthcare is a fast-changing field that presents many challenges to healthcare leaders and administrators in the United States (U.S.) healthcare system and healthcare organizations. According to the Centers for Medicare and Medicaid Services (2024), the U.S. healthcare system spent $4.5 trillion on national health expenditures in 2022, which accounted for 17.3% of our Gross Domestic Product (GDP). A study conducted by Shrank et al. (2019) indicated that approximately 25% of total health care spending in the U.S. healthcare system was wasteful despite efforts to reduce overtreatment, improve care, and address overpayment.

There is a sense of urgency to reduce high health costs and waste and to improve the quality of management decision-making in the current U.S. healthcare environment. Scholars identified that an evidence-based practice model would enhance the competence of the decision makers and leverage their motivation to use more scientific methods in healthcare management decision-making (Kovner & Rundall, 2006; Pfeffer & Sutton, 2006).

Association between Evidence-Based Management and Evidence-Based Medicine

The concept of EBMgt is originally derived from evidence-based medicine (EBM). EBM started in the early 1990s. It was developed by two prominent physicians, Dr. Archie Cochrane and Dr. David Lawrence Sackett. There are a few definitions about EBM. The popular one is Dr. Sackett's definition: "Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values" (Sackett et al., 2000, p. 1). This definition clearly indicates that EBM is comprised of three components: best scientific research evidence, clinical expertise, and patient concerns and values.

Traditionally, the care of patients was influenced by the experiences and opinions of physicians who provided patients with treatment and diagnosis. However, clinical decisions made solely on professional experience were not enough to treat patients efficiently and effectively. Therefore, in the early 1990s, Dr. Archie Cochrane and Dr. David Lawrence Sackett proposed a new approach for physicians practicing medicine. This new approach was named "evidence-based medicine" (EBM). They stated that physicians' clinical decisions on patient care should be made based on the best research evidence, patient values, and professional experience. Since then, more physicians have begun to practice EBM to improve the effectiveness of patient care.

In the late 1990s, EBM was extended beyond medicine to the broader context of healthcare administration and allied health professions. Inspired by the EBM movement, Dr. Runo Axelsson introduced a new approach for healthcare administration and healthcare management and named it "Evidence-based Management" (EBMgt) (Axelsson, 1998). In addition, EBM has influenced prominent scholars in healthcare management in the U.S. These scholars published articles

and strongly advocated the adoption of EBMgt in healthcare management (Kovner et al. 2000; Kovner & Rundall, 2006; Walshe & Rundall, 2001). Shortell et al. (2007) published an article entitled "Improving Patient Care by Linking Evidence-based Medicine and Evidence-based Management" in which they stated that consistent, sustainable improvement in the quality of care received in the U.S. is unlikely to be achieved if EBM and EBMgt are not linked together within effective organizational contexts. Patient safety, quality of care and access, widespread demands for reducing the cost of care, and value-based purchasing require healthcare administrators to use EBMgt and to make the right decisions based on the best available evidence in healthcare organizations.

However, EBMgt was not widely used by healthcare administrators in the U.S. in the early stages of EBMgt movement (Arndt & Bigelow, 2009; Kovner & Rundall, 2006). Physicians, pharmacists, nurses, physical therapists, speech language pathologists and other allied health professionals are generally positive toward the evidence-based practice and they consider it to be a best practice model. On the contrary, healthcare administrators have slowly adopted an EBMgt approach in their professional practice (Arndt & Bigelow, 2009; Shuval et al., 2007; Walshe & Rundall, 2001). The literature revealed that healthcare administrators do not often use management research evidence when making management decisions (Dopson et al., 2013; Kovner & Rundall, 2006). One of the reasons for not adopting EBMgt in their own practice is that healthcare administrators have differing beliefs and attitudes toward the EBMgt practice. Kovner and Rundall (2006) conducted a study that included interviews of 68 U.S. health service managers on their attitudes toward EBMgt. The study results showed that these health service managers and administrators presented a low level of interest toward the use of EBMgt due to a negative belief and attitude toward EBMgt in the early 1990s and 2000s.

Research results showed that some of the contributing factors for the negative belief and attitude toward the use of EBMgt were unfamiliarity with EBMgt, lack of time, lack of training, resistance to change, and lack of evidence (Guo et al., 2018). However, there has been a growing number of healthcare administrators and managers who have positive beliefs and attitudes towards the use of EBMgt in recent years (Guo et al., 2016, 2017a, 2017b). In particular, the Center for Evidence-Based Management (CEBMa) led by Dr. Denise Rousseau and other scholars have done great things to promote EBMgt among scholars, educators, and practitioners to advance the EBMgt movement to the next new level.

According to the CEBMa, EBMgt was defined as making decisions about the management of employees, teams or organizations through the conscientious, explicit and judicious use of four sources of evidence (CEBMa, 2014). The four sources of evidence that are used for practicing EBMgt are scientific research findings, professional wisdom and experience, organizational data and facts, and stakeholder values and concerns. Recently, EBMgt has been further defined as the systematic application of the best available evidence and critical thinking to the evaluation of management strategies for improving organizational performance (CEBMa, 2023). The only

difference between the EBM and EBMgt approaches is that the EBM practice includes individual patient values and concerns for physicians' clinical decisions while the EBMgt practice takes into account the broader context of management practice that includes organizational data and stakeholders' concerns and values for healthcare administrators' decision-making.

Rationale for EBMgt Teaching

A literature review showed that evidence-based management leads to improved quality of care and enhanced healthcare organization performance (Connor et al., 2023; Hedayatipour et al., 2024). Some studies have demonstrated that incorporating evidence-based practice in nursing leads to better patient outcomes and reduced clinical errors and costs (Mazurek et al., 2016; Sonğur et al., 2018). The book titled *Evidence-based Management in Healthcare by* Kovner et al. (2009) provided 10 real-life examples that illustrate how the EBMgt approach is used in a variety of situations from inpatient bed panning to operating room scheduling, to leadership development, and how healthcare leaders and administrators moved from making educated guesses to using the best available information to make informed decisions.

One of the examples provided in the book is that the Yale-New Haven Hospital's leaders and managers incorporated evidence-based analysis and decision-making in the areas of strategic planning, resource allocation, quality and safety surveillance, performance management, and operational dashboard systems designed to provide real-time assessments (D'Aquila, 2009). The EBMgt approach enabled the leaders and managers at the Yale-New Haven Hospital to elevate the performance of their institutions by improving the quality of their decisions.

Another example provided in the book was about a quality improvement initiative to reduce pain in patients requiring long-term care at Village Care of New York (Webb & Flaherty, 2009). Village Care of New York is a complex, community-based, not-for-profit urban healthcare organization that provides leadership and innovative services to two underserved populations-older adults and those infected with HIV/AIDS. The problem this organization had was how to better serve its geriatric and HIV/AIDS patients who were receiving pain management treatment. After conducting literature searches and assessing the search results, the organization found rigorous scientific evidence that applying an evidence-based approach to the pain management initiatives in their multiple programs as well as evidence-based medicine would help them determine necessary changes to the treatment of their patients' chronic pain.

The examples provided in the Kovner et al. (2009) book demonstrated that using an evidence-based decision-making approach could improve the performance of healthcare organizations. In the recent decade, more healthcare leaders and managers have changed their attitudes toward the use of EBMgt (Guo et al., 2016, 2017a). Most health leaders and managers in the U.S. do not have clinical backgrounds, nor receive formal EBMgt training.

However, participants in studies conducted by (Guo et al., 2016; 2017a) considered EBMgt to be a best practice in healthcare administration and management decision-making. Guo et al. (2018) carried out another cross-sectional study that explored what factors interfered with the adoption of EBMgt among 154 U.S. hospital presidents and chief executive officers. The study identified that one of the barriers to the use of EBMgt was lack of training since many currently practicing healthcare administrators and managers did not have an opportunity to learn EBMgt during their university studies. Other barriers perceived by these healthcare leaders were lack of time, lack of training opportunities, unfamiliarity with EBMgt, and lack of skills in searching and appraising the quality of evidence.

Given the fact that EBMgt is a best practice in healthcare management and not many practicing healthcare administrators learned EBMgt in their university studies, it is believed that there is an urgent need for graduate students to learn EBMgt in healthcare management decision-making. Graduate students are the new generation and the future of healthcare. They will play an important role in leading healthcare organizations and making a difference in the future of the U.S. healthcare system. To better prepare them to meet the challenges in health care and make informed management decisions, 25 graduate students were taught EBMgt in the spring of 2022 at Idaho State University's College of Business. The goal was to increase graduate students' EBMgt knowledge, skills, and confidence in practicing EBMgt. It is hoped that with the equipped knowledge and skills in EBMgt, future health leaders and administrators would be able to make better decisions using an evidence-based approach.

The Audience and the Teaching Settings

Three groups of graduate students (25 in total) who were enrolled in the HCA 6615: Health Services Management course in the spring of 2022 at Idaho State University (ISU) received training in the use of EBMgt. These graduate students were pursuing master's degrees in healthcare administration (MHA), Master of Business Administration (MBA) with an emphasis in health care, and doctoral students of osteopathic medicine (D.O.). Idaho State University College of Business has worked together with the Idaho College of Osteopathic Medicine (ICOM) and established a dual program for D.O. students at ICOM who are interested in pursuing an MHA degree at ISU while studying at ICOM to pursue their D.O. degree.

Curriculum Content

The course curriculum taught graduate students the basics of EBMgt. For instance, it taught them the definition of EBMgt, the importance of learning EBMgt, how to use the PICOC model (Problem/Population, Intervention, Comparison, Outcomes, and Context), how to formulate a management question, how to conduct effective searches for scientific evidence,

and the six-step decision-making process. The EBMgt model consists of six steps: framing a management issue or problem into an answerable question; systematically searching for the best available research evidence; critically appraising the evidence (e.g., quality, validity, applicability); weighing and pulling together the evidence; applying the evidence to the decision-making process; and assessing the decision outcomes. In addition, students learned basic types of research methods and the pyramid of evidence in health services research.

To effectively teach EBMgt, the course instructor adopted the second edition of Professor Anthony Kovner's book, *Evidence-Based Management in Healthcare: Principles, Cases, and Perspectives* (2017). Cases were selected from this book and used as examples for students to understand how to apply EBMgt for better decision-making in healthcare organizations.

Following the introduction of EBMgt basics, a health sciences librarian was invited to give a lecture on research literacy skills such as how to develop search strategies, methods of searching for credible information resources through library databases, and how to evaluate the quality of evidence. Graduate students learned Boolean Operators and other effective search strategies for locating the best available research evidence in premier databases such as *PubMed, Business Source Complete,* and other relevant sources.

Teaching Methods

The following teaching methods worked well for our graduate students:

1. At the beginning of the EBMgt instruction, graduate students were assigned to read a chapter from Kovner's book on the importance of decision-making skills and the steps in the decision-making process. In addition, the instructor provided PowerPoint slides and a lecture on EBMgt that introduced the students to EBMgt and identified why it is important to learn it. Before the instruction, most students had never heard of EBMgt. A few students had heard about EBMgt but did not know its content and the six-step decision-making process. After the EBMgt lecture, students had a better understanding of the importance of learning and practicing EBMgt in healthcare management decision-making.
2. Students were also assigned to read the article, *Improving Patient Care by Linking Evidence-Based Medicine and Evidence-Based Management* (Shortell et al., 2007). The article stated that in order to ensure the delivery of high-quality care, knowledge from EBM and EBMgt must be integrated. The article provided examples of the differences between EBM and EBMgt and how they could be successfully integrated. In order to assist students with a better understanding of the EBMgt process and its concepts learned from the article, the instructor asked the students to discuss why integrating EBM with EBMgt would improve quality of patient care and health outcomes. In a discussion post, one student identified that EBM relates to the clinical

side of healthcare practices leading to better care, while EBMgt relates to healthcare organizational strategies, structures, and change management practices and that a disconnect between the two may result in less than adequate results or care provided. The robust discussion that followed demonstrated the students' clear understanding of the relationship between EBM and EBMgt. One student stated, "Learning about evidence-based management in this course has given me additional knowledge to add to my experience with evidence-based practice within medicine (EBM). I plan on using evidence-based management in my future career as a practicing physician and healthcare administrator. I plan on implementing both evidence-based management side-by-side with evidence-based medical practice."

3. To help students develop research literacy skills and a better understanding of effective search strategies, a health sciences librarian provided a lecture which assisted students in identifying what the "evidence" is in evidence-based practice, how to create a research question, how to identify quality research, and how to locate resources. In addition, students were taught how to appraise evidence using the "CRAAP Method" which can be used to identify the currency, relevance, authority, accuracy and purpose of the information. Students were then given a case study and assigned to work in groups to practice applying the PICOC model using a search strategy worksheet (Appendix I). Individual consultation was provided by the health sciences librarian to the students who had questions about developing meaningful search strategies.
4. To enhance student learning outcomes, an assignment was designed to give graduate students an opportunity to do hands-on exercises and apply what they learned from the lectures and readings to real-world cases. Without hands-on exercises and research activities, it may be hard for students to grasp the EBMgt model and understand the values of practicing EBMgt. The assignment required students to do several activities:
    1) Develop a case scenario related to healthcare management and administration;
    2) Formulate a question using the PICOC model;
    3) Conduct literature searches through the employment of search strategies, search terms and sources (e.g., *PubMed, Academic Search Complete,* and *Business Source Complete)*, and evaluate the quality of evidence;
    4) Weigh and pull together the evidence and apply the applicable evidence to the decision by incorporating the best available research and professional experience to their case scenario for better solutions; and
    5) Write an EBMgt practice report that contains a brief summary of the best available evidence found, including five citations published over the past 10 years, and the decision(s) or solution(s) chosen for the scenario.

Due to the limited time for the course, it was impossible for students to complete the final step of the EBMgt model, that is, to implement the decision they chose in healthcare settings and evaluate the results of the chosen decisions/solutions. However, students learned the major components of practicing EBMgt and gained EBMgt knowledge and skills as a result of the instruction provided.

5. After completing the assignment, the students were asked to present their EBMgt practice reports to the class. An example of a student's EBMgt Practice Report is provided (Appendix II).
    1) The case scenario related to healthcare management and administration issues;
    2) One formulated healthcare management question using the PICOC model;
    3) Search strategies, search terms, and sources searched (e.g., *PubMed, Academic Search Complete, and Business Source Complete);*
    4) A brief summary of the best available evidence; and
    5) The recommended decision(s) or solution(s) to the case scenario.

Upon completion of the EBMgt practice assignment, students were graded based on their ability to develop a scenario that provided clearly defined key issues; document search strategies, search terms, and sources; identify five articles relevant to the topic; provide a summary of the evidence found; and recommend solutions to the case issue.

The assignment results revealed that some graduate students did not know how to develop their case scenarios using the PICOC mode. To help them get started with their assignment, a few case scenarios (Appendix III) were created by the course instructor as examples. The course instructor and health sciences librarian provided consultation and guided the students in developing the case or building search strategies. For instance, one student did not have much experience working in healthcare settings and therefore, did not know how to get started with the development of the case scenario. Since burnout of professionals working in healthcare settings is a big issue due to the COVID-19 pandemic and other factors, the instructor suggested it as a topic for the student's case scenario. Then, the course instructor guided the student in developing the case by focusing on physician burnout and the strategies for reducing it using the PICOC model. In the end, the student found sufficient research articles on this topic in *PubMed*, a premier database in medicine and health sciences. In addition, both the course instructor and health sciences librarian guided individual students in the use of Boolean Operators and other search strategies in order to narrow down their search results and find more relevant articles related to their search topics.

A review of the results of the students' EBMgt practice reports indicated that the EBMgt practice assignment was helpful. Instructor lectures provided the students with the basics of EBMgt practice and evidence searches, but the EBMgt assignment provided an opportunity for students to apply what they learned to real-life management issues. The cases students

developed were required to be a problem-based scenario taken from their own observations and experiences in healthcare settings. This motivated the students to look for solutions and make decisions based on the evidence they found in the literature. In addition, this assignment provided students with a hands-on exercise that utilized the PICOC model and followed the EBMgt practice step-by-step. This practice enhanced the student learning outcomes through the real-world cases. Finally, this assignment helped the course instructor identify the students' strengths and weaknesses in practicing EBMgt and what teaching methods and areas the course instructor should change or modify for future improvement. For instance, the instructor found that the students needed to be given more examples to practice on how to develop better search strategies using Boolean Operators. Another finding from the student EBMgt practice reports and presentations showed that the students needed more time to learn different types of research methods that may help them identify the differences and limitations in research designs while evaluating the quality of evidence.

Assessment of EBMgt Student Learning Outcomes

To evaluate the impact of evidence-based management (EBMgt) instruction on student learning outcomes, a pre- and post-assessment survey was administered to a cohort of 25 students through Moodle, the online learning management system managed by ISU. Approval from Idaho State University's Institutional Review Board was obtained to conduct the study.

The pre- and post-assessment survey, designed by the course instructor and an instructional technology consultant, comprised twenty-five Likert questions and six quiz questions (Appendix IV). A paired samples t-test was performed using STATA 17 to evaluate whether there was any difference in graduate students' EBMgt knowledge, skills, and confidence before and after the instruction.

The participants' response rate for this assessment was 100%. The survey results in Table 1 showed a statistically significant difference in students' overall EBMgt knowledge before and after the instruction ($t = -16.80$, $p < 0.001$).

The box plot in Figure 1 provides a visual representation of the data representing the distribution of the before and after results from Table 1. The box in a box plot represents the middle 50% of the data, with the upper and lower quartiles represented by the top and bottom of the box (McGill et al., 1978). For the "Before" learning results, the 25th percentile had a value of 2.0, the 75th percentile had a value of 3.0, and the median value was 2.0. The whiskers extend from the box to the highest and lowest values within 1.5 times the box's interquartile range (IQR), ranging from values of 1.0 to 4.0. The data point outside this range, at a Likert value of 5.0, is considered an outlier. For the "After" learning results, the 25th percentile had a value of 6.0, the 75th percentile had a value of 7.0, and the median Likert value was 7.0. The whisker extends to a value of 5.0.

Table 1. Students' Overall EMBgt Knowledge Before and After the Instruction

	BEFORE		AFTER	
LIKERT ITEM	**N**	**PERCENT**	**N**	**PERCENT**
1 (unfamiliar)	6	24%	0	0%
2	12	48%	0	0%
3	3	12%	0	0%
4	1	4%	0	0%
5	3	12%	5	20%
6	0	0%	7	28%
7 (very familiar)			1	
	0	0%	3	52%
Total	**25**	**100%**	**2**	**100%**

Figure 1. Students' Confidence in Applying EBMgt to Decision-Making

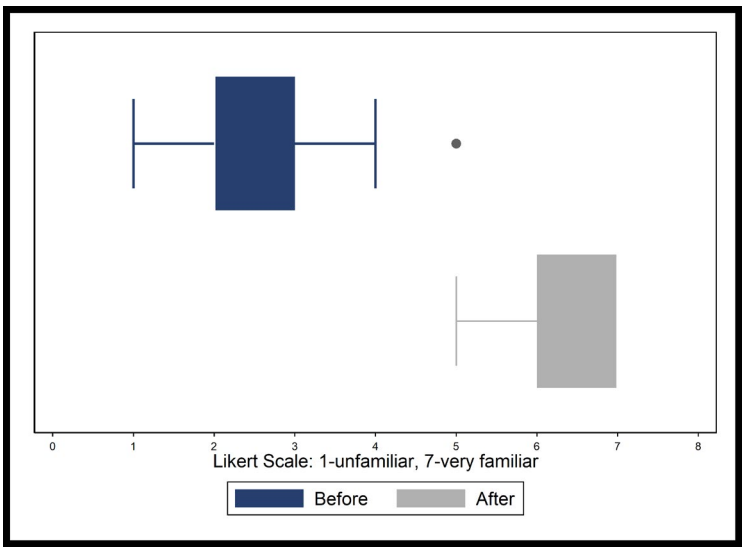


Table 2 indicated a statistically significant difference in students' confidence in applying EBMgt to their decision-making before and after the instruction ($t = -15.83$, $p < 0.001$).

Table 2. Students' Confidence in Applying EBMgt to Decision-Making Before and After the Instruction

	BEFORE		AFTER	
LIKERT ITEM	**N**	**PERCENT**	**N**	**PERCENT**
1 (unfamiliar)	15	60%	1	4%
2	3	12%	0	0%
3	5	20%	0	0%
4	1	4%	1	4%
5	0	0%	9	36%
6	0	0%	6	24%
7 (very familiar)				
	0	0%	8	32%
Total	**24**	**96%**	**2**	**100%**

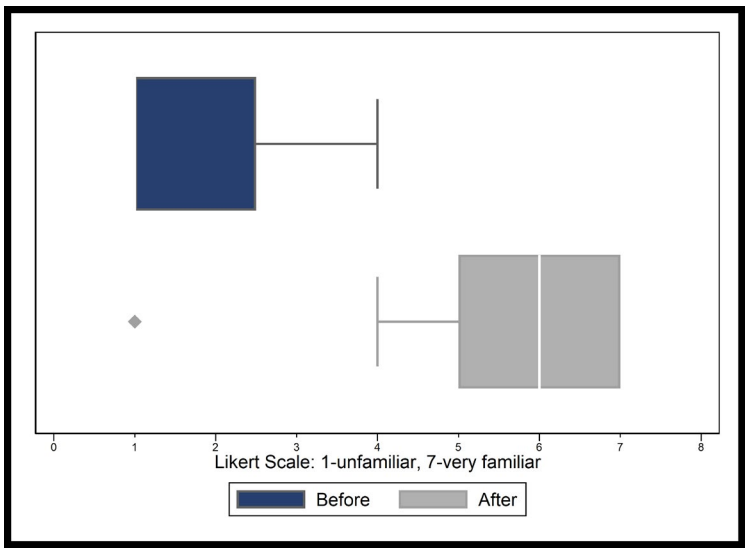
Figure 2 presents a box plot that provides a visual representation of the data representing the distribution of the before and after results from Table 2. For the "Before" learning results, the 25th percentile had a value of 1.0, the 75th percentile had a value of 2.5, and the median value was 1.0. The whisker extends to a value of 4.0. For the "After" learning results, the 25th percentile was at a value of 6.0, the 75th percentile had a value of 7.0, and the median value was 7.0. The whisker extends to a value of 4.0. Additionally, there is a data point outside the range, at a value of 1.0, which is considered an outlier.

The research identified that as a result of the instruction on EBMgt, graduate students increased their EBMgt knowledge, skills, and confidence. One hundred percent (n=25) of participants self-reported that learning EBMgt was very useful for their future healthcare management and leadership decision-making process in healthcare settings.

The final question of the assessment asked students to add any comments about their EBMgt learning experience. One student stated, "I loved learning about EBMgt, I think it will be very beneficial for myself in the future!" Another student wrote, "I'm so glad this was a topic in our course. I had experience with evidence-based medicine, but not evidence-based management. Please keep this in the curriculum so future leaders will follow suit". Another student reported, "I appreciated the extra time that was spent on EBMgt practice and experience. It allowed me to take the time I needed to thoroughly think through a problem, ask questions, research the ques-

tions, and utilize the resources available to me." And finally, "Before this course I had little to no knowledge of EBMgt. I still have much to learn about it and applying it but feel comfortable that I have a great starting point".

Figure 2. Students' Confidence in Applying EBMgt to Decision-Making



Implications for Teaching and Learning

Providing graduate students with instruction on EBMgt practices has some practical implications for academic graduate programs and faculty in healthcare management and leadership. First of all, not many graduate programs in healthcare administration offer EBMgt instruction to graduate students. Our experience in teaching EBMgt indicated that it is feasible for academic programs and faculty to offer EBMgt instruction to graduate students in healthcare administration and other related disciplines. For instance, our instructional methods can be used by faculty in business and management disciplines because the basics of an EBMgt practice approach are the same, including using the PICOC model and the six-step decision making process.

Secondly, through EBMgt instruction and hands-on exercises, graduate students increased their EBMgt knowledge, skills, and confidence in applying EBMgt to decision-making in healthcare settings. Our pre- and post-assessment results demonstrated the impact of effective EBMgt instruction on student learning outcomes.

Thirdly, academic faculty who provide EBMgt instruction usually have knowledge and skills in formulating management questions, critically appraising the quality of evidence, and applying effective research methods. However, it may be helpful to collaborate with academic librarians or information professionals who are experts on information search strategies and database resources.

Finally, graduate students appreciated the opportunity to learn EBMgt as part of their curriculum so that they can be better prepared for making competent managerial decisions using an evidence-based approach in their future healthcare organizations and other business industries.

Conclusions

Our experience with teaching EBMgt suggests that it is applicable for academic programs and faculty to train graduate students in the field of management and administration to utilize EBMgt. Our graduate students in the field of healthcare administration had a positive experience learning EBMgt knowledge and skills and indicated that they felt fortunate to receive the EBMgt instruction before graduation. Students recognized that the knowledge and skills they gained from EBMgt instruction and practice will help to equip them for making better decisions in their future healthcare organizations.

However, there are some challenges in teaching EBMgt that educators need to consider. First, prior to teaching EBMgt to graduate students, the educators may need to check with academic librarians or information professionals to ensure the library provides access to the databases needed for practicing EBMgt with reliable evidence. Second, EBMgt educators may not know how to effectively search evidence using Boolean Operators and other search strategies. It is recommended that EBMgt educators collaborate with academic librarians to teach students how to effectively search for and locate reliable evidence. Third, it takes time for students to grasp the basic EBMgt knowledge and skills. Faculty and graduate schools should realize that one or two lecture sessions without hands-on practice will not be enough for the students to gain the EBMgt skills. Therefore, more time may need to be allocated for providing instruction, one-on-one consultations, and hands-on practice in EBMgt. Finally, students may not be able to locate a higher level of evidence related to healthcare management issues they search for in the literature. The higher level of evidence refers to meta-analysis, systematic reviews, and randomized clinical trials. Therefore, this may require EBMgt educators to encourage students to seek other types of evidence, for instance, case studies, cross-sectional studies, white papers, government publications, organizational data, etc. and incorporate the existing evidence with stakeholder values and professional experience for healthcare management decision-making.

In conclusion, the main goals of teaching EBMgt practices in university health management courses are to equip students with knowledge of the six steps of the EBMgt process and the basic skills in searching for reliable evidence, as well as an opportunity for hands-on practice in the application of EBMgt. Practice makes perfect, and with these newly acquired skills, students will have the knowledge to perfect their ability to practice EBMgt decision-making in their future professions in the healthcare industry.

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References

Arndt, M., & Bigelow, B. (2009). Evidence-based management in health care organizations: A cautionary note response to the commentaries. *Health Care Manage Review*. *34*(3):222–223.

Axelsson, R. (1998). Towards an evidence based health care management. *International Journal of Health Planning and Management, 13*(4), 307-317

Centers for Medicare and Medicaid Services. (2024, January 18). *NHE fact sheet*. https://www.cms.gov/data-research/statistics-trends-and-reports/national-health-expenditure-data/nhe-fact-sheet

Center for Evidence-based Management. (2014). *Definition of evidence-based management*. Retrieved from http://www.cebma.org/a-definition-of-evidence-based-management/

Center for Evidence-based Management. (2023). What Is evidence-based management? https://cebma.org/faq/evidence-based-management/

Connor, L., Dean, J., McNett, M., Tydings, D. M., Shrout, A., Gorsuch, P. F., Hole, A., Moore, L., Brown, R., Melnyk, B. M., & Gallagher, F. L. (2023). Evidence-based practice improves patient outcomes and healthcare system return on investment: Findings from a scoping review. *Worldviews on Evidence-Based Nursing*, *20*(1), 6–15. https://doi.org/10.1111/wvn.12621

D'Aquila, R (2009). Application of evidence-based management at an academic medical center: The Yale-New Haven Hospital Experience. In A. R. Kovner, D., J. Fine & R. D'Aquila (Eds.). *Evidence-based management in healthcare* (pp. 17-27). Health Administration Press.

Guo, R., Hermanson, P. M., & Farnsworth, T. J. (2016). Study on hospital administrators' beliefs and attitudes toward the practice of evidence-based management. *Hospital Topics*. *94* (3-4), 62-66. https://doi.org/10.1080/00185868.2016.1258886

Guo, R., Berkshire, S. D., Fulton, L. V., & Hermanson, P. M. (2017a). Use of evidence-based management in healthcare administration decision-making. *Leadership in health services, 30*(3), 330–342. https://doi.org/10.1108/LHS-07-2016-0033

Guo, R., Berkshire, S. D., Fulton, L.V., & Hermanson, P. M. (2017b). Predicting intention to use evidence-based management among U.S. healthcare administrators: Application of the Theory of Planned Behavior and structural equation modeling. *International Journal of Healthcare Management.* doi:10.1080/20479700.2017.1336856

Guo, R., Berkshire, S. D., Fulton, L. V., & Hermanson, P. M. (2018). Factors affectingb the adoption of evidence-based management among US healthcare administrators. *American Journal of Management*, *18*(1), 36-47.

Hedayatipour, M., Etemadi, S., Hekmat, S. N., & Moosavi, A. (2024). Challenges of using evidence in managerial decision-making of the primary health care system. *BMC Health Services Research*, *24*(1), 1–14. https://doi.org/10.1186/s12913-023-10409-7

Kovner, A. R., Elton, J. J., & Billings, J. (2000). Evidence-based management *Frontiers of Health Services Management*. *16*(4),3–24.

Kovner, A. R., & Rundall, T. G. (2006). Evidence-based management reconsidered. *Frontiers of Health Services Management*. *22*(3), 3–22.

Kovner, A. R., Fine, D., J., & D'Aquila, R. (Eds.). 2009. *Evidence-based management in healthcare*. Health Administration Press.

Kovner, A. R., & D'Aunno, T. A. (Eds.). 2017. *Evidence-based management in healthcare: principles, cases, and perspectives* (2nd ed.). Health Administration Press.

Mazurek Melnyk, B., Gallagher-Ford, L., & Fineout-Overholt, E. (2016). Improving healthcare quality, patient outcomes, and costs with evidence-based practice. *Reflections on Nursing Leadership*, *42*(3), 1–8.

McGill, R., Tukey, J. W., & Larsen, W. A. (1978). Variations of box plots. *The American Statistician*, *32*(1), 12–16.

Pfeffer, J., & Sutton, R. I. (2006). Evidence-based management. *Harvard Business Review, 84*(1), 62.

Sackett, D. L., Strauss, S. E., Richardson, W. S., Rosenberg, W., & Hayes, R. B. (2000). *Evidence-based medicine: how to practice and teach EBM* (2nd ed.). Edinburgh: Churchill Livingstone.

Shortell, S. M., Rundall, T. G., & Hsu, J. (2007). Improving patient care by linking evidence-based medicine and evidence-based management. *JAMA*, *298*(6), 673–676. https://doi.org/10.1001/jama.298.6.673

Shrank, W. H., Rogstad, T. L., & Parekh, N. (2019). Waste in the US health care system: Estimated costs and potential for savings. *JAMA*, *322*(15), 1501–1509. https://doi.org/10.1001/jama.2019.13978

Shuval, K., Shachak, A., Linn, S., Brezis, M., Feder-Bubis, P., & Reis, S. (2007). The impact of an evidence-based medicine educational intervention on primary care physicians: A qualitative study. *Journal of General Internal Medicine*, *22*(3):327–331.

Sonğur, C., Özer, Ö., Gün, Ç., & Top, M. (2018). Patient safety culture, evidence-Based practice and performance in nursing. *Systemic Practice & Action Research*, *31*(4), 359–374. https://doi.org/10.1007/s11213-017-9430-y

Walshe, K., & Rundall, T. G. (2001). Evidence-based management: From theory to practice in health care. *The Milbank Quarterly*, *79*(3):429–457.

Webb, A., & Flaherty, E. (2009). Improving pain management in long-term care: The Yale-New Haven Hospital Experience. In A. R. Kovner, D., J. Fine & R. D'Aquila (Eds.). *Evidence-based management in healthcare* (pp. 161-169). Health Administration Press.

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Appendix 1. Search Strategy Worksheet

PICOC Worksheet and Procedures to Initiate Search

1. **Define your management question using PICOC Model:**

   Problem/Population: _____

   Intervention: _____

   Comparison: _____

   Outcome: _____

   Context: _____

2. **Formulate your question:** _____

   _____

   _____

   _____

3. **Select your search terms:** _____

   _____

   _____

4. **Identify databases/sources and conduct searches:** _____

   _____

   _____

5. **Determine the quality of evidence what was found (Summary):** _____

   _____

   _____

   _____

   _____

Appendix II. Example of the Evidence-Based Management Practice Report

Graduate Student

HCA 6615: Health Services Management

Idaho State University

Evidence-Based Management Practice Report

Case Scenario

Individuals living in rural areas have limited access and resources to healthcare. Many people that reside in rural areas can live up to hours away from the nearest healthcare facility. The long commute can result in delayed care along with preventing rural community members seeking care due to the travel distance and accessibility of care, leading to health problems that could have potentially been avoided. A rural healthcare facility has decided to implement telehealth to improve healthcare access and resources for its rural community members.

My Question

Is telehealth an effective tool for rural healthcare facilities to use to improve healthcare access for its community members?

PICOC Model

Problem: Rural areas and rural community members have limited access to healthcare resources resulting in delayed care or prevents them from seeking care.

Intervention: Implementing telehealth at rural hospitals/healthcare facilities.

Comparison: Not Applicable

Outcome: Easier access to healthcare for people living in rural areas.

Context: Hospital or Healthcare Facility

Search Strategies

Terms: The search terms used included: “rural telehealth ", “rural” and “telehealth”, “rural telehealth or remote telehealth”, rural telehealth effectiveness, and “telehealth effectiveness”. The search terms “rural” and “telehealth” yielded the best results. I narrowed the search settings

to include scholarly journals, articles published within the last 10 years, (2012-2022), and United States was selected for geography.

Databases Used: ISU OneSearch (EBSCO Publishing) and PubMed

Summary of Evidence

1. Butzner, M., & Cuffee, Y. (2021). Telehealth Interventions and Outcomes Across Rural Communities in the United States: Narrative Review. *Journal of Medical Internet Research*, *23*(8), e29575. https://doi-org.libpublic3.library.isu.edu/10.2196/29575

This article discussed the challenges that people living in rural communities' face and how the use of telehealth in rural areas can help eliminate them. Studies were done on using telehealth in rural areas and the effect it has. The studies showed that using telehealth effective but had some disadvantages. "Overall, the included studies reported positive outcomes and experiences of telehealth use in rural populations, including acceptability and increased satisfaction; in addition, the technology was considered convenient and efficient. Other notable benefits included decreased direct and indirect costs to the patient (travel cost and time) and improved access to care". "Disadvantages of telehealth interventions included having tele-visits with unknown providers and technological issues such as loss of connectivity and limited Wi-Fi access in rural areas" (Butzner & Cuffee, 2021).

2. Hirko, K. A., Kerver, J. M., Ford, S., Szafranski, C., Beckett, J., Kitchen, C., & Wendling, A. L. (2020). Telehealth in response to the COVID-19 pandemic: Implications for rural health disparities. *Journal of the American Medical Informatics Association: JAMIA*, *27*(11), 1816–1818. https://doi-org.libpublic3.library.isu.edu/10.1093/jamia/ocaa156

In this article it discusses how the implementation of telehealth programs in response to COVID-19 has significant potential to be a long-term fix for health disparities seen in rural areas. Although there are many benefits of telehealth there are issues that need to be addressed such as broadband access in rural areas that could limit the effectiveness of telehealth and having a proper implementation strategy in place. “Given the substantial investment in infrastructure and training, rural health systems should also consider a comprehensive strategy to ensure sustainability of telehealth programs following the COVID-19 pandemic, which needs to include lobbying for continuing third-party reimbursement for these services.” (Hirko et al., 2020, p. 1818).

3. Nelson, Roxanne. (2017). Telemedicine and Telehealth: The Potential to Improve Rural Access to Care. AJN, American Journal of Nursing, 117, 17-18. https://doi.org/10.1097/01.NAJ.0000520244.60138.1c

Telehealth can help fix the challenges that people living in rural areas face such as socioeconomic factors, geographic circumstances, and workforce shortages. “Telemedicine and telehealth services, however, which have long been considered valuable to improving health care access, have the potential to address these issues and to reduce some of the disparities between rural and urban health care”. Telehealth has potential to improve access but faces implementation barriers that must be addressed before it can reach its full potential. (Nelson, 2017, pp. 17-18)

4. Marcin, J., Shaikh, U. & Steinhorn, R. Addressing health disparities in rural communities using telehealth. *Pediatr Res* **79,** 169–176 (2016). https://doi-org.libpublic3.library.isu.edu/10.1038/pr.2015.192

This article talked about health disparities in rural communities, especially pediatric services, and how using telehealth can be an effective method to providing healthcare access to

specialists for those living in rural locations. Though the article emphasized on pediatric care, it relates to all healthcare services that rural community members have limited access to. “As the technologies continue to evolve, telemedicine has the potential to address pediatric specialists’ geographic misdistribution, and the associated disparities in the access to care for children in underserved communities.” (Marcin & Steinhorn, 2016,).

5. Bagchi, A. D. (2019). Expansion of Telehealth Across the Rural–Urban Continuum. *State & Local Government Review*, *51*(4), 250–258. https://doi-org.libpublic3.library.isu.edu/10.1177/0160323X20929053

Like the other articles, this one discussed how telehealth can be an effective resource for rural communities, but there are challenges when it comes to implementation. “Telehealth has the potential to transform health service delivery in rural and underserved urban communities in ways that could help to reduce health disparities but barriers to widespread implementation remain” (Bagchi, 2019, p. 259).

Decision/Solution

After conducting research, there is evidence to support that implementing telehealth in rural healthcare facilities improves healthcare access and provides other indirect and direct benefits to its community members. It has the potential to reduce most health disparities seen in rural areas that makes getting appropriate healthcare difficult. Using telehealth can eliminate travelling restraints and it gives people direct access to healthcare without having to leave their homes. It also provides rural community members access to more healthcare options than what their rural hospital may have to offer, such as specialists. Telehealth can ease access for those living in rural areas, but there are also challenges for implementing telehealth for rural healthcare

facilities and individuals that live in remote areas. Many people that live in rural areas have limited or no access to broadband which is needed for telehealth. Implementing telehealth is not an easy task as there are many tasks that must be faced along with proper strategies in place for telehealth to be efficient. I would recommend implementing telehealth at the rural healthcare facility but suggest more research is done before implementation to ensure a proper strategic plan is in place to ensure efficiency and to eliminate barriers if possible.

Appendix III. Evidence-Based Management Practice Case Scenarios

Ruiling Guo

Idaho State University

Case Scenario 1: Patient Engagement

As a health manager in a medical group practice, you have noticed that patients want to be connected and engaged in their healthcare decision-making process. You understand that a patient's greater engagement in health care contributes to improved health outcomes and patient satisfaction.

With value-based care, you would like to discover new innovations and approaches in patient engagement that will work within value-based payment models and your patient populations. You decide to conduct searches and try to identify some research evidence about patient engagement for value-based care. You hope the research findings about new innovations and approaches to patient engagement will help you develop new strategies to improve patient satisfaction and may even lead to better outcomes in your facility.

Case Scenario 2: Dyad Leadership Model

As a health care administrator in an acute care hospital, every day, you are facing challenges in leading your organization to provide quality of care for a lower cost. You have heard about the Dyad leadership model. You wonder if you can apply the Dyad leadership model to your organization to make effective changes in the quality of care and better health outcomes.

However, you do not know much about Dyad leadership. You want to locate research articles about Dyad leadership models and analyze the advantages and disadvantages of implementing the Dyad leadership model in health care organizations and how it

improves the effectiveness of organizational performance. You may want to adopt this model in your acute care hospital to improve the quality of care and better health outcomes.

Case Scenario 3: Transforming the Delivery of Primary Care

According to the Agency for Healthcare Research and Quality, the primary care medical home, also referred to as the patient-centered medical home (PCMH), is a promising model for transforming the organization and delivery of primary care, and improving the quality, safety, efficiency, and effectiveness of U.S. health care. This model encompasses five functions: comprehensive care, patient-centered, coordinated care, accessible services, and quality and safety.

As a health care manager, you have an interest in the PCMH model. You would like to begin to search for the evidence about this model to answer your questions, for instance, what is PCMH model? How does it work? Is there any sound evidence that this model of care helps achieve the Triple Aim of improved population health, improved patient experience, and reduced health cost?

Case Scenario 4: Community Health Needs Assessment

You are a CEO of a community health center in Southeast Idaho. You want to develop a new health service/educational program to improve the health of populations in your community. To help you make an informed decision on what services/programs your health center would provide, you need to form a research committee to conduct a community health needs assessment.

The purpose of this assessment is to identify how healthy your community is, what the prevalence, incidence, and mortality rate of diseases, such as diabetes, stroke, and heart disease, and how the factors such as health behaviors, clinical care, social and economic environment, and physical environment affect the health outcomes in your

community. You may search for evidence, analyze the data and facts you collect from your research, and then make recommendations on what health services/programs you would provide to improve the health of the population in your community.

Appendix IV. Evidence-Based Management Assessment Survey

Part I. Self-evaluation

Please rate yourself on each of the following items. A 7 point scale is used for the following items with 1 representing the lowest point and 7 representing the highest point of the scale. After the first two items, note that 3 sequential items concern the same subject matter. For example, item C asks you to rate the knowledge, item D asks you to rate your use and item E asks you to rate your confidence.

A. I am familiar with evidence-based management (EBMgt) practice.

1 2 3 4 5 6 7 NA
(unfamiliar) (very familiar) (not applicable)

B. I rate the benefits of practicing evidence-based management (EBMgt) as:

1 2 3 4 5 6 7 NA
(no benefit) (very beneficial) (not applicable)

C. I rate my knowledge of the EBMgt principles as:

1 2 3 4 5 6 7 NA
(no knowledge) (sufficient knowledge) (not applicable)

D. I rate my use (frequency) of the EBMgt principles as:

1 2 3 4 5 6 7 NA
(no use) (frequent use) (not applicable)

E. I rate my confidence in applying the EBMgt principles in my decision-making as:

1 2 3 4 5 6 7 NA
(no confidence) (very confident) (not applicable)

F. I rate my knowledge of the EBMgt 6-step process as:

1 2 3 4 5 6 7 NA
(no knowledge) (sufficient knowledge) (not applicable)

G. I rate my use (frequency) of employing the EBMgt 6-step process as:

1 2 3 4 5 6 7 NA
(no use) (frequent use) (not applicable)

H. I rate my confidence in using the EBMgt 6-step process as:

1 2 3 4 5 6 7 NA
(no confidence) (very confident) (not applicable)

I. I rate my knowledge of formulating questions using the PICOC model as:

1 2 3 4 5 6 7 NA
(no knowledge) (sufficient knowledge) not applicable)

J. I rate my use (frequency) of formulating questions using the PICOC model as:

1	2	3	4	5	6	7	NA
(no use)						(frequent use)	(not applicable)

K. I rate my confidence in formulating questions using the PICOC model as:

1	2	3	4	5	6	7	NA
(no confidence)						(very confident)	(not applicable)

L. I rate my knowledge of searching PubMed and other resources for EBMgt as:

1	2	3	4	5	6	7	NA
(no knowledge)						(sufficient knowledge)	not applicable)

M. I rate my use (frequency) of searching PubMed and other resources for EBMgt as:

1	2	3	4	5	6	7	NA
(no use)						(frequent use)	(not applicable)

N. I rate my confidence in searching PubMed and other resources for EBMgt as:

1	2	3	4	5	6	7	NA
(no confidence)						(very confident)	(not applicable)

O. I rate my knowledge in evaluating the quality of evidence as:

1	2	3	4	5	6	7	NA
(no knowledge)						(sufficient knowledge)	not applicable)

P. I rate my use (frequency) of evaluating the quality of evidence as:

1	2	3	4	5	6	7	NA
(no use)						(frequent use)	(not applicable)

Q. I rate my confidence in evaluating the quality of evidence as:

1	2	3	4	5	6	7	NA
(no confidence)						(very confident)	(not applicable)

Part II. Multiple Choices

Circle the one response that you think is the most appropriate answer.

A. What is evidence-based management?

1. Evidence-based management is about using numbers and statistics.
2. Evidence-based management is about giving you an answer to the problem.
3. Evidence-based management is an evidence-based practice in management that uses the current best available scientific evidence.

4. Evidence-based management is an evidence-based practice in management that uses the current best available scientific evidence in conjunction with individual professional expertise, organizational data, and stakeholder values.

B. What is the EBMgt process?

1. Asking a management question
2. Acquiring evidence
3. Evaluating the quality of evidence
4. Applying the evidence to decision-making
5. Assessing the outcomes of the decision taken
6. Publishing an article in a peer-reviewed journal
7. All the above
8. All the above except No. 6

C. Which type of articles show a high level of evidence?

1. Interview study
2. Case study
3. Editorial letter
4. Systematic review/meta-analysis

D. What does PICOC stand for?

1. Problem, Intervention, Comparison, Outlook, Outcome
2. Problem, Intervention, Comparison, Outcome, Context
3. Problem, Interest, Comparison, Outcome
4. Problem, Intervene, Comparison, Outcome

E. I feel comfortable using evidence-based management in my future healthcare management decision-making.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

Any comments on evidence-based management learning experience in this semester

_____

_____

Seven Unexpected Questions to Help Build Evidence-Based Leadership Development Programs

Hannes Leroy, Moran Anisman-Razin,
Pisitta Vongswasdi, Johannes Claeys

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Seven Unexpected Questions to Help Build Evidence-Based Leadership Development Programs

Hannes Leroy, Moran Anisman-Razin
Pisitta Vongswasdi, Johannes Claeys

A favorite metaphor for the leadership development (LD) industry is the Wild West (Beer et al., 2016; Leroy et al., 2022). Snake oil can be sold as the most effective cure and no sheriff in town oversees what is effective, useless, or blatantly harmful. As scholars in evidence-based LD, this both bleeds our heart and intrigues us: How can this industry exist and thrive, with billions of dollars spent yearly (Mercer, 2019; Narayandas & Moldoveanu, 2019) without objectively demonstrating how it makes a difference? Fascinating – no? Over the years our skepticism has been replaced with an unquenchable thirst to unveil the mystery of the LD industry. We doubt that there ever will be a sheriff in town – and in fact we do not believe that academics should be policing the LD industry. Instead, in our role of knowledge generators and educators – our focus here is on highlighting what we have learned from a decade of attempting evidence-based LD – with the intent of inspiring and supporting.

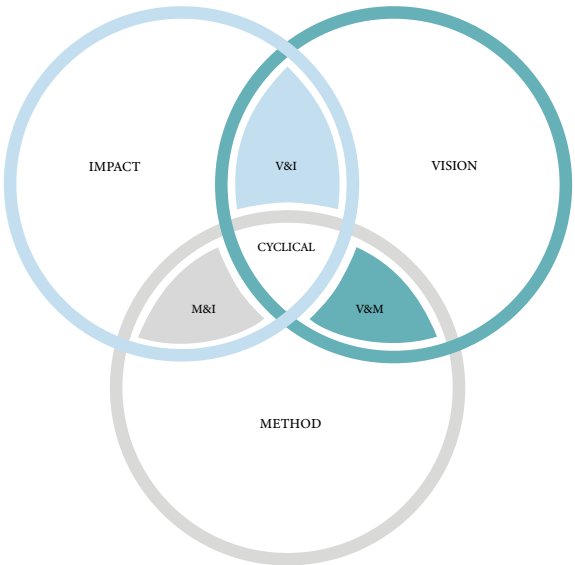
We have made three "discoveries" over the years: (1) many academics have an evidence-based identity, that is, most of us agree evidence should be used to guide practice (see also Rousseau & McCarthy, 2007); (2) many academics spend a significant portion of their time teaching; and (3) many academics are not pedagogically certified nor spend time learning and applying educational evidence to their teaching. In effect, we don't walk our own evidence-based talk when it comes to our teaching (Leroy et al., 2022). Many were also never trained to do so. With the academic priority of producing our own research, we tend to overlook opportunities to design our teaching in accordance to evidence on learning and development. This

chapter addresses that challenge by offering questions we can ask to improve our evidence-based teaching capacity (specifically in leadership development).

Evidence-based thinking is important in all areas of education, but we would argue that it is especially important for LD. Why? LD seems to be shrouded in mystery – with vague terms and metaphors being used to describe the "magic" of development rather than precise theorizing (Leroy et al., 2023a). Consider the difference between training and development. Training suggests a clear incremental model of working towards concrete competencies and takes a targeted short-term perspective. In contrast, development is more ambiguous, often experiential, and individualized or idiosyncratic – more challenging and taking much longer to fully realize (Day et al., 2014; 2021). LD also comes with strong beliefs about certain types of leadership or development that are ideologically grounded (Vongswasdi et al., 2023a) and assumed to be true rather than carefully construed (Leroy et al., 2022). Finally, notwithstanding its recent exponential growth, the LD knowledge base is less developed than the broader field of leadership (Day & Zaccaro, 2004; Leroy et al., 2022; Wallace et al., 2021). In effect, LD has less evidence to draw from.

A lack of clear evidence as a guidepost does not preclude evidence-based thinking (Rousseau & Gunia, 2016). This chapter seeks to help make your LD efforts more evidence-based. Table 1 offers seven questions that academics, leadership developers/educators, hiring companies, and accreditation institutes could ask to better develop evidence-based thinking. These seven questions highlight the core components of LD programs, that is, Vision, Method, Impact, depicted as three mutually reinforcing pillars for evidence-based LD design, implementation and evaluation (see Figure 1; also in Leroy et al., 2023).

Figure 1. Three Components of Leadership Development Programs



Vision focuses on the "What" – a statement of what the program aims to develop in participants. This statement relies on broader, consistent and precise vision regarding what effective leadership means. *Method* focuses on the "How" – the plan or design outlining how the participants will develop throughout the program (i.e., the program's pedagogy and curriculum). Finally, Impact addresses the "Why", that is the expected outcomes of the program for the individual and the justification(s) for undertaking the program.

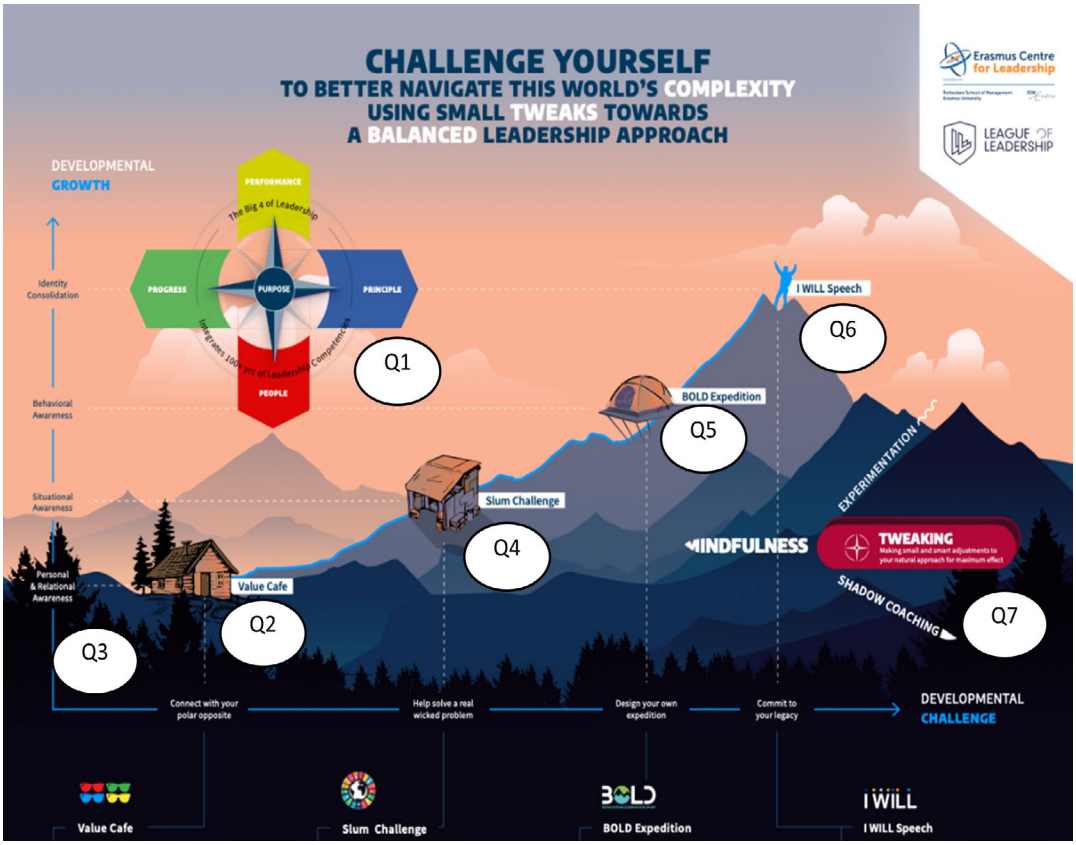
To trigger the reader's attention and critical mindset, our focus here is on the questions that people typically DON'T ask. Our questions are also unusual in that they do not focus on the main three components in Figure 1 (Vision, Method, Impact) but more so on what is excluded from them and what characterizes the overlapping areas between them. These questions can help us shed light on areas that do not often receive attention in program design and can therefore undermine the success of the program by creating misalignment between components, failing to consider certain outcomes, or missing opportunities to enhance leaders' development more holistically. In response to each question, we highlight how it surfaces typical challenges in program design and offer guidance to increase the effectiveness of leadership development programs. We call this the integrity-based thinking for LD – with integrity referring to how the different components of an LD program align and integrate into a coherent whole. We found that this alignment drives program effectiveness and describe this in more detail elsewhere (Leroy et al., 2022; 2023b).

We try to exemplify these questions by describing how they have helped the design of our own programs. We created the infographic below to visually capture the blueprint for our programs and its key principles. Throughout this chapter we use it to demonstrate each question, aligning it with one short example. This infographic shows one of the many ways institutes, business schools, and universities around the world aspire to be evidence-based in LD.

Table 1. Questions to Ask About Leadership Development Programs

COMPONENT	GUIDING QUESTION
1. Vision (V)	What type of leadership does the program NOT develop?
2. Method (M)	How do people develop OUTSIDE of the program?
3. Impact (I)	What are possible BYPRODUCTS of the program?
4. V&I	How do people COME IN and WALK OUT?
5. V&M	What UNIQUE TOOLS have been developed?
6. M&I	What desired outcomes are BUILD INTO the program?
7. Cyclical	Are there STORIES of learning from FAILURE?

Figure 2. The RSM Leadership Development Framework



Q1 – Vision: What do you NOT want to develop?

Programs worldwide tout 'effective leadership' as their product. However, what 'effective' is, can be widely different across contexts. Take for instance the topic of power and politics – while some schools and companies would ban these words, others embrace it in their curriculum. Jeffrey Pfeffer of Stanford University for instance emphasizes the importance of power and politics in the workplace (Pfeffer, 2010), whereas others decidedly challenge the instrumentality of business education to focus instead on the humanization of leadership (Petrigilieri & Petrigilieri, 2015). Other programs don't choose, but include every leadership buzzword – claiming two quite opposing perspectives on leadership like empowerment and management control systems within one program. Considering this, a good first question is: ***What is your vision around effective leadership? More specifically, what type of leadership does the program NOT develop?***

To better understand the array of approaches to leadership, we embarked on a research journey that maps existing leadership approaches – we found no less than 113 established leadership styles (i.e., found to be linked to some metric of effectiveness; Inceoglu et al.,

2023). Applying Schwartz's (1999) values framework to make sense of this plurality helped us organizing these many styles in a coherent manner. This led us to define the 'Four Ps' (i.e., Performance, People, Progress and Principles) of leadership (these can be seen on the top left side of Figure 2, shaped like a compass). To stimulate your thinking, we link these leadership approaches to the four colors of the main European Union political parties corresponding with their underlying values (i.e., blue for the conservative, red for socialist, green for the environmentalist, and yellow for liberal). For example, styles that are characterized as delegative-participative fall under the value of progress, depicted as green in Figure 1. This framework highlights the diversity of thought in leadership: values are the basis of personal, political, religious, cultural, and belief systems with some values being quite oppositional.

Although adopting opposing values may be rare, evidence suggests it not only possible but necessary to combine seemingly opposing perspectives, since integration may be necessary to tackle the world's most complex problems. Such view characterizes research on leadership hybridity (Zhu & Hewett, 2022), leadership paradox (Zhang et al., 2015), and integrative complexity (Vongswasdi et al., 2023c). In our programs we have long debated this question – do we only advocate one perspective or, should we take a more complex integrative view of effective leadership? After much deliberation, we concluded that it is the latter that characterizes our approach – leadership that integrates by navigating the plurality of perspectives. Does this mean we ended up trying to incorporate "everything" (i.e., the thing we advised against from the start)? Absolutely not – we consciously stayed away from a simplistic and singular perspective of leadership, and if there is one core competency we seek to develop in our participants, that would be to enhance their ability to consider organizational and societal problems through the lens of multiple values (i.e., the multiple perspectives presented above).

Q2 – Method: How do people develop OUTSIDE of the program?

Method means that a program has a clear developmental journey – a stepwise process of how people evolve through it. However, we must recognize that the adults in our classrooms are the product of behavioral influence (e.g., parents, teachers, friends, bosses, coworkers) before and after they enter the classroom. Even with the best exercises intended to accelerate development, it will be very hard for people to experience and sustain fundamental change in the limited time we have them in the classroom. As such, increasing evidence (Dragoni et al., 2014; Hammond et al., 2017) suggests that development happens outside of the classroom, therefore, effective LD programs (LDPs) have a deliberate strategy for enabling people to develop beyond the classroom. It is thus crucial that we ask ourselves as we design our programs: ***How do people develop outside of the program?***

Our infographic shows a clear developmental journey in the form of climbing the developmental mountain. This journey includes the formal components of the program, as well additional actions participants plan and take outside the program itself, either during it (when

the program is a longer one) and after its completion, as oftentimes real development begins after the program ends. Climbing that mountain however does not only happen within the confines of the classroom. In fact, various key elements on the developmental journey are experiential and fall outside of the scope of a traditional, classroom-based educational program.

Often, we hear from participants of LDPs that the thing that contributed the most to their learning is the people, the connections, and their conversations (often outside formal sessions). The most valued aspect of the experience is often the opportunity to learn from diverse perspectives. This notion initially tested our preconceptions—were we to simply put diverse individuals in a room together and expect transformative outcomes? However, as we ran multiple iterations of the program, the underlying principle became evident – engaging with people of different worldviews contributes to leader development. Recognizing this, we decided to incorporate these elements into our program design and developed the Value Café exercise, which aims to bring out the diversity of participants through active exchanges (Vongswasdi et al., 2023c). The exercise uses provocative statements which we know that will lead to value disagreement – take for example "Your colleagues should be your friends" or "Money doesn't make you happy." As you can imagine, we typically have a polarization of opinions within the group (oftentimes 50/50 split in the team members' agreement with these statements). That is a perfect starting point to facilitate meaningful conversations in dyads – where we couple people with their opposite to discuss their positions on these statements (this is why we also call this the Arch-Enemy exercise). Through these discussions, participants have an opportunity to listen to views opposite to their own and consider the needs of – and challenges involved in leading people with different values, but also the benefits and importance of having such conversations.

Q3 – Impact: What are potential (BY)PRODUCTS of the program(s)?

What do you hope to achieve with this LD program? Better leaders? This seems like an obvious answer, but in our work, we find that companies do leadership development for a variety of reasons, and some of them seem to have little to do with developing leaders (Vongswasdi et al., 2023a). Retention management, satisfaction with HRM, moral and humanistic reasons, tax deductible bonuses, strategic reorientation, … LDPs have many (intended) consequences and sometimes – unintended ones. Some trainings (e.g., mindfulness, coaching) have been shown to increase turnover – as the training made participants realize the company was not the right fit for them (Nicholson & Carroll, 2013). Interestingly, some companies also admit this is why they send certain individuals to LDPs – because it saved them from having to fire them (better they realize it on their own!). The moral of this story is not to be shocked that this happens, but to become better aware of what your program does (not) seek to achieve. Therefore, the third question developers should ask themselves is: ***What are potential (intended and unintended) outcomes of the program(s)?***

Our own focus is on development and not on generating satisfaction scores or smile sheets (which is still the predominant way of evaluating LDPs; Kaiser & Curphy, 2013). We disagree with the premise that programs should be focused on satisfaction – if participants do not 'sweat' a bit during development we might be doing something wrong. And while typically our satisfaction scores are not low (especially with some time lag between training and evaluation – when real-world effect has kicked in), we have come to expect that about 5% of the cohort will not appreciate these programs (i.e., will score low on satisfaction) and that is perfectly fine as long as the other 95% develops in a meaningful way. Positive emotions during training almost always guarantee high scores on smile sheets (which is why some trainers – ourselves included at the start of our career – focus on feel-good exercises). However, negative emotions can accelerate actual behavioral change if conditions of mindfulness are met (Vongswasdi et al., 2023b). This is visible in the axes of the infographic – where developmental growth is a function of negative emotions. Throughout the program we increase the potential discomfort – with each exercise putting participants more and more outside their comfort zone. These challenging experiences can affect participants' immediate satisfaction (a temporary byproduct), however, we accept this trade-off in pursuit of our primary objective: to foster profound learning and behavioral transformation.

Q4 – Vision & Method: Which unique EDUCATIONAL TOOLS match your vision?

Having customized tools is a hallmark of craftmanship. Imagine a woodworker who has developed a unique tool for their signature finish. When considering LDPs, we propose that customized tools signify that one's developmental vision is not just 'on paper' but that the program is specifically designed to bring about their own unique vision in a way that aligns with their approach to development. If you can give leaders a tool that that they can use in their daily work life in an easy and convenient way, there is a higher likelihood that they will implement it, and that it would have a long-lasting impact on their leadership. Therefore, we encourage developers to consider their vision and the way they embed it within their programs and ask themselves: ***Which unique educational tools match your vision?***

One of the examples of a unique tool in our programs is the wilderness expedition. The expedition runs for the whole program, regardless of participants' preference for and liking of the outdoors. If you are now thinking that is a nightmare for our teaching evaluations, you're wrong. People walk out of this exercise fulfilled. These expeditions are designed in such a way that they create a unique context for individuals, one in which they disconnect and put distance between themselves and their everyday work. In a way these expeditions are a manifestation of a basic thing humans have been doing for centuries – going on vision quests, retreats, and sabbaticals. Such journeys (and the disconnection they provide) have been instrumental in people's self-quests in which they have traditionally explored and reflected on their identities.

That distance allows individuals to deconstruct, reconstruct, and fully embrace their evolving identities in a liminal space (Ibarra, 1999). Convinced by this necessity, we take participants on a journey to examine and understand themselves, letting them experiment and develop their sense of self in different ways.

Q5 – Vision and Impact: How do people COME IN and how do they WALK OUT?

One of the core recommendations to enhance the effectiveness of a program is to conduct a needs-analysis (i.e., identifying the competencies most in need of development) and to be clear about what developmental goals you are working towards (Lacerenza et al., 2017). Often these focus on the knowledge, skills, and abilities (KSAs) that people enter with and exit with, ideally charting a developmental journey that links the beginning to the end. Yet equally important is the motivational journey that participants go through. Thus, in planning LDPs, we need to ask ourselves about the difference that the program will make for participants and the way it will do that: ***How do people come in and how do they walk out?***

Consider this paradox: Often the people who need the training the most (i.e., low in required KSAs) are the ones who are least motivated to stick to the program, perhaps related to the fact that they need to exert the highest effort to improve their scores. For example, one study (Sheldon et al., 2014) found that managers with the lowest emotional intelligence (EI) skills often rated their own EI abilities highly, and when given objective feedback, these individuals were less likely to recognize the feedback's validity, showing little interest in improving their EI. Conversely, managers with stronger EI scores were more open to enhancing their EI skills further. In LDPs we often cater to the latter group, or what we'd like to call the 'believers' – people who are already bought in, thus ignoring those who need the development the most. Yet, by considering both groups – where they start and where they get to because of the program is key not only for assessment of programs, but also for their design, as different starting points may lead to different journeys throughout the program. A well-designed program would address such different needs and trajectories.

A key concept to assist us in answering and addressing this question is developmental readiness (Avolio & Hannah, 2008) – assessing whether leaders and the surrounding context (such as the key stakeholders or the culture in the organization) are ready for the intended change (Hannah & Avolio, 2010). Developmental readiness is often a qualifier – a program doesn't work if people aren't ready. We would argue that getting people ready – and addressing their unique starting points – should be part of the program and that evidence-based programs are able to demonstrate the development that participants undergo throughout it. One such example is the Slum Challenge in Figure 1, which gives us an opportunity to examine the change participants go through in the program and the difference in their leadership between how they came in and how they leave. Here we developed an exercise that is specifically designed

to measure participants' ability to consider multiple, opposing perspectives simultaneously. In a full day intense case challenge, participants are given a seemingly impossible challenge – as in many cases in the real world, all values can never be fully satisfied, thus participants need to find ways to balance them out. This development center is intimately tied into the vision and impact of the program. Specifically, it focuses on participants' application of the Big X model through a 24-hour challenging experience. The exercise offers participants a unique development opportunity, where they can implement the lessons learned throughout the program, providing them with detailed feedback (by coaches) on their performance and how to develop and improve as leaders. The true test of program effectiveness is repeating a similar challenge and seeing to what extent participants have improved.

Q6 – Method and Impact: Which outcomes could be BUILD INTO the program?

A good program has a clear idea of the outcomes that it wants to achieve. However, considering that development often takes a long time to materialize (if it materializes at all), those who invest in LDPs may have little to show for their investment. Therefore, ***building concrete outcomes into the program*** aligns the program's method with the desired impact and helps to keep it on target and action-oriented. For instance, if you want people to develop their entrepreneurial leadership, then ensure that they work on entrepreneurial projects. Or if inclusive leadership is part of your vision of effective leadership, make sure that the person walks away with at least four new relationships that will enhance their diverse network ties (Khattab et al., 2020). Knowing what you are targeting with the program, allows you to design it in such a way that some of the desired outcomes materialize during the program. That is not just good return-on-investment, but through cycles of feedback and improvement, one can expect greater learning and increased self-efficacy, thus leading to a higher likelihood that people will continue to implement their learning in the future.

An example of build-in outcomes in our programs is the I WILL statements. In this module, we ask people to make public commitments to their development goals or – more generally – their career goals, stating what they will do to be a force for positive change in the world. The I WILL statements provide an in-program outcome for participants. By setting a vision and intention publicly within the program, participants make themselves accountable and can apply their learnings from the program to an actual (new) project to experiment with and learn through. The I WILL statement also aligns with the core of our model and the fifth P – "Purpose." In our model, leaders need to balance out Performance, People, Principle, and Progress, but they do not act solely based upon concrete goals, convenience or political skills, they do so because they are driven by a clear Purpose. The I WILL statement is not only used because of the envisioned "accountability", but above all else determined by "responsibility" in the etymological sense of the word (i.e., *responsus* or to respond). It is a specific, tangible

but consistent answer – their response – to a deeper calling. If we assume that behavior is fundamentally driven by individuals' salient identities, then leadership development should be intimately connected with "identity work" (Brown, 2015; Ibarra, 1999; Ibarra & Barbulescu, 2010). As such I WILL statements provide an in-program outcome, which will impact the participant well beyond the program, but can firstly be examined and assessed during the program itself.

Q7 – Cyclical: Does the program have stories of how they learned from FAILURE?

LD is a never-ending quest for improvement. The search for integration between vision, method, and impact means continuous tweaking over time to get it exactly right. Indeed, you can have the perfect design that is aligned with your method, but participants are just not getting the desired results. Simple and little tweaks like changing the order of elements, talking through the motivation to develop first, or changing the time of year that the program takes place, all can have a substantial impact on whether the program is successful. In our time as developers, we have never had a program that runs perfect from the beginning (nor from the tenth time), every iteration requires tweaks to improve but also to adjust to the audience you have in front of you. A key way to make these necessary tweaks is to learn from failure and implement the lessons learned into the next iterations of the program, therefore, developers should ask themselves – ***what can we learn from our stories of failure, and how can we adapt and tweak our program based on these learnings?***

One of the most important "tweaks" that we implemented was to our coaching method. We used to have executive coaches in our program that were excellent at their job but were disconnected from the content of the program. These were executive coaches in the true sense of the word: intended to help participants reflect and work through their own challenges, in a non-normative way. However, the programs clearly have normative developmental goals (as discussed until now), and we are held accountable to those developmental goals whether by accreditation bodies or the companies that expect them to be achieved. Our coaches now know the program and model throughout, so when they speak to participants, they can refer to it and help participants improve on the different areas of the model (thus connecting with and reenforcing the program's learning). Further, these coaches are part of the Slum Challenge exercise, are involved in the expeditions, and I WILL statements. This presence allows them to observe the participant "in action," see where things go wrong, deliver immediate feedback and offer participants tiny tweaks to help them improve, preventing a levelling of the gains in leadership development, even when facing highly challenging situations (DeRue & Wellman, 2009). The logic of tweaking is not a wholesale change of who the person is but incremental improvements that the person can experiment with as they develop as a leader.

As with leaders' development, tweaking is important on a program level – examine where it did well and where it did not and change accordingly.

Conclusion

In navigating our journey of making leadership development more evidence-based, we have examined more closely how the leadership development industry – ourselves included – operate as leadership educators. This exploration has pointed us to develop and adopt the integrity-based thinking for LD, identify the importance of aligning vision, method, and impact in LDPs, but also to consider the significance of often overlooked questions about leadership development. We hope that this chapter provides some food for thought, as well as a tangible tool and examples for leadership developers to embark on this journey with us, working together to strengthen our evidenced-based leadership development community.

Recommendations - *For further reading to assist your evidence-based leadership development:*

Journal articles

- Leroy, H.L., Anisman-Razin, M., Avolio, B., Bresman, H., Bunderson, S., Burris, E., Claeys, J., Detert, J., Dragoni, L., Giessner, S., Kniffin, K., Kolditz, T., Petriglieri, G., Pettit, N., Sitkin, S. B., Van Quaquebeke, N., & Vongswasdi, P. (2022). Walking Our Evidence-Based Talk: The Case of Leadership Development in Business Schools. *Journal of Leadership & Organizational Studies, 29*(1), 5-32.

- Leroy, H., Anisman-Razin, M., & Detert, J. (2024). Leadership Development Is Failing Us. Here's How to Fix It. *MIT Sloan Management Review, 65*(2), 48-53.

Books

- Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010). *How learning works: Seven research-based principles for smart teaching.* John Wiley & Sons.

- Avolio, B. J. (2005). *Leadership development in balance: Made/born. Psychology Press.*

- Riggio, R. E. (2020). *Daily Leadership Development: 365 Steps to Becoming a Better Leader.* Barnes & Noble Press

- de Haan, E. (2021). *What works in executive coaching: Understanding outcomes through quantitative research and practice-based evidence*. Routledge.

References

Avolio, B. J., & Hannah, S. T. (2008). Developmental readiness: Accelerating leader development. *Consulting Psychology Journal: Practice and Research*, *60*(4), 331-347.

Beer, M., Finnstrom, M., & Schrader, D. (2016). The great training robbery. *Harvard Business School Research Paper Series, 16-121.*

Brown, A. D. (2015). Identities and identity work in organizations. *International Journal of Management Reviews*, *17*(1), 20-40.

Day, D. V., Fleenor, J. W., Atwater, L. E., Sturm, R. E., & McKee, R. A. (2014). Advances in leader and leadership development: A review of 25 years of research and theory. *The Leadership Quarterly*, *25*(1), 63–82.

Day, D. V., Riggio, R. E., Tan, S. J., & Conger, J. A. (2021). Advancing the science of 21st-century leadership development: Theory, research, and practice. *The Leadership Quarterly*, *32*(5), 1-9.

Day, D. V., & Zaccaro, S. J. (2004). Toward a science of leader development. In D. V. Day, S. J. Zaccaro, & S. M. Halpin (Eds.), *Leader development for transforming organizations: Growing leaders for tomorrow* (pp. 383–399). Lawrence Erlbaum Associates Publishers.

DeRue, D. S., & Wellman, N. (2009). Developing leaders via experience: The role of developmental challenge, learning orientation, and feedback availability. *Journal of Applied Psychology*, *94*(4), 859–875.

Dragoni, L., Park, H., Soltis, J., & Forte-Trammell, S. (2014). Show and tell: How supervisors facilitate leader development among transitioning leaders. *Journal of Applied Psychology*, *99*(1), 66-86.

Hammond, M., Clapp-Smith, R., & Palanski, M. (2017). Beyond (just) the workplace: A theory of leader development across multiple domains. *Academy of Management Review*, *42*(3), 481-498.

Hannah, S. T., & Avolio, B. J. (2010). Ready or not: How do we accelerate the developmental readiness of leaders?. *Journal of Organizational Behavior*, *31*(8), 1181-1187.

Ibarra, H. (1999). Provisional selves: Experimenting with image and identity in professional adaptation. *Administrative Science Quarterly*, *44*(4), 764-791.

Ibarra, H., & Barbulescu, R. (2010). Identity as narrative: Prevalence, effectiveness, and consequences of narrative identity work in macro work role transitions. *Academy of Management Review*, *35*(1), 135-154.

Inceoglu, I., Legood, A., Zheng, Y., Lang, J. W. B., Gardner, W. L., Anderson, M. H., Sun, P. Y.-T., Zhao, H., Leroy, H., Van den Broeck, A., Howard, J., Belting, R.-C. (2023). The big X of leadership. *Academy of Management Proceedings*.

Kaiser, R. B., & Curphy, G. (2013). Leadership development: The failure of an industry and the opportunity for consulting psychologists. *Consulting Psychology Journal: Practice and Research*, *65*(4), 294-302.

Khattab, J., Van Knippenberg, D., Pieterse, A. N., & Hernandez, M. (2020). A network utilization perspective on the leadership advancement of minorities. *Academy of Management Review*, *45*(1), 109-129.

Lacerenza, C. N., Reyes, D. L., Marlow, S. L., Joseph, D. L., & Salas, E. (2017). Leadership training design, delivery, and implementation: A meta-analysis. *Journal of Applied Psychology*, *102*(12), 1686-1718.

Leroy, H. L., Anisman-Razin, M., Avolio, B. J., Bresman, H., Stuart Bunderson, J., Burris, E. R., Claeys, J., Detert, J. R., Dragoni, L., Giessner, S. R., Kniffin, K. M., Kolditz, T., Petriglieri, G., Pettit, N. C., Sitkin, S. B., Van Quaquebeke, N., & Vongswasdi, P. (2022). Walking our evidence-based talk: The case of leadership development in business schools. *Journal of Leadership and Organizational Studies*, *29*(1), 5-32.

Leroy, H., Anisman-Razin, M., & Detert, J. (2023a). Leadership development is failing us. Here's how to fix it. *MIT Sloan Management Review*, *65*(2), 48-53.

Leroy H. L., Anisman-Razin, M., Van den Broeck, A., Claeys, J., Waltre, E., Schaller, S. & Konduru, R. (2023b). *Strategic Swiping: Asking Better Questions for Leadership Development Programs*. Agoria.

Mercer (2019). *Leadership development trends 2019*. Newark, DE: Mercer Mettl.

Narayandas, D., & Moldoveanu, M. (2019). The future of leadership development. *Harvard Business Review*, *97*(2), 40–48.

Nicholson, H., & Carroll, B. (2013). Identity undoing and power relations in leadership development. *Human Relations*, *66*(9), 1225-1248.

Petriglieri, G., & Petriglieri, J. L. (2015). Can business schools humanize leadership?. *Academy of Management Learning & Education*, *14*(4), 625-647.

Pfeffer, J. (2010). *Power: Why some people have it — and others don't*. New York: Harper Business.

Rousseau, D. M., & Gunia, B. C. (2016). Evidence-based practice: The psychology of EBP implementation. *Annual Review of Psychology*, *67*, 667-692.

Rousseau, D. M., & McCarthy, S. (2007). Educating managers from an evidence-based perspective. *Academy of Management Learning and Education*, *6*(1), 84-101.

Schwartz, S. H. (1999). A theory of cultural values and some implications for work. *Applied Psychology*, *48*(1), 23-47.

Sheldon, O. J., Dunning, D., & Ames, D. R. (2014). Emotionally unskilled, unaware, and uninterested in learning more: reactions to feedback about deficits in emotional intelligence. *Journal of Applied Psychology*, *99*(1), 125-137.

Vongswasdi, P., Leroy, H., Claeys, J., Anisman-Razin, M., & van Dierendonck, D. (2023a). Beyond Developing Leaders: Toward a Multinarrative Understanding of the Value of Leadership Development Programs. *Academy of Management Learning & Education, 23*(1), 8–40.

Vongswasdi, P., Leroy, H., Menges, J., & Le, J. (2023b). How mindfulness qualifies the relationship between negative emotions and developmental outcomes. *Academy of Management Proceedings.*

Vongswasdi, P., Leroy, H., Shemla, M., Hoever, I., & Khattab, J. (2023c). Influencing diversity beliefs through a personal testimonial, promotion-focused approach. *Journal of Organizational Behavior*, *44*(1), 1-18.

Wallace, D. M., Torres, E. M., & Zaccaro, S. J. (2021). Just what do we think we are doing? Learning outcomes of leader and leadership development. *The Leadership Quarterly*, *10*(5), 14-94.

Zhang, Y., Waldman, D. A., Han, Y. L., & Li, X. B. (2015). Paradoxical leader behaviors in people management: Antecedents and consequences. *Academy of Management Journal*, *58*(2), 538-566.

Zhu, J., & Hewett, R. (2022). Paradoxical yet consistent: How leaders maintain behavioral integrity when pursuing paradoxical objectives. *Academy of Management Proceedings*.

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Teaching Evidence-Based Decision-Making by the Numbers

Robert L. “Doc” Waltz

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Teaching Evidence-Based Decision-Making by the Numbers

Robert L. "Doc" Waltz

This paper describes how Los Angeles Pacific University (LAPU) delivers an asynchronous online course in evidence-based decision-making to students in its Master of Arts in Organizational Leadership Program. Combining classic EBMgt components into three categories, *The Six A's*, *PICOC*, and *The Four Sources* students become proficient in using what is referred to as *The 6-5-4 Model.* LAPU uses a whole person approach to adult learning, so who the student is as a person is as important as why they are attending and what they will learn.

Teaching evidence-based decision-making from both a practitioner and academic perspective presents an opportunity to provide structure for students who need it and freedom for students who are more self-directed and independent. In practice, evidence is often collected from multiple sources simultaneously, and that is put into practice in the course. The signature assignment is a combination of a four-part paper that utilizes The 6-5-4 Model and an After-Action Review. Objectivity and story-telling are combined to deliver a final product for delivery to the students' leadership or decision-makers.

Introduction

This paper provides a description of how Los Angeles Pacific University's (LAPU) graduate-level course on Evidence-Based Decision-Making delivers classic EBMgt components into three categories – *The Six A's*, *PICOC*, and *The Four Sources*. Combined, these are frequently referred to throughout the course as *The 6-5-4 Model.* Students who then practice *The 6-5-4 Model* are better equipped to break down the individual components of the problem,

situation, or challenge, create lasting excellence and long-term success in their organizational leadership role, and by doing so, be of greater benefit to the larger community, and society, in which they work.

Los Angeles Pacific University

LAPU is part of the Azusa Pacific University System, located in Southern California, and delivers numerous academic majors in an online, asynchronous eight-week modality. The Master of Arts in Organizational Leadership (MAOL) was launched in 2021, and contains a core course, Evidence-Based Decision-Making. Each course is eight weeks in length, and this chapter describes the Evidence-Based Decision-Making course experience from both the instructor and student perspective.

Los Angeles Pacific University's (2024), introductory statement of Week One provides the rationale for this course being part of the MAOL Program:

Evidence-based management (EBMgt) is not a philosophy or an abstract idea. It is something people do….to make better decisions in an organization. It starts by framing a problem statement and an answerable research question. It is about increasing the probability of making the right decisions and understanding the degree of confidence one can place on that decision. (Week 1, sec. 1)

An Overview of LAPU's Whole Person Approach

LAPU is an online Christian institution of higher learning. "LAPU students are not required to have a profession of faith, so a wide range of worldviews among students is possible, and in fact, present" (Washatka, 2022a, p. 81). LAPU's faculty and staff embrace and celebrate this rich diversity, and detail its approach to the whole person in *Faith, Life, and Learning Online: Promoting Mission Across Learning Modalities,* (Himes & Washatka, Eds., 2022). LAPU has been intentional about "building and nurturing a collaborative culture" (Reynolds, 2022, p. 36).

> As an online university founded on a student-centric paradigm, the starting position is how best to support the student to be successful in their academic aspirations. Serving post-traditional students, many of whom are working adults with multiple transcripts, institutions have a practical and ethical obligation to provide the best possible environment for fast and constant support. (Reynolds, 2022, p.42)

I define post-traditional students as typically being 25 years of age and older, are employed in at least a part-time capacity, and might have enrollment records from more than one college or university. In LAPU's course on Evidence-Based Decision-Making, as with all of its

courses, the course design process began with "the question of who: who are the participants in this course?" (Washatka, 2022a, p. 81). The issues of why the course is being offered, and what "knowledge, skills and attitudes" (Washatka, 2022a, p. 83) will students acquire are also addressed in this collaborative approach to our students' whole-yet-diverse person.

This is accomplished through the principle of incarnational teaching (Wingard, 2002), which promotes integrative and holistic learning, active student participation, learning communities and collaborative processes, and hope (Washatka, 2022b). This approach is responsive to and celebrates the rich diversity of the University's students. "Achieving diversity without equity and inclusion is a failed endeavor" (Phillips, 2022, p. 116). LAPU views diversity as the starting point. "For learning and development, productive engagement with individuals of diverse backgrounds and perspectives is one of the primary purposes of a college education and is a highly desired workplace skill" (Phillips, 2022, p. 106).

Equity and inclusion serve as the bridge between diversity and belonging, and it is LAPU's collaborative focus on our students' sense of belonging that brings the whole person approach full circle. "Psychological well-being and student satisfaction have direct and mediating effects on academic performance, persistence, and graduation" (Phillips, 2022, p. 106).

The design of LAPU's Evidence-Based Decision-Making course began with "why", worked through the "what", but kept a strong focus throughout the process on the "who."

That "who" is the whole person – the student's total well-being. How this is achieved in practice is discussed in the following sections.

The 6-5-4 Model

Students enrolled in the MAOL Program come from a rich diversity of career paths, professions and accomplishments, academic degrees and performance levels, and socio-economic status. To deliver meaningful learning for such a diverse student demographic, it was determined to highlight the main components of EBMgt by using the premise that we learn optimally by grouping things in threes. Using this simple premise allowed for the creation of *The 6-5-4 Model*.

Prior to the opening of each session, I prepare a welcome video that is embedded on the course's home page. It is here that I introduce myself, provide contact information, and advise students that my course in Evidence-Based Decision-Making will be unlike any other course they've taken to date. I tell students what they're *not* going to do so that I begin to shift their paradigm from experiences and assignments in previous courses. I advise them that they are not going to select a specific change model, such as Kotter or Lewin, or a specific organizational effectiveness tool such as Lean, or Six Sigma, or Lean Six Sigma to propose a solution to a specified organizational problem, situation, or challenge. They are not going to propose TQM, or Agile, or Delphi Method, or SWOT.

Rather, they are going to do just the opposite. They are going to go into their organization and select something that the organization currently does or uses, such as any of the models or tools mentioned above. It might be a process, such as the organization's performance appraisal process, or a program, such as onboarding, or Diversity, Equity, Inclusion and Belonging (DEIB), or a system, such as Knowledge Management (KM). Then, using *The 6-5-4 Model*, they acquire, aggregate, assess, and report the findings, make any recommendations, and reflect on the experience.

Each of the eight weeks opens Monday morning at 8:00. Students will find an opening message from me waiting for them. It is here that I provide an overview of the week's content and learning outcomes. Each message was derived from my teaching notes written as the SME for the course. While it is primarily content that I can use each time I teach the course, it is enhanced or updated based on current events and the specific interests and needs of each class. For example, student interest in Work from Home (WFH) policies and practices, Diversity, Equity, Inclusion, and Belonging (DEIB) programs, and new-hire onboarding processes has increased since the Program's launch, and that has influenced content updating and refreshing.

Six, Five, and Four, or *The 6-5-4 Model*, is referred to throughout the course. By grouping in threes, there are (1) six steps, all beginning with the letter A, (2) five components in *PICOC*, and (3) four sources of evidence in EBMgt.

The Six A's

"The Six A's" are Ask, Acquire, Appraise, Aggregate, Apply, Assess. Barends and Rousseau (2018) provide clear definitions for each, and that is where I begin my instruction to my students. The following is an example taken from my teaching notes and how I use them in class:

Six, Five, Four. Those numbers are important for understanding the basics of Evidence-Based Management. Let's look at them one at a time.

First, let's look at Six. There are Six steps to Evidence-Based Management. But what is Evidence-Based Management?

Evidence-Based Management is about making decisions through the conscientious, explicit and judicious use of the best available evidence from multiple sources by Asking, Acquiring, Appraising, Aggregating, Applying, and Assessing. In this course, we will refer to these six steps as "The Six A's." Using a metaphor for clarity, imagine that there are six rivers. Their names are Ask, Acquire, Appraise, Aggregate, Apply, and Assess. Their point of confluence is a place called "Evidence-Based Management." While they are in fact flowing independently, they can be observed, checked, measured, and managed in various combinations or altogether.

The Six A's are:

1. **ASK!** Translating a practical issue or problem into an answerable question. Ask builds the foundation for everything that follows. As the foundation, Ask! really means "critical inquiry."
2. **ACQUIRE!** Systematically searching for and retrieving the evidence.
3. **APPRAISE!** Critically judging the trustworthiness and relevance of the evidence.
4. **AGGREGATE!** Weighing and pulling together the evidence.
5. **APPLY!** Incorporating the evidence into the decision-making process.
6. **ASSESS!** Evaluating the outcome of the decision taken.

The Six A's are foundational but extremely important to evidence-based practice, so become as familiar with them as you can!!!

PICOC

PICOC (pronounced "peacock" in videos and outside-of-class meetings) is a five letter acronym for Population (Who?), Intervention (What or How?), Comparison (Compared to what?), Outcome (What are you trying to accomplish/improve/change?) and Context (In what kind of organization/circumstances?). These are five elements that will be relevant to the research question or problem statement, with each element possibly producing a different answer for the students. For almost all students, time constraints prevent them from initiating an intervention (I), but they are expected to share in class and the final part of their signature assignment what the proposed intervention is. And perhaps most importantly, students utilize the *I* in *PICOC* in their last course, the Capstone Project.

The Four Sources

The Four Sources of evidence are **Practitioners**, **Scientific Literature**, the **Organization**, and **Stakeholders**. In Week One, I provide students with a combination of (1) my own practitioner information, (2) scientific literature, and (3) anecdotal information, sometimes in the form of story-telling (Giluk & Rynes-Weller, 2012).

1. Practitioners

As a practitioner, I am acutely aware of the value of concurrent processing – the effective integration of related functions, processes, and events. If for no other reason, this comes from over twenty years of employment in the aerospace industry. I am equally aware that there can be multiple sources of the same type of evidence, particularly evidence from Practitioners.

Therefore, I define Practitioner evidence thusly:

The professional experience and judgment of the managers, consultants, organizational leaders, and other practitioners, such as process owners, who have professional experience accumulated over time. Practitioner evidence can be acquired from three sources: (1) those operating outside the organization (external practitioner evidence), (2) practitioner findings within the second source, Scientific Literature, and (3) those operating within the organization (internal practitioner evidence).

2. Scientific Literature

Findings from empirical studies published in peer-reviewed academic journals. Sometimes, studies will provide data on or about specific Practitioners. Since we will be acquiring evidence from Practitioners and Scientific Literature concurrently, such evidence can be placed under either section, but the source needs to be clearly identified.

2. The Organization

Data, facts and figures collected from the organization itself. Organizational evidence comes in many forms, including its processes, practices, procedures, and systems. The organization's Knowledge Management (KM) System, command media/records, financial information, human resources, and production and quality are just a few possible sources. Often in the process of acquiring evidence in the form of data, facts, and figures from the organization, practitioner evidence can also come from the employees themselves. That is to say that when employees are also practitioners, we can include that evidence under Practitioner, as discussed above under Practitioners, or identify such as practitioner evidence acquired during our retrieval of evidence from the Organization.

4. Stakeholders

Stakeholders are those who might be affected by organizational decisions and their consequences. Internal stakeholders include organizational employees and certain leaders affected by Practitioner decision-making. External stakeholders include customers, or those served by the organization, customers, shareholders, governmental agencies, and the public at large.

Caution must be taken to avoid overlap between evidence from Practitioners and evidence from Stakeholders. I advise my students to identify their Stakeholders early in the process in order to clearly differentiate them from Practitioners (John Hopkins University & Medicine, 2023).

Final Thoughts on The 6-5-4 Model

The 6-5-4 Model acknowledges situated expertise, sometimes referred to as situated knowledge, which is the proficiency and judgment acquired through experience and practice, as discussed in Wright et al. (2015). I emphasize this during the Aggregate stage, where students pull together and weigh the collected evidence. Evidence is not proof (Barends & Rousseau, 2018), so drawing on situated expertise facilitates the concurrent collection of evidence from multiple sources so that an estimate of probability can ultimately be determined.

Additionally, I caution students during Week 2 that knowledge and experience are not the same thing. From the combined practitioner and academic perspective, I have come to believe that knowledge is the accumulation of facts, data, information, and ideas, while experience comes from participation in and/or observation of events in motion. It is during Week 2 that students explore proving something vs. establishing probability or likelihood. I use exploration in space as an example. We proved that we can land on the Moon. We did not prove that we can land on the Moon every time we try.

As discussed above, my students represent a diverse demographic, but all of my students are adult learners. Adult learners are not mere sponges – they are better than that. In that vein, I intentionally avoid using the word "student" when addressing them. Rather, addressing them as "critical inquirers" simultaneously challenges them and offers light-hearted humor. I introduce and repeat two questions, weaving them through the entire course's content to keep things in balance:

1. What is it that I do not know?
2. What questions am I not asking?

This serves as a constant reminder of the critical inquiry element of being an EBMgt practitioner in the field of organizational leadership. This also addresses the consequences of not being a critical inquirer –what I refer to as "The Pitfalls." The Pitfalls are:

- Underestimating the scope of the assignment.
- Choosing the wrong topic.
- Not utilizing concurrent processing.
- Not considering bias.
- Not considering limitations/barriers to access of evidence.
- Using poor or outdated sources.
- Not seeing the bigger picture (common themes and patterns) develop in real time.

The Course

Serving as the Subject Matter Expert (SME) on the course design team, I deliberately chose to make the curriculum as learner-centric as possible. I had already chosen Barends' and Rousseau's book, *Evidence-Based Management: How to Use Evidence to Make Better Organizational Decisions* (2018). As a US Army combat veteran, a retired aerospace manager, and a faculty member with over twenty-five years of teaching working adults, I want to deliver a course that balances academic rigor with practical application (Blanchard, 2020; Lugara, 2023; Rynes & Bartunek, 2017) for advancing the student's corporate citizenship, corporate stewardship, and ethical worldview - what I like to refer to as "meaningful" learning (Waltz, 2004). This supports (1) the care for the "whole person" approach to higher education that LAPU delivers, (2) the integration of "what works" with "what matters" so that students deliver a "what matters/works here" recommendation (Tomkins et al., 2021, Final thoughts section, para. 3), and (3) my expectation that students place a value on their evidence during the Aggregating and Applying stages in Part 4 of the assignment.

The faculty member approves the topic based on the criteria established in the course and discussed above in The 6-5-4 Model. Students create the research question and/or problem statement, using Wilson (2014) and Creswell & Creswell (2023) as their guide. This must be intentionally and purposefully written, so that it is "searchable." This approach is presented in class as the foundation upon which EBMgt is built.

Students then ask, acquire, and appraise for each of the four sources of evidence. In the real world, evidence from these four sources can be acquired and appraised concurrently. This is can make sense from a practical perspective, but also because "organizations want better results, yet they often dictate resources (people and money)" (North, 2023, p. xi). In our course, students simultaneously acquire and report on evidence from practitioners and the scientific literature (Weeks 2 and 3), and then simultaneously report on evidence from the organization and stakeholders (Weeks 4 and 5). Students then aggregate the evidence (pull it all together) and propose how it might be applied (Weeks 6 and 7). The last A in *The Six A's*, Assess, is typically a view into the future, as students will most likely not have had sufficient time to initiate an intervention and report on its outcome. This is accomplished in Week 8, which is titled, Building an EBMgt Culture. The following section discusses this in detail.

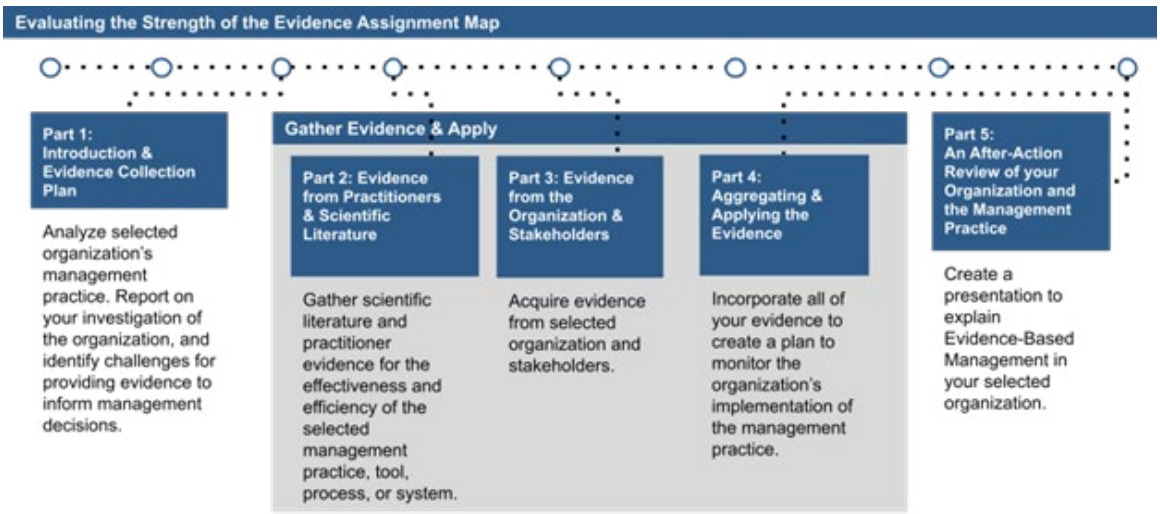
The Course's Signature Assignment

The signature assignment is broken out into four progressive and cumulative parts, with a fifth part being an After Action Review. Near the end of Week 1, I provide my ten-minute narrated instructional video that walks students through the course's signature assignment.

The Paper

The signature assignment is cumulative, so students are instructed to include all previous Parts when submitting a new one. They are also encouraged to make revisions, edits, or changes, based on faculty feedback, to the previously-submitted Part prior to submitting the next one (although these previous parts are not re-graded).

APA compliance is required, including the placement of headings. Evidence-based anything is better presented with intelligently and intentionally placed signposts, and headings serve to organize and synthesize the work.



Part 1: Introduction and Evidence Collection Plan.

First and foremost, I remind students that this is a unique course. They are not merely going to identify a problem, challenge, or situation and provide recommendations for change or improvement. This is a step-by-step evidence-based approach to decision-making.

In Part 1 students introduce the organization that they will examine, and identify one of its management practices, organizational effectiveness tools, processes, or systems. They explain the reason(s) for their selection. They offer initial, often subjective or perceptual, information on level of quality (reliability and accuracy), reputation or "popularity", relevance, and general value. The collection of evidence begins with Part 2, but students are required to support their plan for collecting evidence with at least two scholarly sources.

Part 1, due the first day of Week 4, is 2-3 pages (500-750 words) in length, with at least two authoritative sources (one may be the Barends & Rousseau text). To prepare students for meeting the upcoming requirements, I advise them to pursue best available evidence (Rousseau, 2012; Jelley et al., 2012). Some scientific literature might come at a cost to the student,

or have an unacceptable lead time for delivery. Some organizational evidence might have limited access or need-to-know classification. Some stakeholders might not be available, or might be reluctant to be interviewed. So a systematic approach (Briner & Denyer, 2012) to *The 6-5-4 Model* presents a higher likelihood of acquiring meaningful evidence.

Part 2: Evidence from Practitioners & Scientific Literature.

In Part 2, due the first day of Week 5, students report on the scientific evidence collected for the effectiveness and efficiency of the practice, tool, process, or system selected. Scientific literature can and often does discuss how a practice, tool, or process is or has been used, so I urge my students to break out any "practitioner" evidence from the scientific literature, and use headings to do this. This is supported by my experience and background as a practitioner, where I found that practitioner evidence could, and more than likely would, be found in scientific literature.

Scientific literature is scholarly and peer reviewed public research (Barends & Rousseu, 2018). It is used to "indicate evidence that is valid, reliable, generalizable, has been replicated, was derived in a transparent manner, and to indicate that [the] published literature is representative of all evidence" (Kepes et al., 2023, p. 447). Students check for credibility by a review of the author's credentials, education, experience in the field, and/or affiliations to institutions, organizations, or associations. Every attempt is made to find foundational and/or seminal research.

The following instructions are provided to students for completing Part 2:

1. Using at least three scholarly and peer-reviewed journal articles that were published with the last 5 years, determine if scientific evidence exists for the effectiveness and efficiency of your selected management practice, process, or tool.
2. Incorporating your Instructor's feedback and suggestions from Part 1, write Part 2 on how your search was conducted, the article that you found, and the conclusions that were drawn from the research.
    - What databases and search engines did you use?
    - Is there scientific evidence that the selected management practice, process, or tool is likely to be effective and efficient?
    - How did you come to your conclusion?

So in Part 2, students break out that portion of evidence as being separate from the practitioner evidence they will acquire from the organization. In this approach then, practitioner evidence is external to the organization.

It is in Part 2 that students are to utilize the *PICOC Method*, and again, do so with appropriate headings. Part 2 is to be 3 pages (750 words) in length, with at least three additional peer-reviewed, scholarly sources (bringing the minimum to five).

Part 3: Evidence from the Organization and Stakeholders.

In Part 3, due the first day of Week 6, students report on the evidence acquired from the organization and its stakeholders. Processes, policies, practices, and/or systems are examined. Students are urged to practice MBWA (Management by Walking Around). The users of these processes, policies, practices and/or systems then are the internal practitioners, and in some cases, the process owners. Students are urged to "go beyond the subject experts to people who are doing the work" (North, 2023, p. 95). In my experience, that is where the real process ownership resides. As such, they possess experience and expertise in the trenches.

Stakeholders are the recipients, or beneficiaries, of this experience and expertise, and can be internal, such as fellow employees, or external, such as customers, suppliers, and community members (local, regional, national, international). Necessarily included in this last source of evidence is a shared responsibility for sustainability – a values-based approach – even when disagreement about how the organization and its stakeholders coexist (Hutton & Olsen, 2015). This is important in order to take into account both parties' expectations, perceptions, and points of view.

Students are now placed in the role of acquiring primary evidence, so they are urged to determine credibility of the evidence. Questions students can keep in mind when acquiring evidence from the organization and its stakeholders are:

- Did the respondents understand the questions?
- Did the respondents feel comfortable and safe in responding? (Leedy & Ormrod, 2019; Zikmund et al., 2013).

Finally, to avoid potential bias, did the student make every attempt to balance personal and professional experience and affiliation with situated expertise? (Leedy & Ormrod, 2019; Wright et al. 2015). Students are allowed to include subjective commentary, such as participant/practitioner observations and experiences, in Part 3 as appropriate, but are expected to identify it as such. "Perhaps not surprisingly, practitioner expertise tends to be the most highly valued of the four sources of evidence, especially by the experts themselves" (Potworowski & Green, 2012, p. 280).

Accordingly, a logic model (Barends & Rousseau, 2018), appropriate for this assignment, can be formulated to guide students through the collection of evidence from the organization. Barends & Rousseau (2018) list several possible barriers to critically appraising organizational evidence, including irrelevant or inaccurate data and missing contextual information. Critically appraising evidence collected from the organization can be accomplished by being

mindful of its quality vs. purpose. That is to say that the evidence is "used by different kinds of people for different kinds of decisions requiring different kinds of quality" (Barends & Rousseau, 2018, p. 219).

With the combined evidence from external and internal practitioners now in hand, coupled with the evidence from the organization and its stakeholders, students are well-positioned to share their findings with those internal practitioners they feel are best suited to help "evaluate the four sources of evidence" (Potworowski & Green, 2012, p. 280). Part 3 is to be 3-4 pages (750-1000 words) in length, with at least three additional peer-reviewed, scholarly sources (bringing the minimum to eight).

Part 4: Aggregating and Applying the Evidence.

Managers are decision-makers. Evidence-based managers are mindful decision-makers, but evidence alone is not enough. Evidence-based managers build evidence-based capacity among others through increased empowerment and accountability, and by raising the awareness of organizational and individual value that evidence-based practice brings.

Consequently, students are asked to place a value on their evidence:

- Are there any risks or limitations?
- Have there been any past or current interventions? If so, why and briefly describe results or expectations.
- What, if any, interventions do they now propose?
- What are the key next steps for dissemination, implementation, change?
- How will they monitor progress (performance indicators)?
- Last, students are asked to reflect on the experience:
- How can they build an evidence-based organizational culture?
- Keeping within the whole person context, students are to consider any ethical issues or concerns with regard to beneficence, respect, justice, and social responsibility.

This final written section, due the first day of Week 8, is required to be 3-4 pages (750-1000 words) in length, with at least three additional peer-reviewed, scholarly sources, (bringing the minimum to eleven). I ask students to be specific as to where evidence from Practitioners was acquired, recognizing the three possible sources as discussed above. This supports my emphasis on critical inquiry under Ask, the systematic searching and retrieving under Acquire, and the pulling together under Aggregate.

Part 5: *The After-Action Review* - A Narrated Video.

Part 5 is the After-Action Review. It is also due the first day of Week 8. In the spirit of the concurrent processing found throughout the course and the rea- l world, students aggregate and apply the collected evidence in both written and video form. Consequently, this assignment, in the form of a formal, narrated video presentation, is required as the concluding part of the signature assignment.

As a practitioner, I believe that After-Action Reviews in EBMgt need to be much more than facts and data. Literature on how evidence-based practitioners can be influential in promoting change supports being a storyteller (Heath & Heath, 2008; Giluk & Rynes-Weller, 2012; Knaflic, 2015). Telling a good story often requires playing a role, and that is coached in our course. The role I coach has less of an academic voice and more of a persuasive narrative. In Week 7's opening message, I provide the following:

> Literature on how evidence-based practitioners can be influential in promoting change supports being a "storyteller." Learn how to tell a good story. Stories are lifelike, and connect with our real-world experiences. Metaphors, and appropriately placed humor, can be very effective. Be a narrator rather than a reader. (Think of a narrated documentary or program you've seen, and how the narrator never sounds like he/she is reading from a script). A simple standard for performance is "You know it, show it." (R.L. Waltz, personal notes, May, 2020)

Some of LAPU's students have a large and high level span of control, while others are just starting to get their feet wet in the leadership trenches. Furthermore, the outcomes of each student's *6-5-4* are varied. For some, the need for drastic change is evident. For others, celebration of a best practice might be appropriate. And still for others, the evidence falls somewhere in between.

For example, one recent student, employed at a large healthcare facility, examined her organization's employee performance process. She found that (1) there was significant irregularity in scheduling reviews, and (2) that adoption of a 360-degree assessment/feedback model would be more in line with the aggregated evidence. Another recent student, employed at a pharmaceutical company, examined her Human Resource's department usage of a SWOT Analysis template as the primary strategic tool for addressing employee attrition and improving retention. After aggregating the evidence, she made a recommendation to her leadership that Six Sigma be considered as a best appropriate replacement for the SWOT Analysis template.

No matter the outcome, the story needs to be told, if for no other reason than the work required to write it.

"Role play can be a powerful tool to help develop effective behavior as a manager" (Cohen, 2020, p. 5). In their narrated video presentation, students role play as themselves, in their

current capacity and position in the organization. Therefore, they might present to their leadership or decision-makers – those with the power and authority to act as change champions or sponsors on their behalf. Or, students might possess that power and authority themselves, so they present to their followers their vision for change (Kotter, 1996; Kotter, 2021). In this role playing, students meet two key objectives - they complete the requirements for LAPU's course in Evidence-Based Decision-Making, and, deliver a high stakes dry run in preparation for the real thing at work; which I strongly encourage them to make sure happens.

Students are encouraged to be professional yet personable; keep it simple and on time; don't be reluctant to infuse some humor where and when appropriate; be themselves; and know their audience. They lived it, now tell it. Storytelling is the vehicle for delivering meaningful facts and data to their designated destination, without detour or delay. Storytelling, balanced by style and substance, can engage and inspire; connect people and purpose; combine vision and value (Giluk & Rynes-Weller, 2012, Wright, et al. 2015). "Crafting new stories forces business leaders to commit to cultural change in a way that creating new HR policies or cultural charters doesn't. Once the stories have spread throughout the organization, they're difficult to disavow or dislodge" (Barney, et al. 2023).

The grading criteria for the narrated video is as follows:

- Use incomplete sentences and bullet points for all slides.
- Every picture tells a story.....or..... A picture is worth a thousand words. Use graphs, charts, graphics, clip art as appropriate.
- Don't read! Literature on how evidence-based practitioners can be influential in promoting change supports being a "storyteller." Learn how to tell a good story. Stories are lifelike, and connect with our real-world experiences. Metaphors, and appropriately placed humor, can be very effective. Be a narrator rather than a reader.
- Have a business-appropriate opening/greeting and closing/conclusion. "OK, this is my presentation on ....." and "That's it" are not appropriate. "Hello. My name is xxxx. Thank you for coming this morning. For the next 10 minutes I'm going to walk you through the evidence we've collected recently on how we utilize (practice/tool/process) compared to other practitioners. We're going to review our internal processes, some of the scientific literature on the subject, and share some feedback received from stakeholders. We'll close with a few recommendations. Let me begin by briefly explaining the 6-5-4 Model of Evidence Collection before I share with you the evidence I collected." Leave your audience with a memorable closing. Remember that evidence-based decision-making might be a new concept for your audience, so you want to leave them envisioning and even embracing the diligence you put into this as well as your findings and recommendations.

- Spend a little time walking through the 6-5-4 Model and then get right into what you found and what you think ought to be done about it. And remember--don't be reluctant to be a storyteller to get your points across.

My Experience in the Classroom

I have enjoyed a very positive and rewarding experience in the classroom. Teaching exclusively online in an asynchronous modality, however, is definitely a two-sided coin. The convenience of being able to teach from any location that has either WIFI or cellular connectivity is an obvious plus. But that lacks the personal and real-time climate and conditions that face-to-face classrooms offer. Therefore, accessibility via text messaging and phone calls is imperative. My own practitioner skills are kept sharp by serving as an instructor, facilitator, coach, and consultant. But in every session, there are invariably some students who, despite the emphasis that the course will be unlike any other course they've taken to date, still need a little extra push to shift the paradigm discussed above. I provide immediate and clarifying responses (no later than next day) to student posts that indicate the need. This also emphasizes the importance of faculty accessibility via text messaging and phone calls.

I have been particularly pleased with how the learning outcomes in LAPU's Evidence-Based Decision-Making course are used by students in the MAOL's Capstone Project course. I served as the SME for that course as well, and to date, have been the only faculty member to teach it. Applying the *6-5-4 Model* has been very valuable, in total or in part, to the proposal, research, and delivery stages of numerous students' Capstone Project. As an example, students have used evidence collected from the *6-5-4 Model* to (1) create workplace learning and development modules for DEIB, (2) create new methodologies and pathways for mentoring emerging leaders, (3) use artificial intelligence (AI) for piloting a new student tutoring program, and (4) launch a formal workplace culture shift, titled "Innovation Creation Time", in which employees are allotted time and resources to better engage in the organization's mission and vision through robust organizational improvement initiatives.

What Our Students Say

To date, I have been the only faculty member to teach LAPU's Evidence-Based Decision-Making course, so I have received all of the end-of-course survey results, and the instructor the students refer to is me. The following is a sample of the qualitative results of those surveys:

- *I was interested to learn, the assignment work was quite well structured and provided a good challenge.*
- *The way the assignment is set up, in a progressive way keeps you engaged.*

- *I love how much time was taken to build tools to help with our success in this course.*
- *(The Instructor) creates a welcoming and supportive learning environment.*
- *I also felt as though the other students were all doing what we could to help each other.*
- *Make your research area as specific as possible while balancing specificity with available research.*
- *Plan ahead - use a planner. Start assignments early and ask questions. Be encouraged.*
- *Plan ahead and don't wait [until the] last minute to complete your assignment*
- *The course is unique and valuable. I'm grateful for the opportunity.*

However, it is noteworthy that one student, who identified in the end-of-course survey that they were not a business person, offered the following:

- *As someone who is coming into the [course] without any prior business knowledge, this course was incredibly challenging for me to be able to follow and understand. I would highly recommend reviewing the course instructions and come up with a way to make this course more approachable for those who do not have business undergrad degrees. Thankfully, the instructor for this course is incredibly responsive and very helpful with helping bridge that gap. Some aspects were somewhat unclear, expectations could be broken down and expressed in more detail. However, I managed to understand [the] majority of [what] was expected and complete[d] [the] work to the best of my ability.*

As a result of this feedback, I replaced course content that emphasized business and business applications with a broader focus and applicability for all professions and career paths, consistent with the diverse range of professional accomplishment, professions, and career paths mentioned above.

Conclusion

A series of small victories (Kotter, 1996; Kotter, 2021) can lead to cultural shifts. Understanding the organizational culture, and discerning where evidence-based decision-making might find a fit, will ultimately establish its credibility (and its practitioners!). Because there is little if any time for a real intervention in the PICOC mode, I ask my students to ask themselves

two questions – "What is it that I do not know? What questions am I not asking?" I submit that questions like these "are potentially of great value to both management researchers and management practitioners" (Briner & Denyer, 2012, p. 127). Doing so, and developing even a cursory response, better prepares my students for taking the course's learning outcomes with them to work, and finishing the story.

In serving as the SME for LAPU's Evidence-Based Decision-Making graduate-level course, I wrote the following as part of its Course Vision:

> Considering the pace of change, the multi-cultural, multi-generational workforce, and the highly competitive nature of current business globalization environments, organizations need leaders who value people from different cultures and are competent and confident in their ability to develop strategies that create and foster diversity of thought and inclusion in the workplace. (R.L. Waltz, personal notes, May, 2020).v

LAPU's whole person approach is one of stewardship of the "who" attends our classes. We are their stewards, their facilitators, their coaches, their mentors, in the truest of andragogical (adult learning) tenets (Lindeman, 1926; Brookfield, 1986; Knowles, 1988; Waltz, 2004; Merriam & Bierema, 2013; Merriam & Caffarella, 2020). We view our students as stewards as well. Our students are stewards of their own growth and advancement in skills, talents, strengths, and techniques, as measured by academic learning outcomes in the classroom, by victories and defeats in the real world, and by an increasingly informed worldview. As students begin the task of aggregating and assessing, reflecting on the evidence-based journey, and preparing their final written report and narrated video, I use painting as a metaphor, and share the following in class in my own stewardship role:

> We get the colors and the brushes. We examine what we've collected, and then look at our canvas. We have an idea of what we've got and what we're going to have when all is said and done. But it's not until we start putting the paint on the canvas with the brushes that a picture starts to emerge.
>
> That's art. We're dealing with evidence here in class. So the picture that emerges for us is less our "design" and more an "organizavion and synthesis" of data and information from a variety of sources. In that sense, we are restricted in how we "design" because of the objectivity demanded by both the evidence and the process. The evidence paints the picture. (R.L. Waltz, personal notes, May, 2020).

Viewing that picture, from a distance and up close, and looking at what we do (or more to the point, what we think we do) with what others do or have done can actually teach us two things – (1) how much internal process shift has occurred between what we thought we were doing and what we are actually doing, and, (2) how we measure up against others. As stated above, my students have lived it, so tell it. Paint the picture by the numbers. Every picture tells a story, and a picture's worth a thousand words.

References

Barends, E., & Rousseau, D. M. (2018). *Evidence-based management: How to use evidence to make better organizational decisions.* Kogan Page.

Blanchard, K. (2020, May/June). High-involvement change leadership. *Chief Learning Officer, 19*(4), 15.

Barney, J.B., Amorim, M., & Julio, C. (2023, Sep/Oct). Creating stories that change your company's culture. *Harvard Business Review.*

Blount, S. & Carroll, S. (2017, May 16). Overcome resistance to change with two conversations. *Harvard Business Review.* https://hbr.org/2017/05/overcome-resistance-to-change-with-two-conversations.

Briner, R.B. & Denyer, D. (2012). *Systematic review and evidence synthesis as a practice and scholarship tool.* (D.M. Rousseau, Ed.). Oxford Library of Psychology.

Brookfield, S.D. (1988). *Understanding and facilitating adult learning*. Jossey-Bass.

Cohen, D. (2020). *Developing management proficiency: A self-directed approach.* Routledge.

Creswell, J.W. & Creswell, J.D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches*. SAGE Publications.

Giluk, T.L. & Rynes-Weller, S.L. (2012). *Research findings practitioners resist: Lessons for management academics from evidence-based medicine* (D.M. Rousseau, Ed.). Oxford Library of Psychology.

Hanson, K.O. (2015). *The role of leader in shaping the ethical culture of the corporation.* (S.A. Mohrman, J. O'Toole, & E.E. Lawler III, Eds.). Greenleaf Publishing.

Heath, C. & Heath, D. (2008). *Made to stick: Why some ideas survive and others die.* Random House.

Himes, B.M. & Washatka, J.W. (2022). *Faith, life, and learning online: Promoting mission across learning modalities.* Cascade Books.

Hutton, B. & Olsen, T.D. (2015). *Sustainability in the developing world: An exploration of corporate responsibility and efficacy in promoting social justice.* (S.A. Mohrman, J. O'Toole, & E.E. Lawler III, Eds.). Greenleaf Publishing.

Jelley, R.B., Carroll, W.R., & Rousseau, D.M. (2012). *Reflections on teaching evidence-based management.* (D.M. Rousseau, Ed.). Oxford Library of Psychology.

John Hopkins University & Medicine. (2023). *Nursing resources: What is the John Hopkins nursing evidence-based practice model*? Retrieved January 11, 2024, from https://browse.welch.jhmi.edu/nursing_resources/jhnebp

Kepes, S., Bennett, A., & Mcdaniel, M.A. (2023). Evidence-based management and the trustworthiness of our cumulative scientific knowledge: Implications for teaching, research, and practice. *Academy of Management Learning and Education, 13*(3), 446-466.

Knaflic, C.N. (2015). *Storytelling with data*. Wiley.

Kotter, J.P. (1996). *Leading change.* Harvard Business School Press.

Kotter, J.P. (2021). *Change: How organizations achieve hard-to-imagine results despite uncertain and volatile times*. Wiley.

Leedy, P.D., & Ormrod, J.E. (2019). *Practical research: Planning and design.* Pearson.

Lindeman, E.C. (1926). *The meaning of adult education*. Harvest House Ltd.

Los Angeles Pacific University. (2024). *The basic principles of evidence-based management (EBMgt): What it means to be an evidence-based manager*. ORGS 530.

Lugara, N.P. (2023, March). Capture and disseminate. *Talent Development, 77*(3), 46-51.

Merriam, S.B. & Bierema, L.L. (2013). *Adult learning: Linking theory and practice*. Jossey-Bass.

Merriam, S.B. & Caffarella, R.S. (2020). *Learning in adulthood*. Jossey-Bass.

North, C. (2023). *Learning experience design essentials.* ATD Press.

Phillips, L. (2022). *Diverse faith perspectives*. In B. M. Himes & J. W. Washatka (Eds.), *Faith, life, and learning online: Promoting mission across learning modalities.* (pp. 102-117). Cascade Books.

Potworowski, G.A. & Green, L.A. (2012). *Culture and evidence-based management.* (D.M. Rousseau, Ed.). Oxford Library of Psychology.

Reynolds, J. (2022). *Building a culture of collaboration.* In B. M. Himes & J. W. Washatka (Eds.), *Faith, life, and learning online: Promoting mission across learning modalities.* (pp. 35-46). Cascade Books.

Rousseau, D. (2012). *Envisioning evidence-based management.* (D.M. Rousseau, Ed.). Oxford Library of Psychology.

Rynes, S.L. & Bartunek, J.M. (2017). Evidence-based management: Foundations, development, controversies and future. *Annual Review of Organizational Psychology and Organizational Behavior, 4*, 235-261. https://www.annualreviews.org/doi/full/10.1146/annurev-orgpsych-032516-113306

Tomkins, L. & Bristow, A. (2021). Evidence-based practice and the ethics of care: 'What works' or 'what matters'? *Human Relations 76*(1), 118-143.

Waltz, R.L. (2004). *The 21st century andragogue: The search for mission and meaning in the adult classroom.* [Unpublished doctoral dissertation]. Azusa Pacific University.

Waltz, R.L. (2020). *Personal notes on evidence-based decision-making.* Los Angeles Pacific University.

Washatka, J. (2022a). Christian worldview. In B. M. Himes & J. W. Washatka (Eds.), *Faith, life, and learning online: Promoting mission across learning modalities.* (pp. 77-89). Cascade Books.

Washatka, J. (2022b). Incarnational practices for faith formation. In B. M. Himes & J. W. Washatka (Eds.), *Faith, life, and learning online: Promoting mission across learning modalities.* (pp. 152-165). Cascade Books.

Wilson, J.W. (2014). *Essentials of business research: A guide to doing your own research project*. SAGE Publications.

Wingard, R.W. (2002). An incarnational model for teaching in the church. *Quarterly Review, 2,* 45-57.

Wright, A.L., Zammuto, R.F., Liesch, S.M., Hibbert, P., Burke, J., & Brazil, V. (2015). Evidence-based management in practice: Opening up the decision process, decision-maker and context. *British Journal of Management, 17*, 161-178.

Zikmund, W.G., Babin, B.J., Carr, J.C., & Griffin, M. (2013). *Business research methods*. Cengage Learning.

About the Author

Robert L. "Doc" Waltz has an Associates Degree in Police Science, a B.S. in Business Administration, a Master of Arts in Organizational Management, and my doctorate is in Educational Leadership with an emphasis in higher education. My dissertation was a mixed methods study that focused on the key precepts of andragogy – the theory and practice of teaching adult learners.

I retired from my corporate career after 9/11 with approximately thirty years of experience in domestic and international business management (mostly in high tech and aerospace project management).

I began teaching adult learners in 1997 as an adjunct professor, while employed fulltime as a department head in the aerospace industry. I became an adjunct professor with Azusa Pacific University's (APU) School of Business in October 2001. I have been full-time with APU, and most recently, Los Angeles Pacific University (LAPU), which is part of the APU System, since February 2002. I have been a full-time faculty member with LAPU since 2014. I served as a Lead Professor and subject matter expert (SME) in the Bachelor of Science in Organizational Leadership (BSOL) Program's Cohort Model, and as a faculty member and SME in the Masters in Leadership and Organizational Studies (MLOS) Program, where I taught Group and Team Dynamics, Organizational Behavior, Improving Quality and Productivity, and Strategy and Planning.

I currently teach throughout the BSOL Program and the Bachelor of Arts in Organizational Leadership (BAOL) Program on an individual course-by-course basis. I am the SME for the BAOL's Capstone Project. I also teach Evidence-Based Decision-Making (ORGS530), Leading with Moral Excellence (ORGS550), and Organizational Leadership Capstone (ORGS690) in the Master of Arts in Organizational Leadership (MAOL) Program. I am the SME in all three courses.

Developing a Data Strategy for Evidence-based Management

Christian Criado-Perez

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Developing a Data Strategy for Evidence-based Management

Christian Criado-Perez

The practice of EBM in the work environment requires substantial organisational support. That is, a team or individual might be skilled and willing to adopt evidence-based practices but these efforts can be thwarted when the organisation does not embrace such a paradigm for management practice. EBM is not only a decision-making approach requiring several tasks and skills from decision-makers, it entails a different way of approaching management and as such it also requires an organisational strategy that permits and complements its practice. This is particularly the case when decision-makers aim to gather insights from the growing body of organisational data that is available to them. Out of the four sources of evidence that EBM emphasizes (i.e., scientific research, organizational data, stakeholder perspectives, decision-maker expertise) organizational data is becoming an increasingly valuable asset and enabler of EBM. Digital technologies are increasing our digital footprint and the availability of relevant data, as well as facilitating the collection and analysis of this valuable data. However, organizational data can be the most challenging source of evidence to engage with. It is often scattered, unstructured, noisy, or simply not accessible. Thus, once again, the onus is on the organization to make sure that relevant organizational data is stored and updated, accessible, and fit for use to inform decision-making.

Considering this, I recently began teaching a short course called 'Developing a data strategy' at AGSM, University of New South Wales. This course is designed for experienced managers – regardless of their sector or level of expertise in the use of data – with an interest in data strategy and on preparing their organisation to make more data-driven decisions. Students include executives, managers and MBA students from a wide range of roles and industries. From the start, the students appreciate that data is becoming a critical asset and want to be part

of an organisational shift whereby they increase their firm's capability to create and capture value from data. However, they often find that numerous barriers get in the way of data-driven decision-making. A frequent issue highlighted by students is the messy and scattered state of organisational data. This, combined with the multiple opportunities to make better decisions by drawing on this source of evidence leads them to an overwhelming feeling of not knowing where to focus their efforts. That is, they have a sense that there is an opportunity, but they struggle to identify where to start, what problems to try to address through data, and what actions are necessary to facilitate an evidence-based approach to such problems.

My approach to assisting students in solving those issues is to guide them to reflect on how their organizations and their customers can benefit from more data-driven decision making, and provide some practical tools that they can utilise to build a roadmap towards stronger data capabilities through a coherent data strategy. Importantly, the course aims to illustrate the important role of data, and shift the student's mindset about how management problems can be understood and addressed. Instead of focusing on the scientific literature as a source of evidence, which is often at the forefront of EBM education, I focus instead on the use of evidence that they are familiar with – organizational data – and on the strategic steps necessary to capitalise on that data. The course takes a student-led approach, whereby I minimise the amount of time lecturing during our classes. Instead, I provide examples and educational sources for them to engage with and prepare for class, and we use our time together to go through several exercises in small groups, allowing students to engage in discussions and learn from their peers.

Overall, the course stresses the benefits of taking a step back and understanding the business model and the firm's environment to then identify the opportunity to create or capture value through organisational data. In doing so, I encourage students to engage in future-thinking to appreciate how their sector might be evolving in the future, which often heightens the need for a more efficient use of data. From this point on, I emphasize two key points. First, that the increasing volume of real-time data and our growing capabilities to understand complex associations are changing the strategic paradigm, making information and evidence-based insights a key differentiator between the firms that thrive or fail. Second, that to benefit from the opportunities provided by organizational data, the firm must implement a data strategy that is consistent with their overall strategy and business model. For example, the firm John Deere recognized an opportunity to become a data-driven agritech platform, helping farmers with field management data analysis in addition to the required machinery. This successful transformation involved a significant change of their strategic priorities and a re-evaluation of their business model, preparing them for a more autonomous and efficient era of agriculture. Other great examples to explore are Rolls Royce and GE, two engine manufactures in the aerospace industry that have evolved from delivering and maintaining engines, to becoming a key partner for the airlines' daily operations. To increase the value delivered to their customers,

they now collect data from their operating engines in combination with a broad range of flight related data, to recommend changes in flight routes, flaps positioning, and other parameters, saving their customers billions of dollars in fuel costs alone. I have found these links useful:

- https://www.rolls-royce.com/media/press-releases/2020/10-02-2020-intelligen-tengine-introducing-yocova-a-new-digital-platform-designed.aspx
- https://d3.harvard.edu/platform-rctom/submission/ge-aviation-soar-ing-apart-from-competition-with-data-analytics/

These examples are some of many we discuss to illustrate how the use of data collected from products in use (also referred to as datagraphs) in combination with AI is leading to a new generation of business models and strategies that facilitate virtuous cycles for faster and better decision-making.

The course runs over three weeks during which we cover the following:

WEEK 1:

Our journey begins with an onboarding process where students are introduced to the course through online modules, readings, a virtual workshop, and a self-assessment to develop their foundational knowledge on what a data-driven organisation is. The online module also asks students to share their goals and expectations in relation to the course before we begin. We then have a first online session, where students get to know each other, and I set the context by introducing relevant trends related to digital technologies and their impact on organisations. In this session I introduce the paradigm of evidence-based practice, spreading from medicine to various disciplines including management, linking it to this course. I also provide various examples – from both digital-native firms and traditional industrial ones – that illustrate how and why the use of data is becoming a key differentiator between firms that are thriving and firms that are not. We then discuss in small groups some of the most common barriers to shift into a data-driven organization and some of the elements necessary to consider when developing a data strategy. This gets the students to reflect more about data strategy and data-driven decision making in their organization. For the remainder of the week the students complete an analytics capability assessment and a range of reading assignments to reflect on the importance of data and data culture, and to encourage all of them to see themselves as data scientists in the making.

WEEK 2:

Week 2 includes two online workshops. The first one involves a preparation and discussion of a case study describing GAP's decision to fire their creative directors and instead rely on data-driven design to improve their performance. Through this case we focus on the importance of understanding the problem and identifying assumptions before implementing solutions, as well as on the strengths and limitations of understanding customers' preferences through

data. This week's readings also cover how to manage a data science team and help them reflect on the importance of starting with small pilots before implementing a company wide solution. Further, students are shown a methodology to align analytics efforts with business goals and read a case study where the methodology was applied. Our second workshop of the week then focuses on applying this methodology to the case study on GAP, identifying how to assess and innovate an organizations business model to benefit from key leverage points for the deployment of analytics. This methodology proposes a few steps including examining the complex environment of the organization, mapping the business model, and identifying where analytics can create additional value. For example, if we were to consider an architecture firm in the built environment sector, this would involve taking a step back to examine their relationship with other stakeholders in the inception, design, and delivery of a building. This would include clients, suppliers, and engineering firms, but also more distal stakeholders such as suppliers of raw materials, occupants of buildings, or providers of digital tools for the design and management of the building. This step helps achieve three goals: first, students identify how their existing or future business model can create value within their complex environment and where opportunities lie to collect, store or share data to maximise that value; second, students identify and recognize the importance of establishing partnerships to collect valuable data from beyond their organisation that can inform decision-making; third, when applied to companies that design or manufacture products, this exercise highlights the importance for these firms to digitalise their products and infuse them with the capability to collect and communicate data. Once their organisational environment and the emerging opportunities are better understood, students then reconsider the firms business model and identify a number of data analytic efforts to prioritize as part of their data strategy. This step illustrates the importance of considering various elements that are often ignored when developing a data strategy, such as the organization's data assets, technological capabilities, organizational culture, and business strategy. A good example that illustrates how data strategy emerges from these co-evolving organizational factors is described by Vidgen, Shaw and Grant (2019). Finally, the workshop concludes by reviewing some important caveats when working with data such as confounding factors, sampling bias, and the Simpson's Paradox.

WEEK 3:

Our last week is focused on ethical issues that decision-makers need to consider when developing a data strategy and when making evidence-based decisions. This is a particularly important topic when collecting and using organizational data. We discuss data ethics, the data ethics canvas developed by de Open Data Institute, and several moral dilemmas that we can face when applying tools such as artificial intelligence to inform decision-making. A simulation developed by MIT moral machine involving self-driving cars having to make difficult decisions helps illustrate various moral dilemmas. We bring the last workshop to its

denouement by discussing the pros and cons of data driven decision-making in contrast with the limitations of intuition and expertise.

Overall, this three-week course involves several readings, online modules and workshops where students can share their insights and work with their peers. Instead of relying on quizzes and periodic assignments to assess and grade each student, I rely on class discussions, case studies and self-reflection exercises following each reading and online module. This prompts the student to reflect on the material and how it might apply to their own work environment. We conclude the course with a reflective essay as final assignment. This assignment is not graded as there are no right and wrong answers, but instead the aim is to prompt students to reflect on their initial goals, what they took away from the course, what they can change in their workplace, and how they can continue in their learning journey to facilitate more evidence-based decision-making.

Supporting Materials

Summary of content covered during the course:

WEEK 1

Introduction to the program – the imperative of becoming a data-driven organization
Goal setting for the program

Reading:
Why data culture matters - Díaz, A., Rowshankish, K., & Saleh, T. (2018). Why data culture matters. *McKinsey Quarterly*, *3*(1), 36-53.

Slide deck:
What is data; types of data; data as a source of competitive advantage; turning data into insights

Workshop 1:

- Changes in the landscape (Growth of data)
- Towards evidence-based management
- What is a data-driven organisation?
- Barriers and challenges to become a data driven organisation
- Elements of data strategy we need to consider
- How to measure our success in analytics initiatives

Self-assessment tasks:
The Analytics Capability Assessment Survey is used to determine your organisation's analytical capability. It is based on work by Richard Vidgen, Sarah Shaw, David B. Grant, 'Management challenges in creating value from business analytics', *European Journal of Operational Research*, Volume 261, Issue 2, 2017, Pages 626-639, ISSN 0377-2217, https://doi.org/10.1016/j.ejor.2017.02.023.

Readings:

- Top ten trends of data and analytics (Gartner) 2023 and 2024
- From analytics to artificial intelligence: Davenport, T. H. (2018). From analytics to artificial intelligence. *Journal of Business Analytics*, *1*(2), 73-80.

- TED video by Philip Evans: How data will transform business
- TED video by Kenneth Cukier: Big data is better data
- TED video by Rebecca Nugent: We're All Data Scientists

Optional: https://www.stateof.ai/

Forum discussions

Case study preparation: Harvard Case on 'Predicting Consumer Tastes with Big Data at Gap'

WEEK 2:

Workshop 2: Discuss Harvard Case:

- How do consumer preferences arise and evolve?
- What is the underlying problem?
- Data vs intuition/expertise
- GAPs overall fit between use of data and strategy

Reading:
Hindle, G. A., & Vidgen, R. (2018). Developing a business analytics methodology: A case study in the foodbank sector. European *Journal of Operational Research,* 268(3), 836-851.

- How organisations align analytics with business goals
- Action research to develop a BAM
- Why analytics should be driven by business modelling

HBR Article: Managing a data science team

Forum discussion

Workshop3: The application of the BAM methodology to the case 'Predicting Consumer Tastes with Big Data at Gap'.

- Painting a complex picture of the ecosystem
- Business model canvas
- Prioritising data analytics projects

WEEK 3

Digital experience:

- Leading a data-driven culture
- Data ethics
- The Data Ethics Canvas
- Moral decisions for machine intelligence

Reading: HBR article - How CEOs can lead a data-driven culture by T Davenport

Data Ethics Canvas: a tool developed by the **Open Data Institute (ODI)**.

TED video: The Ethical Dilemma of Self-Driving Cars by Patrick Lin

Task: MIT Moral Machine exercise

Exercise:

- Understanding types of data (e.g., personal data, sensitive data, anonymised data etc.)
- Sharing data
- Ethical and Legislative context

Workshop 4:

- Data ethics and using the data ethics canvas
- Review

Final assignment – reflecting on the course content

Recommended readings:

- Barends, E., & Rousseau, D. M. (2018). *Evidence-based management: How to use evidence to make better organizational decisions*. Kogan Page Publisher
- Govindarajan, V. & Venkatraman, V. (2024). *Fusion Strategy: How Real-Time Data and AI Will Power the Industrial Future.* Harvard Business Review Press

About the Author

Christian Criado-Perez is a researcher in Organisational Behaviour, specializing in evidence-based management and decision-making. He holds a PhD from UNSW Business School and degrees from IE Business School (MBA) and St. Louis University (B. Engineering). Christian built an extensive career working in the aerospace industry before transitioning to academia. He has co-authored various articles focusing on evidence-based management but also does research in other areas such as digital transformation, personality, and performance at work. Currently working at the UNSW Business School, Christian is a founding member of the Business Insights Institute – an initiative focused on building research partnerships with industry and policy-makers. In this role, he has led research projects and research grants with various stakeholders that have helped shape practice and policy. Christian also teaches at UNSW, where he delivers courses on data strategy and digital sustainability.

Developing Foundational Evidence Based Practice Competencies: Critical Thinking for Business Students: A First Year Undergraduate Module

Orla Feeney

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Developing Foundational Evidence Based Practice Competencies: Critical Thinking for Business Students: A First Year Undergraduate Module

Orla Feeney

Introduction

The ability to think clearly and rationally is the most defining characteristic of our species, ostensibly it is the reason behind our dominance of the planet. In fact, we can see how a lack of clear and rational thinking explains some of the climate related problems facing our planet right now. In this digital age misinformation floods our screens causing confusion, scepticism and inertia. An abundance of information with the appearance of legitimacy has led to a society which is becoming really bad at detecting falsehoods. If things appear glossy and legitimate we have begun to take them at face value. The complex social challenges resulting from this mean that the ability to think critically is not just a skill but a necessity.

Critical thinking is a foundational competency of evidence based practice (Sackett 2000). The basic idea of evidence-based practice is that good-quality decisions should be based on a combination of critical thinking and the best available evidence. Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, analyzing, evaluating, and synthesizing information as a guide to belief and action (Facione & Facione 2008, Profetto-McGrath 2005). It reflects the capacity for higher-order thinking, including reflection on one's own thinking and experience, evaluation of information, and hypothetical thinking about alternatives. Critical thinking imposes standards on one's thinking in order to

reduce bias and distortion and increase the completeness of available information. Thus, it is likely to aid the evidence based practice processes (Barends and Rousseau, 2021) of asking practice-related questions and problems in an answerable format and critically judging the trustworthiness and relevance of evidence.

This chapter sets out how Dublin City University Ireland's business school sought to cultivate critical thinking in its first-year students. By creating a collaborative and supportive learning environment amongst students and faculty. Our experience illustrates how educators can empower learners to manage uncertainty and vagueness and develop graduates who are creative and effective problem solvers.

Section 2 describes the module development project setting out how the key stakeholders guided the project's directions and decisions and aligned goals ultimately developing a successful module. Section 3 provides an overview of the module in terms of content, assessment and learning outcomes. Section 4 provides some student and staff reflections. Section 5 provides the results of a module pre and post test.

Developing the Module

Curriculum Review Project

The initial brief was to incorporate critical thinking into the curricula of all undergraduate business programs as part of a widespread curriculum review project. The business school offers seven undergraduate degree programs- Bachelor in Accounting & Finance; Bachelor in Business Studies; Bachelor in Business Studies International; Bachelor in Global Business, Bachelor in Aviation Management; Bachelor in Digital Business and Bachelor in Marketing, Innovation & Technology. A key objective of the project was to develop a common module which provided all students with a solid critical thinking base on which to build the core discipline content contained within their individual degrees.

Steering Group

An 'Evidence Based Management' steering group was formed, consisting initially of lecturers from the disciplines of Accounting, Economics, Organisational Psychology, HR, Management and Ethics. It was decided early in the project that including lecturers from diverse disciplines was essential, in both the creation and subsequent delivery of the module. Diverse academic backgrounds bring varied perspectives and methodologies which can only enrich the student experience. Students exposed to interdisciplinary approaches learn to evaluate problems from multiple angles, fostering a more holistic understanding of issues and problems. Lecturers from different disciplines, often implicitly, emphasise different critical thinking skills- an accounting lecturer might favour logical reasoning, an economics lecturer

might focus on empirical analysis while an organisational psychology lecturer emphasises creative problem solving. By integrating these diverse approaches into the development and delivery of the module, students develop a more versatile skill set, enhancing their ability to think critically across contexts, particularly in terms of their own individual degrees. This interdisciplinary collaboration prepares students to tackle complex, real-world issues with greater competence and adaptability.

We reviewed data detailing employers' expectations of graduates, current skill deficits in our student population, changing skill requirements in the marketplace as well as offerings from peer universities internationally. Through this process we identified a need to provide students with a more solid foundation in critical thinking, problem- solving and data evaluation skills as a foundation for their careers as evidence-based decision makers. Empirical evidence suggests that the best way to enhance critical thinking outcomes in students is to explicitly teach critical thinking skills (Soufi and See, 2019). This was the basis upon which we designed the module.

The first decision taken was to develop a module which would be delivered to all incoming first years, spanning the seven undergraduate business programs, capturing almost 700 students in total. Four of the initial members of the steering group formed the module's first teaching team.

Designing an Effective Module

The steering group started brainstorming key issues, concepts, antecedents, even deterrents to designing an effective module. Listed below are the items that arose frequently and provided some of the key parameters to module design;

Teach our students to be sceptical. Encourage students to interrogate information critically by seeking evidence and evaluating sources. Using up to date examples from media and public discourse we sought to design a module which developed their habits of enquiry and made them more discerning consumers of information.

Encourage our students to always ask 'where is the evidence?' We wanted students to avoid accepting statements at face value. This involved empowering them to make more informed decisions, almost giving them a sense of independence over the information they consume as opposed to just blindly following a narrative.

Critical Thinking Mindset. Acknowledging that critical thinking is more of an implicit mindset as opposed to an explicit skillset, we needed to consider what attributes our students should 'have' when they graduate as a result of studying this Critical Thinking module, i.e.open mindedness, logic, reflective,

curious. In this context we frequently asked ourselves the question 'can critical thinking be taught concluding that 'teaching' critical thinking involves guiding students in analysing arguments, evaluating evidence and approaching problems systematically and fairly.

Consider everything in the context of 'the future of work.' Equip graduates with skills to navigate complex problems in increasingly dynamic, technology driven work-environments. By fostering critical thinking we increase the potential for technology to enhance rather than detract from societal progress.

Reduce over-assessment at undergraduate level. Allow students to focus on deeper understanding as opposed to simply preparing for a test. We wanted to promote a meaningful and engaging educational experience which would lead to better long term retention and application of knowledge within their core discipline. Assessment should enhance engagement and consolidate learning as opposed to test knowledge.

Recognise resourcing challenges. With such a large cohort it was necessary to find creative ways to deliver the module 'effectively' utilising teaching assistants, doctoral students and masters students. Team-teaching was critical, spanning as many disciplines as possible. This helped with the workload of delivering a complex module to such a large volume of students, but more importantly adhered to the interdisciplinary approach which we decided was crucial to the module's success.

Utilising in house expertise. It was important that students met in as small groups as possible, as frequently as possible. Small groups encourage active participation, fosters diverse viewpoints and enhances collaborative problem solving. Workshop style sessions cultivated a supportive and safe learning community and allowed these first year students to improve their communication skills. This presented a challenge when dealing with a cohort of 700 students and necessitated close consultation with the business school's administration team who advised us that within the parameters of program timetables and room availability a group of this size could be accommodated in 30/35 student classes in 20 rooms per week- we resolved to incorporate as many of these sessions as resourcing would allow.

We also approached our university library and asked if they would be involved. The Business School librarian joined the Steering Group and quickly committed to joining our teaching team. Their brief was to put together a session with a working title of 'critical information selection' which upskills the students on library related research activities such as using academic databases etc.

> The Business School's learning technologist became a key part of our Steering Group. Our learning technologist works alongside faculty in the use and integration of technology to enhance teaching and learning. He attended all meetings, identifying where digital tools and resources such as online learning platforms, multimedia content and educational software could be incorporated. His role involved training faculty and advising on best practice such that any technological solutions utilized aligned with the pedagogical goals of the module. This was a crucial step forward in the project because as a group we did not sufficiently understand the potential of technology to support module delivery and assessment.

Having decided that assessment would be more focused on enhancing engagement and consolidating learning, we needed such assessment to be punctuated throughout the delivery. This would promote sustained engagement and reinforce key concepts. On-line solutions would be critical to making that manageable.

Learning Outcomes and Module Delivery

In the academic year 2019-2020 Critical Thinking for Business entered the first-year program structures for all programs in the school. Again, this amounted to 7 programs and almost 700 students. The objective of the module was to develop the critical thinking skills of our first-year undergraduate students. Particular emphasis was placed on evaluating and interpreting different types of information as well as supporting students in developing their critical reasoning and problem-solving abilities. The module ultimately set out 7 learning outcomes which reflect the 6 A's of evidence based practice (EBP) and the fours sources of evidence:

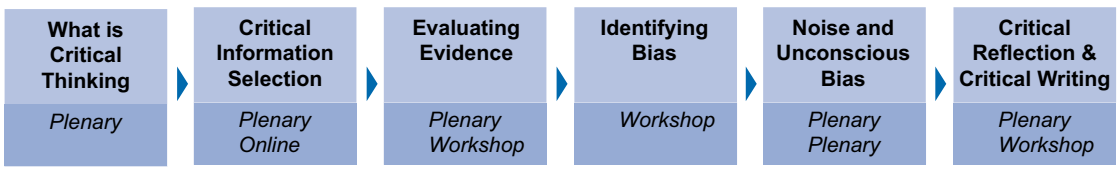
- **LO1:** Conduct reliable and effective library research, with a particular emphasis on electronic information sources, as well as use appropriate citing and referencing techniques. This learning outcome developed skills in the EBP step of Acquiring: systematically searching for and retrieving the evidence.
- **LO2:** Access and evaluate a wide range of information sources which can be used to inform the decision-making process. This learning outcome developed skills in the EBP steps of Acquiring: systematically searching for and retrieving the evidence, Appraising: critically judging the trustworthiness and relevance of the evidence and Aggregating: weighing and pulling together the evidence.
- **LO3:** Explore issues and make decisions using well researched facts, rules, concepts and ideas. This learning outcome developed skills in the EBP steps of Appraising: critically judging the trustworthiness and relevance of the evidence and Applying: incorporating the evidence into the decision-making process.

- **LO4:** Recognise the broader international, economic, societal and environmental contexts in which business is being conducted and decisions are being made. This learning outcome encouraged recognition of the various sources of evidence including stakeholders, professionals and organisations.
- **LO5:** Understand and recognise bias in a decision-making or problem-solving scenario and develop skills to counteract its negative impact. This learning outcome developed skills in the EBP steps of Appraising: critically judging the trustworthiness and relevance of the evidence and Applying: incorporating the evidence into the decision-making process.
- **LO6:** Think critically and logically when forming opinions and judgments. This learning outcome developed skills in the EBP steps of Appraising: critically judging the trustworthiness and relevance of the evidence and Applying: incorporating the evidence into the decision-making process.
- **LO7:** Combine insights from a broad range of disciplines and understand the importance of the weight of evidence in a decision-making situation. This learning outcome developed skills in the EBP steps of Appraising: critically judging the trustworthiness and relevance of the evidence, Aggregating: weighing and pulling together the evidence and Applying: incorporating the evidence into the decision-making process.

The mode of delivery had to be mapped out in parallel with the content and there was frequently a tension between the two. In designing content for a module of this nature it was important to 'dream big'- be open to ideas and avoid focusing on limitations and challenges. Mapping out the delivery was about operationalising the ideas in a way that was as true to the module design as possible, but within the confines of resourcing, timetabling and individual program course structures.

It was decided that the module would be delivered through a combination of plenaries (i.e. large lectures of approx. 250 students) and workshops (i.e. smaller classes of approx. 30 students), with each of the five components below, for the most part, having a combination of both. See Figure 1 for an overview of module delivery. The content of each section of the module is discussed in the next section.

Figure 1: Overview of Module Delivery



The plenaries provide context and content. They represent the 'tool kit', the things we want the students to remember. The learning is explicit. The workshops are the practical

experiential sessions during which the core skills are put into practice, primarily through the activities of the students (post first year, the workshops also incorporate some demonstration from faculty or outside contributors). The Steering Group believed that the small groups help to foster greater engagement so we endeavoured to prioritise as many workshops as possible.

Some blended learning is punctuated throughout, i.e. things students can engage with on their own, e.g. videos, mini assignments, on-line quizzes. In some cases, this provides a fore-shadowing for what's coming in the classroom, enabling students to prepare ahead of lectures with some pre-reading or an activity. The issues then get visited in class. Or it is used as a small piece of graded assessment after the session. This allows the students to take stock and establish what they've learned, but also allows the lecturer to identify where the student is at and what they've taken in.

Module Content & Delivery – Overview

The module opens with a plenary designed to encourage students to explore what they understand by the term critical thinking and how it manifests in their daily life, both in their studies and in the wider world. The session starts with the story of Stanislov Petrov, a lieutenant colonel in the soviet air defense forces who demonstrated incredible critical thinking to save the world from nuclear disaster during the cold war (Grimes, 2019). This is followed by some definitions of critical thinking from Cottrell (2023) as well as the Oxford English dictionary. We discuss examples of critical thinking, or the lack thereof, (i) in the mainstream media (i.e. we often site examples of media coverage of elections, wars and conflict, or something topical at the time such as sustainability or covid 19); (ii) in academia (i.e we talk about the very basic first steps of doing a literature search for an assignment in one of their other modules, mainly impressing upon them the importance of developing good habits in terms of literature search and the inevitable pitfalls of relying on google) and (iii) in business (we discuss some some relatable and well known business cases where critical thinking was clearly absent, e.g. Therenos, WeWork). This progresses into discussion about the importance of critical thinking and evidence based decision making in the workplace and what students can do now to develop these skills before they graduate. We site sources as varied as Socrates and the World Economic Forum in order to stress the importance of critical thinking.

The plenary goes on to explain how the module works in terms of delivery and assessment throughout the year. This is important. There is a slightly 'chaotic' nature to the delivery, from the students' point of view at least. That is entirely intentional. This is not like their traditional modules where they are in the same place, at the same time every week and the assessment is very clear cut and straight forward. As illustrated in Figure 1, sometimes they are in a large plenary, sometimes they are in a small workshop, sometimes they are working alone with material on-line. They are given very clear instructions on what to do and when to do it but ultimately they must take a little more responsibility for their learning then required of them in their more traditional discipline oriented modules. This is part of the learning of the module.

Five core skills were identified as important aspects of critical thinking to develop in students at this level, bearing in mind that they begin this module in their opening weeks of university.

1. Critical Information Selection

This component provides students with the tools with which to access the right information and in doing so to learn how to detect falsehoods, fallacies and fake news by validating information and citing sources. This section specifically addresses LO1, LO2 and LO3 above and the evidence based practices of Acquiring, Appraising, Aggregating and Applying. Most of the content is delivered in a plenary session by the Business School librarian. She starts by showing the students some information from wikipedia that is factually incorrect and explains how such factual inaccuracies make their way onto the internet. Students are then provided with examples of appropriate sources for the same topic- some academic, some non-academic- and it is explained why these sources are trustworthy and reliable. Students are then shown how to use the university's library resources to access such information. The motivation of this component is to help students to question source material, determine the validity or trustworthiness of a source and find best practice evidence. It was designed to support students in the competent discovery, selection and analysis of information. The librarian goes on to deliver training and provide access to on-line exercises on library databases and resources and teach students about the importance of supporting claims with appropriate sources and referencing. Supplementary material is provided via the university's own online library tutorials as well as some pre-recorded videos that students can return to whenever they need. The session is followed by an on-line quiz which examines the students' ability to negotiate the library resources, access information and validate data. This quiz comprises 15% of the module's marks.

A sample of the type of questions asked in the quiz are as follows:

> This is an incomplete Harvard reference for a journal article. What is missing?
> Munoko, I., Brown-Liburd, H.L. and Vasarhelyi, M., 2020. The ethical implications of using artificial intelligence in auditing. 167(2), pp.209-234.
> (a) The journals name
> (b) The publisher's name
> (c) The author's full first name.
> (d) The place of publication

When researching for a valid source of information to use in an academic essay, which of the following criteria is MOST important to ensure the reliability and credibility of the information?
(a) The publication date of the source
(b) The author's credentials and expertise in the subject matter
(c) The number of pages in the source
(d) The source's alignment with your pre-existing opinions

When using the library's search facilities to find academic sources for your research paper, which of the following steps is MOST effective in narrowing down your search results to the most relevant sources?
(a) Typing in a single, broad keyword related to your topic
(b) Using Boolean operators (AND, OR, NOT) to combine multiple keywords
(c) Selecting the first source that appears in the search results
(d) Filtering results by the publication year to get the most recent sources

Which of the following is the correct format for a book citation in Harvard referencing style?
(a) Smith, J., 2020. The Art of Research. New York: Academic Press..
(b) Smith, J. (2020) The Art of Research. New York: Academic Press.
(c) Smith, John. The Art of Research. Academic Press, 2020.
(d) J. Smith, 2020, The Art of Research, Academic Press, New York

2. Evaluating Evidence

Staying with LO1, LO2 and LO3, this section of the module starts with a plenary lecture which focuses on engaging with evidence and the exploration of issues using different types of evidence (e.g. eyewitness accounts, experiments, websites, news reports, analysts reports, books, journals, etc..). The lecture spends some time focusing on academic literature and students are given guidance on why and how to read academic papers. They are taken through the different sections of a paper before being introduced to the 'skim, scan and understand' reading strategy which helps them to become more efficient at identifying and comprehending relevant information from texts.

Skimming: Quickly looking over the text to get a general idea of the content.

Scanning: Searching through the text for specific information or keywords.

Understanding: Thoroughly reading and comprehending the selected relevant sections.

This plenary is then followed by a workshop in which the students meet their teams. They are given the brief for a team writing assignment which requires them to work together to prepare an overview of the challenges facing a company, together with a list of recommendations for addressing these challenges. This assignment is as much about getting the students to work together, listen to each other's views and complete the task as a group, as it is about the content of the piece. The assignment comprises 30% of the module's marks.

3. Identifying Bias

The identifying bias component is delivered in small workshops of 30 students. The workshops are designed to help students understand the range of biases that influence their perception of evidence and decision-making processes. It specifically deals with LO5 and the evidence based practice steps of Appraising and Applying. In advance of the small group workshops, students are required to complete a pre-workshop exercise worth 5% of their final mark. This exercise involved taking part in a global study of implicit bias run by Harvard University (https://implicit.harvard.edu/implicit/ireland/selectatest.jsp). Results from the study are collated, shared in the workshop and form the basis of an opening discussion about how we are unaware of many of the biases that influence us. Students are then introduced to a rational decision-making model (Robbins and Judge, 2021) designed to limit the influence of bias:

(1) Define the decision to be made: Clearly define the issue at hand.

(2) Identify the criteria necessary to judge different options:

(3) Weight the criteria (rank them in terms of importance to you)

(4) Generate a list of options/alternatives for your decision

(5) Rate each alternative on each of the criteria that you identified in step 2

(6) Compute and reflect briefly on the optimal decision

After the workshop students are asked to apply this process to a personal decision in an assignment worth 10% of their final mark.

4. Noise and Unconscious Bias

Focusing on LO4 and LO5 and the evidence based practice steps of Appraising and Applying, this component explains to students what is meant by noise and unconscious bias and how an understanding of these concepts is crucial for fostering critical thinking and ensuring objectivity, fairness, and inclusivity in various contexts including educational and professional settings. Students are introduced to the work of Kahneman (2011) which explores the two systems that drive the way we think: System 1, which is fast, intuitive, and emotional; and System 2, which is slower, more deliberate, and logical. Kahneman, a Nobel laureate in Economics, delves into cognitive biases, heuristics, and the ways these systems

interact, offering insights into decision-making, judgment, and human behavior. 'Noise' impacts almost all decision-making processes so we highlight the importance of recognizing and minimizing its effects so as to make informed judgments. Understanding unconscious bias helps students acknowledge and mitigate prejudices that can skew perceptions and affect interactions. Delivered in two large plenary lectures students are encouraged to develop heightened self-awareness, enabling them to approach situations with greater objectivity and empathy.

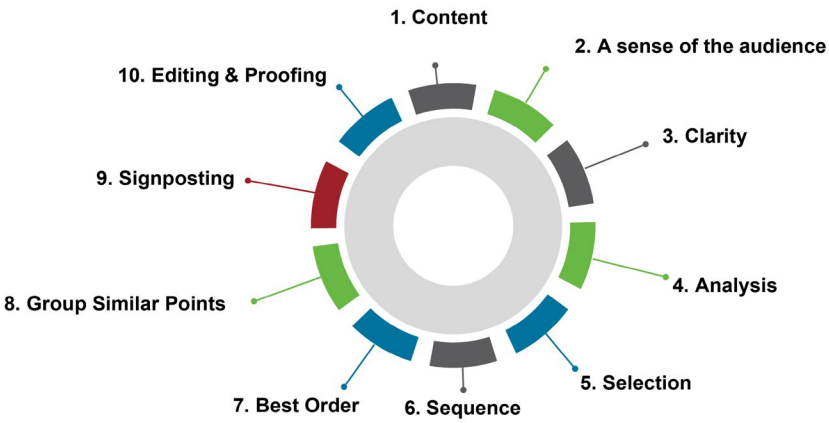
5. Critical Reflection & Critical Writing

As we approach the conclusion of the course we use the final plenary of the year to introduce the students to the '*What, So What, Now What*' critical reflection model first introduced by Borton (1970). We use this tool to reflect on each section of the entire module, simultaneously making explicit some of the key learning points of the course. This section revisits all of the LOs but specifically speaks to LO6 and LO7 and the evidence based practice steps of Appraising, Aggregating and Applying.

We go on to discuss critical writing, which is the medium in university through which many of these students will communicate the output of their critical thinking. This again allows us to revisit many of the crucial critical thinking issues which have arisen throughout the module, i.e. engaging with evidence, open minded and objective enquiry, recognising the limitations of evidence, respectful discourse. Again, the focus of this plenary is on writing, but it allows us to revisit some of the foundations of critical thinking that were dealt with throughout the year. i.e. students should not accept the conclusions of others without evaluating their argument and evidence and they must analyse information in order to understand a problem or issue from more than one perspective.

The lecture goes on to review some specific 'critical writing' guidance from chapter 10 of Cottrell (2023), specifically the structure of a critical essay as well as the characteristics of critical, analytical writing (See figure 2).

Figure 2: Key Characteristics of Critical Writing



After this plenary, the students attend a workshop of 30 people or less, participating in an exercise in which we discuss evidence. Students are split into small groups and given a topic (e.g. climate change, healthcare). We ask them to imagine that it is ten years time and we have successfully addressed the challenges of climate change, or we have successfully reformed healthcare. The groups must come up with examples of evidence they would need to see in ten years time in order to convince them that this had happened, or indeed not happened. We then have a discussion about what is evidence, as distinct from opinions or assertions. We tease out where we might find some of that evidence and evaluate the quality of different types of evidence in the context of the exercise. It is generally a lively discussion. Together we will access some of this evidence in the class (e.g. academic papers, Central Statistics Office information, government or European Union publications) and follow through with an illustration of how you would cite and reference this evidence in an essay.

This exercise prepares them for their final capstone assignment in which students are asked to select from one of ten topics and write a critical essay which explores the issue through a reasoned evaluation of the evidence. These topics focus on issues where there are multiple perspectives. Their essays must demonstrate their awareness of those different perspectives and why they have arisen, requiring them to critically evaluate the evidence base for the contrasting viewpoints before drawing together their own critical judgement to form a conclusion. Essentially, we are asking them to utilise the critical thinking toolkit they had developed over the course of the module. The essay comprises 40% of the module. Topics which have been used in the past include:

- Video games cause aggressive behaviour: Fact or Myth? Discuss the ongoing debate surrounding the impact of video games on aggression among young adults.
- Would gender quotas in the Irish parliament improve Irish democracy?
- Critically discuss the issue of transgender women competing in female categories in sports.
- 'Rural Ireland is being left behind in the race for urban excellence'. Discuss
- Should social media be regulated? If so to what extent.
- Influencer Marketing is Manipulative : Critically assess the relevance and impact of influencer marketing.
- Should Chat GPT be allowed to write your essay? Discuss the role of AI in higher education?
- Universal Basic Income: government handout or human right?

Students are taken through the grading rubric in the workshop so they know exactly what is expected of them. The exercise of going through the rubric is intended to give students insights and guidance into what we are looking for in this assignment specifically, but also college assignments more generally. Practical advice is offered on basics such as 'addressing the brief', 'adhering to assignment instructions' and 'proof-reading'. The assignment specifications (Appendix 1) and marking rubric (Appendix 2) are provided at the end of this chapter.

Assessment - Overview

There was widespread agreement that we didn't wish to over-assess this module. It took some time to think about what we want the students to learn in this module and how to reflect this in some form of meaningful assessment.

Assessment is very important for the lecturing team as a tool to see 'are they getting it'. The small pieces of assessment dotted throughout the module provide milestones and checkpoints where the teaching team can ascertain what the students are getting from it.

> ***Critical Information Selection*** [LO1, LO2 and LO3] – 15% online quiz examining usage of library resources, databases, referencing, citing etc.
>
> ***Evaluating Evidence*** [LO1, LO2 and LO3] – 30% group writing project examining a critical and current area drawing on a range of information sources.
>
> ***Identifying Bias*** [LO5] – 5% pre test in advance of Identifying Bias workshop plus 10% written post-test after workshop.
>
> ***Critical Reflection & Critical Writing*** [LO4, LO6 and LO7] – 40% Capstone assignment incorporating all aspects of the module.

Student and Staff Reflections

Student Feedback

A survey was conducted after the first delivery in order to gain insight into the student experience. It received 546 responses. Using a 1-5 scale of satisfaction (with 5 being the highest), 63% of students were satisfied or very satisfied with the vast majority of the remaining students reporting moderate satisfaction.

With over 500 responses, the following is only a small sample of the feedback received but is indicative of student sentiment:

- *"The critical thinking module pushes students to evaluate information presented to us. I found the information and skills I learnt in this module I can use and improve on moving forward. I liked that we were taught life skills that I can use in the future."*
- *"I liked the range and scope of the individual segments in this module as they were interesting and engaging. I felt they provided a great insight into the benefits of being able to think critically and that the in class assignments were incredibly helpful at getting me to think critically about the information provided."*

- *"I don't think I could have made the leap to third level without learning how to critically evaluate information."*
- *"I enjoyed the way there were different lecturers teaching different aspects of the module and how every couple of weeks we were focusing on something different."*
- *"I liked learning how to be able to find data that backs up my previous assumptions while also being fair and looking at data that disproves my previous assumptions."*
- *"I thoroughly enjoyed this whole module. I found how engaged all of the lecturers were with the content to be really amazing. They seemed passionate and their slides and advice helped me with my assignments."*
- *"I enjoyed the identifying bias section of this module also. I was very surprised with the results and this has helped me to question things more without relying on preconceived ideas and biases."*
- *"I liked writing the abstract for the article as it gave me a better understanding of what an abstract was and I was able to learn how to efficiently summarise an academic text."*
- *"All lectures presented remained positive and outgoing throughout all lectures and kept the coursework involving and interesting for all students with a positive attitude. Made the module enjoyable to attend and worthwhile."*
- *"It taught me essential knowledge for DCU I wouldn't know, like using the library online."*
- *"Assessments were well spaced out across year and away from exams lightening the workload."*
- *"I love that this module was very relevant and it prepared me for the business world."*
- *"This was a fantastic module to get started into dcu. I found this module gave me an insight into the expertise of the dcu lecturers and getting to know the lecturers in the DCU."*
- *"I feel the module has really helped us get our bearings in terms of adjusting our approach to academic work, it helped us make the switch from the Leaving Cert mindset to a more third-level approach. This helped not only for assignments relevant to this module but also every other module this year."*
- *"I also appreciated that the assignments given were extremely relevant to the lectures and workshops, this sounds like a given but often is not. The assignments were clear and we were given an abundance of guidance which was extremely helpful. They were challenging and thought-provoking yet not stressful or overwhelming in times when the course load was particularly heavy."*

- *"Although I am already quite a critical thinker, this module has definitely taught skills that will stick with me throughout my time in college and in my future career. It was one of our more enjoyable modules in first year AF."*
- *"It broadened my horizons to make me think differently - Showed me how to identify bias through a number of different means - Has helped me with writing in college as you have to be able to think on a higher level for yourself."*
- *"The way the module made me open my eyes to the fact everything you see or hear might not be true. The informative nature of the module. The way this module can help a lot with other modules."*
- *"It gave me a different perspective on how to compose essays in the sense of evaluating both sides of an argument and attempting to be unbiased while putting my views across. It gave me a sense of how to manage everyday situations and looking at my own flaws instead of blaming others. It encouraged me to reflect more on everyday life."*
- *"It was the only module that I feel is trying to give an education rather than just learning to test this was a nice change of pace and something I haven't experienced before."*
- *"It was definitely one of my favourite modules, the interaction between students and lecturers was refreshing, the variety of lecturers and tasks kept me engaged. I could feel the skills I was learning from this module being applied to other projects and assignments I was undertaking."*
- *"I don't think there is much room for improvement in this module, it was potentially one of if not my favourite over the two semesters."*

Staff Reflections

- *The team found this to be an enjoyable module to teach and from interactions with students and the above survey, we are of the view that this has been a very successful initiative. Refinements are made on a continuous basis but, on the whole, the module has been well received and has met the objective of providing a foundation for critical thinking skills in our students at an early stage. It was clear from their engagement in the module and feedback that students were able to identify the relevance of these skills both in the short term to their college and personal lives but also in the longer term to their careers in industry. We believe that this success should be built on and the momentum and insights generated in first year used to develop a second year module. The survey tells us that students would like to build on first year with more in-depth and technical exploration of these issues and further application of the ideas via case studies and guest speakers from industry. This continued*

and increasing level of application to real world business problems along with a potential integration with Intra assignments would provide a strong basis for the longer term development and use of evidence based decision making which we believe should be a hallmark of a DCU Business School graduate.

Module Pre and Post Test Results

Triggered by a faculty members question as to how we would know if this module developed the suggested critical thinking skills in students, we designed, using material from the Centre for Evidence Based Management (see Appendix 3) a pilot pre and post test instrument which was distributed via the programme LOOP page to all students in week 1 of the programme and post module completion. The pre-post test results identified a statistically significant difference between the scores of students on the critical thinking module pre taking the module (Mean 5.92) by comparison to after completing the module (Mean 6.25) in a sample of 516 students.

References

Borton, T. (1970). *Reach, touch and teach*. London:Hutchinson.

Barends, E., & Rousseau, D. M. (2021). *Evidence-Based Management: How to use evidence to make better organizational decisions*. Kogan Page.

Cottrell, S. (2023). *Critical thinking skills: Effective analysis, argument and reflection*. United Kingdom: Bloomsbury Publishing.

El Soufi, N., & See, B. H. (2019). Does explicit teaching of critical thinking improve critical thinking skills of English language learners in higher education? A critical review of causal evidence. *Studies in Educational Evaluation*, *60*, 140-162.

Facione N. C., & Facione P. A. (2008). *Critical thinking and clinical judgment in the health sciences—An international teaching anthology*. Millbrae, CA: Calif. Acad.

Grimes, D. R. (2020). *The Irrational Ape: Why flawed logic puts us all at risk, and how critical thinking case save the world*. United Kingdom, Simon & Schuster, 2020.

Kahneman, D. (2011). *Thinking, fast and slow*. United Kingdom: Penguin.

Profetto-McGrath, J. (2005). Critical thinking and evidence-based practice. *Journal of Professional Nursing*, *21*(6), 364–371.

Robbins, S., & Judge, T. (2021). *Essentials of organisational behaviour* (15th ed.). New York: Pearson.

Sackett, D. L. (2000). *Evidence-based medicine*. New York: Wiley

About the Author

Orla Feeney teaches in the areas of accounting, critical thinking and research methods and methodology. Her research focuses on the exploration of accounting as a social phenomenon within organisations, with a particular focus on strong structuration theory as a theoretical lens. She is particularly interested in the impact of digital technology on accounting and the future of accounting and accounting education in a changing business landscape.

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Author Note

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Appendix 1

Critical Thinking for Business

Semester 2 - Final Assignment

Please select one of the topics below and write a critical essay which explores the issue through a reasoned evaluation of the evidence. These topics focus on issues where there are multiple perspectives. Your essay should demonstrate your awareness of those different perspectives and why they have arisen. You should critically evaluate the evidence base for these contrasting viewpoints before drawing together your own critical judgement to form a conclusion. This piece of work should be in the range of 1,000-1,200 words (excluding the bibliography list at the end). You must not exceed 1,200 words.

Your essay must include a consideration of the unconscious bias and/or noise in this subject matter. Demonstrate your understanding of these concepts and how you navigated it in your consideration of the topic.

Your essay must include consideration of some peer reviewed academic literature.

This assignment is worth 40% of the module's marks. It should be submitted via Loop. Final submission will be subject to an Urkund check on Loop. You will be permitted to run the Urkund check yourself prior to final submission. Submissions must be in Word format only and the filename must include your name.

Things to Note

- Submit in *Calibri* or *Times New Roman*, font size 12, 1.5 line spacing, justify your text in word and ensure the piece is fully proofed for grammar, spelling, syntax and referencing.
- You can only submit word documents in doc or docx
- Use Harvard referencing.
- Utilise the Critical Thinking toolkit you have been developing throughout this module with regard to information selection, reading academic and non-academic literature, bias, critical reflection and writing.
- A small sample of students will be randomly selected to come in for a short Q&A on their essay. The Q&A will centre on process, how the research was conducted etc…

Submission Deadline - Students must submit on loop by XXX

Appendix 2

Grading Rubric for Final Writing Assignment

INTRODUCTION	**0** There is no clear introduction.	**5** The introduction states the main topic OR sets out the structure of the paper but it does not do both and does not particularly compel the reader to keep reading.	**10** The introduction sets out the main topic AND sets out the structure of the paper but does not particularly compel the reader to keep reading.	**15** The introduction sets out the main topic AND sets out the structure of the paper and compels the reader to continue reading.
STRUCTURE	**0** There is no structure, the piece is poorly planned and illogically presented.	**5** The piece does have a structure but it is somewhat fragmented and lacks flow.	**10** Good paragraph structure and flow but the key points and overall message of the piece lack some clarity.	**15** Excellent structure and flow from paragraph to paragraph. The main reasons and key points stand out clearly to the reader.
EVIDENCE	**0** Little or no evidence is provided. There is too much non-essential descriptive writing.	**5** The writer provides some evidence, but it is disjointed and/or weighted on one side of the argument.	**10** Evidence is well selected and balanced, clearly linked to one and other and to the conclusion.	**15** The writer makes excellent use of a variety of facts, information and research, including those that contradict his or her own point of view, as compelling evidence to strengthen their argument.
CRITICAL ANALYSIS	**0** The writers own beliefs or self-interests dominate the piece, these are presented as facts without supporting evidence. Lacks any form of analysis or evaluation.	**5** There is some surface level analysis of the issue but it is predominantly descriptive and provides only minimal evidence in support of any point made.	**10** Moderate level of analysis. Presents some evidence but does not apply this effectively to evaluate the overall claim/issue. Understands the importance of evidence but provides account of the evidence rather than using it to reach an informed conclusion.	**15** Clear identification of the issue and identifies the main claims made in comparable and contrasting sources. Excellent use of research based evidence in support of arguments and evaluation that reach a solid conclusion.

IDENTIFY UNCONSCIOUS BIAS AND OR NOISE IN THIS SUBJECT MATTER & DEMONSTRATE UNDERSTANDING OF THESE CONCEPTS.	**0** Application of knowledge in relevant context contains major errors and or omissions.	**5** Basic grasp of how these concepts relate with the subject matter, but with several lapses therefore showing limited understanding of these concepts.	**10** Broad detailed knowledge of the concepts and how they relate to the subject matter. Demonstrates a good level of understanding of these concepts.	**15** Exemplary application of knowledge in relevant context. Outstanding use of creative examples are used to support the argument.
CONCLUSION	**0** There is no clear conclusion.	**5** The conclusion is not fully developed or convincing and does not synthesise the main points well.	**10** It draws together the main points of the piece but does not offer a particularly convincing conclusion.	**15** It draws together the main points of the piece very well. The writer's conclusion is clear and based on a reasoned evaluation of the evidence.
PRESENTATION	**0** There are some spelling, grammar, syntax and punctuation errors and the piece is poorly written and referenced poorly.		**10** There are very few, if any, spelling or grammatical errors, good punctuation and syntax and the piece is well written and appropriately referenced.	**15** There are no spelling or grammatical errors, good punctuation and syntax. The piece is extremely well written, polished and cleverly presented with perfect referencing.

Appendix 3

Pre-Post Test Instrucment

1. How would you define critical thinking? (*Select one or more*)
   a. The process by which one acquires knowledge through experience, thought and sensory input.
   b. The capacity to be aware of, control, and express one's emotions, and to handle interpersonal relationships judiciously and empathetically.
   c. The objective analysis of an issue and the data, facts and evidence relating to it.
   d. The ability to think clearly and rationally, understanding the logical connection between the different components of a decision or a problem.
2. Why do we need critical thinking in business? *(Select one or more*)
   a. The process by which one acquires knowledge through a. So we can influence people.
   b. So we can recognise falsehoods in evidence presented to us.
   c. So we can recognise flawed reasoning.
   d. So we can criticise more effectively.
3. Why do students need to use critical thinking? (*Select one or more*)
   a. So we can understand how verbal and nonverbal behaviours are implicated in our interpersonal interactions.
   b. So we can identify and manage our emotions and the emotions of others.
   c. So we can evaluate the strength of the evidence to support different arguments.
   d. So we can enhance our 'perspective taking' skills when engaging with fellow students.
4. Critical evaluation means identifying only negative aspects when making an analysis. (*Select one*)
   a. True
   b. False
5. Research conducted by a top university professor published in a top academic journal does not need to be critically evaluated. (*Select one*)
   a. True
   b. False

6. Imagine you are preparing for your first year exams. Would you regard the following statement from a lecturer as evidence of how to perform well in exams? (*Select one*)

   "In the 15 years I have worked as a lecturer I have noticed students are more likely to perform well in exams if they have attended lectures."

   a. Yes
   b. No

7. According to DCU's Professor of Enterprise & Innovation, 50% of new businesses fail in their first year. Would you regard this as evidence? (*Select one*)

   a. Yes
   b. No

8. Imagine you are completing an essay for your HR101 module on Motivating Employees. Would you regard an Irish Times article written by a top CEO reflecting on her experiences of motivating people as evidence? (*Select one*)

   a. Yes
   b. No

9. Read the following abstract of an empirical study entitled "The effect of early entrepreneurship education"

   The aim of this study is to analyse the effectiveness of early entrepreneurship education. To this end, we evaluate a leading entrepreneurship education program that is taught worldwide in the final grade of primary school. We focus on pupils' development of entrepreneurship knowledge and a set of non-cognitive skills relevant for entrepreneurial activity.

   The study was conducted between February and July in 2010, and again during the same period in 2011. In total 120 schools participated in the study. Random assignment to the treatment or control group took place at the class level. Classes assigned to the control group were excluded from participating in the education program.

   To gather data for determining the effect of the education program, all pupils had to complete two extensive questionnaires, measuring entrepreneurial knowledge and non-cognitive entrepreneurial skills. The questionnaires were sent to all 120 schools in February 2010, before the education program started. The second questionnaire was sent out to both treatment and control classes in July 2010, after the education program ended. The results indicate that knowledge is unaffected by the program. However, the program has a robust positive effect on non-cognitive entrepreneurial skills.

What is this study's research question? (*Select one*)

a. Evaluate a leading entrepreneurship program.
b. How does early entrepreneurship education affect non-cognitive entrepreneurial skills.
c. Can final grade primary school pupils learn to be entrepreneurs.
d. Jurisdictional differences in early entrepreneurship education.

10. Read the following results from a study entitled "The Relationship Between Employee Engagement and employee turnover: A Meta-Analysis":

    Based on 521 cross-sectional studies with a total sample size of 9,939 business units and 23,567 employees, this meta-analysis examined the relationship at the business-unit level between employee engagement and turnover. We found a significant correlation between overall engagement and business-unit turnover.

    What conclusion(s) can be drawn based on these findings? (*Select one or more*)

    a. The findings indicate that a higher level of employee engagement leads to a lower turnover.
    b. The findings indicate there is a weak relationship between employee satisfaction and turnover.
    c. It is unclear whether a higher level of employee engagement leads to a lower turnover.
    d. Given the large number of studies a causal relation between employee satisfaction and performance is likely.
    e. The findings suggest there is no causal relation between employee satisfaction and performance.

11. Determine which of the following journals are peer reviewed by looking up their information page in the A-Z Journals Database. (*Select Yes or No*)

    a. Strategic Management Journal
    b. Harvard Business Review
    c. Accountancy Ireland
    d. Employee Relations

12. In 2017, Deloitte published a report focusing on key competencies in the digital age. On page 29, you will find Figure 11. illustrating the future importance of skills.

    Rank the proportion of jobs as a percentage of total employment for which the following skills will be important in 2030:

    a. Critical thinking
    b. Active Listening
    c. Judgement and Decision Making
    d. Active Learning

13. Which of the following statements regarding peer-reviewed journals are correct. (*Select one or more*)

    a. Research articles published in peer reviewed journals are evaluated and critiqued by independent, anonymous scientists in the same field.
    b. The process of peer review ensures that a research article is valid and reliable.
    c. A research article published in a peer reviewed journal with a high impact factor does not need to be critically appraised.
    d. Peer review gives you some assurance that a research article is not seriously flawed.

14. Imagine you are trying to get fit. You are thinking about downloading Nike's fitness tracker app. Would you consider as evidence the outcome of a Nike survey that indicates that most people find it easier to get fit when using a fitness app? (*Select one*)

    a. Yes
    b. No

15. Over a 5-year period, whose professional expertise would you judge to be most valid and reliable? Check all that apply. (Select one or more)

    a. An eye surgeon specializing in eye laser surgery.
    b. A management consultant specializing in culture change.
    c. A car salesman specialized in selling second hand cars.

Capstone Projects Integrating Multiple Sources of Evidence

Ann Smith and Alessandra Capezio

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Capstone Projects Integrating Multiple Sources of Evidence

Ann Smith and Alessandra Capezio

At the Australian National University we teach Evidence-Based Management (EBM) through an integrated curriculum approach across multiple programs. These include undergraduate programs as well as Masters of Business Administration (MBA) programs and our Graduate Certificate of Management and Masters programs at the postgraduate level. These offerings attract very different cohorts of students. Their work experience and management experience vary and their expectations of their study are equally varied. This chapter explains how we address differing capabilities and needs of students as we guide them to develop an EBM report on a practice topic. We offer our approach to show educators how to use a practical project to build EBM capabilities through a capstone project that acquires and synthesises several sources of evidence relevant to a practical problem.

A capstone course facilitates assessment of EBM-related competencies. It provides opportunities to draw on multiple sources of evidence and assess their trustworthiness according to relevant criteria. These features of evidence-based practice draw on the six functional capabilities (Figure 1) contributing to evidence-based decision-making in management. In so doing it also provides opportunities for students to develop the four core capabilities as well (Figure 1). A capstone project helps students demonstrate their capacity to integrate these functions effectively.

Figure 1: The 4 Core and 6 Functional Capabilities of Evidence-based Practice in Management, Illustrated in Relation to the 4 Sources of Evidence Recognised by EBM.

We describe two EBM-related capstone projects. One is a program-level capstone project for executives in a small-scale MBA program. The other is a course-level capstone project for a large mixed cohort of 120-360 pre-experience and post-experience students in a postgraduate course in evidence-based management.

Program-Level Capstone

The MBA Capstone

Within our MBA program, students take a course on evidence-based management in their first semester. They are subsequently re-exposed to the key principles across other courses. Finally, they complete a capstone EBM course to demonstrate their learning.

The capstone project reflects a complex management problem or topic. This program includes a wide range of management topics but the curriculum offers no electives. The program-level capstone enables all students to draw on and integrate the diverse disciplines they have studied. Some of the topics proposed by students focus on workflow or achievement of business outcomes in students' work areas. Examples include problems with decentralised network models in service delivery, the impact of employee behaviour on data breaches, and the effect of bankruptcy term on entrepreneurial activity. However, most problems or topics focus on organisational behaviour at individual or group levels, particularly leadership or team management issues. Examples include turnover problems in the student's work area, employee reactions to change, impact of workplace incivility observed by the student, poor leadership, and impact of mergers on public servants' morale.

Design

The capstone is an individual project undertaken over a 14-week semester class (Figure 2). There are two forms that the final submission is likely to take. The most common form is a proposal for an intervention or innovation in the student's organisation. This form results in recommendations for change to business or management processes. Less common is the second of the likely forms, which is a consultation project within the student's organisation or a client's organisation. This form results in a report about the student's experience and findings from consulting on their selected topic. Other kinds of projects are considered in the rare case the student seeks another option.

Figure 2: MBA capstone schedule

WEEK	EVENT	NOTES
1	First seminar: Methods	
2	Second seminar: Methods First consultation: selection of topic	Students are expected to book 1-3 more consultations with the instructor any time during Weeks 3-12.
3-4		
5	Submission: Problem statement.	
6	Instructor feedback provided in writing	
7	Mid-semester break.	• Students are expected to continue researching their capstone project during the two-week break. • Consultation is available but there is no formal teaching offered during the break.
8		
9	Third seminar: presentations of problem statement (in-class). Peer feedback during seminar.	
10-13		
14	Submission: Capstone project presentation (in-class)	
Post-Semester	Submission: Capstone project report. Submission: Self-reflective review.	The final submission is due one week after the semester ends.

Topic

Students develop their own topic in consultation with the instructor. There are two common mistakes that can arise from a student's initial proposal. One mistake is that students initially present a proposed intervention as a problem. For example, they may propose to investigate ways to increase job satisfaction in their workplace. Questioning will reveal that the actual problem is something else—perhaps high turnover—and job satisfaction may not even be relevant to the problem. The other common mistake is that they present a single case as a management problem. For example, one student proposed investigating ways of removing a particular low-performing staff-member, even though the organisation had performance management processes in place to manage such cases. In both scenarios the instructor guides them to develop a more refined understanding of the situation or assists them to identify a more appropriate topic.

In all cases the choice of topic or problem must be approved by the instructor. Instructor approval ensures that the scope of the topic allows the capstone to function as a vehicle for assessment. There are multiple factors constraining the scope. One is the need to be completed within a 14-week semester. A second factor is the need to test all learning outcomes associated with the MBA program. A third factor is the availability of literature—that is, a reasonably large research literature for the student to search and identify relevant findings. The fourth factor is a topic of interest to the student. If their topic is related to their workplace then it is likely to keep their attention. It may also be possible for them to take their proposal back to their workplace for implementation. If so, then the student will be even more engaged, to ensure that their proposal is indeed fit for purpose and will reflect well on them.

Guidance for Students

Students are given guidance on their capstone project throughout the semester through seminars, consultation, and feedback. They learn about the practice of business research to understand the requirements of the capstone project. They also receive feedback on their progress, helping the instructor provide guidance where needed.

Seminars

Students attend three seminars led by the instructor. In these seminars students explore the interrelationships among problem definitions, research questions, sources of evidence, and research methods. These learnings are mediated by peer-based learning as well as direct instruction. There is also some procedural guidance given on report writing and capstone structure. The seminars are spaced widely. In Weeks 1 and 2 the seminars ensure that the students understand how to commence their project. Then in Week 9, halfway through, students provide peer feedback, enabling them to both give and receive feedback. This seminar provides an opportunity for the instructor to monitor the students' progress.

Consultation

Students are expected to consult individually with the instructor 2-4 times. These consultations enable the instructor to monitor individual student's progress, giving guidance in between the spaced seminars. The students' first consultation will take place during Weeks 1-2, as it will be focused on negotiating their topic. Students may also consult with the instructor at any time during Weeks 3-14. These later consultations are focused on providing the student with feedback and guidance on problems they may encounter. Accordingly, the timing of subsequent consultations is at the student's discretion.

Feedback

Students submit a problem statement by the end of Week 5 of the course. This timing is important. It is far enough through the course that the students have had time to conceptualise their problem. It is also early enough for remedial guidance to be given if required. This submission provides marking and feedback to the student. It enables the instructor to monitor progress on the topic. It also permits the instructor to monitor the students' structuring of the elements of the submission.

Assessment

In the final week (Week 14) the cohort reconvenes for oral presentations of their work. The students have up to 30 minutes for their presentation. They then take questions and defend their proposal to both the instructor and other students for no more than 20 minutes. The presentation and defense are weighted at 5% each. Students also reflect on their learning over the course of their MBA education through a 1000-word reflection, weighted at 30% of the total mark.

The student's study is completed with the submission of their project report, weighted at 60% of the total mark. This is a document of 3500-5000 words in a structured format based on business report standards while using academic levels of citation and referencing (Figure 3). Students are encouraged to incorporate feedback they received during their oral presentation into their final submission.

Figure 3: Rubric for the Program-level Capstone Submission

SECTION	CRITERIA	MARKS
1. Executive Summary	• Clearly and concisely describes the problem, methodology, **key findings, and recommendations.**	5%
2. Problem Identification	• Describes assumed problem opportunity or claim, including assumed organisational consequences and causes. • Clearly describes the organisational context. • Rationale – why it is a problem. • Tests the assumed problem/claim and preferred solutions briefly against at least 2 different sources of evidence: i. Stakeholders ii. Professionals iii. Organisational evidence iv. scientific findings • Clearly articulates a valid overarching research question (mapped problem to right scientific construct).	15%
3. Methodology	• Clearly describes the process of arriving to evidence-based solutions to the problem/opportunity. • Clearly describes what research methods were used and which sources of evidence were acquired to identify the problem and solutions.	10%
4. Findings from other sources of evidence	• Clearly presents stakeholder or professional preferred solutions.	

SECTION	CRITERIA	MARKS
5. Critically Appraised Topic (CAT) and findings from the science	STEP 1 - Clear and concise problem statement STEP 2 - Clear, focused and answerable CAT question and sub-questions (s) and review objective(s). *questions are different from overarching research question as focused on what is known in scientific literature only. STEP 3- Clearly explains criteria for including and excluding studies. STEP 4- Provides a clear explanation of how the search was conducted and which databases and search terms were used. STEP 5- Provides a clear explanation of how studies were selected or screened to meet inclusion criteria. STEP 6- Provides a clear explanation of what information was extracted from each study to address the CAT question(s). STEP 7- Presents sufficient critical appraisal of methodological appropriateness and appropriately referenced details presented for each of the studies included in a table. STEP 8- Ensures main findings of the review reflect what is known in relation to the CAT question(s). STEP9- States and explains each finding clearly and precisely in one sentence. STEP 10- Outlines limitations of the CAT and practical implications of the findings clearly.	20%
6. Aggregation of findings	• Systematically integrate the different sources of evidence and consider the limitations of each source of evidence.	5%
7. Evidence-Based Recommendations	• Clearly describes enumerated recommendations for practice.	9%

SECTION	CRITERIA	MARKS
8. Evidence Translation and Implementation Plan	• Clearly identifies important supportive conditions for implementation success. • Shows Clear implementation plan. • Includes Logic model diagram. • Considers Evidence-based principles for change. • Includes valid evaluation criteria to assess the impact of interventions. • Includes easily interpreted and clearly presented outputs or artefacts (For example frameworks, models, decision-aids, logic models, validated measures).	15%
9. References	• Sources used are adequately and accurately referenced throughout the CAT. • The reference list is presented accurately and appropriately and as per the system of reference (Harvard or APA) used.	2%
10. Appendices	• Appendices presented accurately and appropriately a. Stakeholder and professional questionnaires b. Stakeholder and professional interview schedules c. CAT appendices (refer to CEBMa guidelines) d. Search terms e. Selection of studies f. Data extraction g. Excluded studies	2%
11. Overall Presentation	• Overall presentation (structure and flow) satisfactory.	2%
TOTAL		**100%**

The capstone report integrates multiple forms of evidence. The capstone project is required to draw on evidence from scientific research. A Critically Appraised Topic (CAT) is a formalised method of documenting the acquisition and appraisal of scientific research submission (Barends, Rousseau & Briner, 2017). Accordingly a CAT is a key element of the capstone. The capstone project is also required to draw on the other three evidence sources of EBM (Figure 1). Documentation of the acquisition, appraisal and findings of evidence

from organisational sources, professional practitioners and stakeholders is also required. The submission is intended to be a 'business-ready' proposal. It includes timelines for implementation and assessment of the proposed intervention. Taken together, the submission integrates and assesses executive student's attainment of the core and functional capabilities of evidence-based practice in management (Figure 4).

Figure 4. Mapping of the Assessment Structure of the Program-level Capstone to the Core and Functional EBM Capabilities

SUBMISSION:	**PROJECT REPORT**								**REFLECTION**
SECTION: ***CAPABILITY:***	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
ASK		X							
ACQUIRE		X	X				X	X	
APPRAISE			X					X	
AGGREGATE		X		X					
APPLY					X	X			
ASSESS						X			
Leadership, Change and Stewardship	X				X				X
Knowledge generation and translation		X	X			X			X
Critical and analytical skills		X		X		X			X

Outcomes for Students

For the students there are five outcomes from this program-level capstone experience.

v. It is the culmination of the MBA executives' learning over their program. Accordingly, it demonstrates their attainment of the learning outcomes of their MBA-level study.

vi. It enables the students to experience how to integrate their application of the core and functional capabilities of EBM (Figure 1).

vii. It enables students to synthesise their diverse learnings from the multiple

disciplines they have studied with their own prior learnings from experience. As such, it prepares them to implement their learnings in practice. It provides a student with an opportunity to frame their academic learnings in an industry-oriented style suited to the practice context.

viii. It is a basis for meta-cognitive development. Students reflect holistically on their program of learning, what they have learned, and what this can mean for them moving forward in their careers.

ix. Many students implement their recommendations in their workplace. In so doing they build on outcome iii above as they apply the principles of evidence-based management in practice. They also build on outcome iv above. This is because implementation experience opens new opportunities learning and reflection, this time in their work practice context.

Course-Level Capstone

Post-graduate Coursework Capstone

Within our postgraduate programs, students are required to take a course on evidence-based management, recommended during their first semester. They are subsequently re-exposed to the key principles across other courses in their program. Since their program capstone course will be focused on their chosen discipline, their initial course on EBM is the appropriate setting for a capstone project on EBM. The structure of this course-level capstone is like that at the program-level. However, we describe variations required to adjust for the different circumstance of postgraduate study and depending on whether the course is for experienced executive or pre-experience students.

Design

This capstone is conducted as an end-of-semester assessment task that integrates work submitted by the students earlier in the 14-week semester (Figure 5). It takes the form of a business-styled report or presentation that provides a proposal for action (named "Action Briefing") to resolve a problem identified by the student.

Figure 5, Post-graduate Capstone Schedule

WEEK	EVENT	NOTES
1	First seminar: Methods	Students may book 1-to-1 consultations with the instructor at any time during Weeks 1-14.
2	First consultation: selection of topic	Required if the student is proposing their own topic.
3		
4	Submission: Problem statement.	
5-6		
7 8	Mid-semester break.	• Students are expected to continue working on their topic over the break. • Consultation is available but there is no formal teaching offered during the break.
9		
10	Submission: CAT report	
11-13		
14	Submission: Action Briefing (oral) OR Submission: Action Briefing report (written)	Students have the option of submitting their Action Briefing as a written report or as a one-to-one oral presentation to the instructor.
Post-Semester	Submission: Self-reflective review (written or audio recording).	The reflection is due one week after the semester ends.

Topic

Some students have industry experience. These students are encouraged to negotiate their topic or problem with the instructor during Weeks 1-2. For them the mistakes in proposing a topic are like those for topic selection at the program level. However, time constraints are greater since the students must learn the principles of EBM during the same semester, reducing still further the time available for working on their capstone.

A further problem in this course-level capstone is difficulties in accessing organisational data to justify their defined problem. This may be for reasons of information security or privacy;

or may be due to lengthy timelines for data to be released. Whatever the reason, the student may need to consider an alternative topic or seek other evidence to justify the problem. In the latter case, a combination of scientific research and industry data or stakeholder evidence might resolve the problem.

By contrast, most pre-experience students lack a suitable work context to draw on. For them we provide a detailed case study. This case study includes an organisational briefing that situates the student as an analyst offered a selection of 3 topics from a portfolio of organisational issues to be addressed in preparing a corporate action plan. The student selects one of the 3 topics. They then review the evidence in the case study to identify a problem to focus on. The case study includes datasets of organisational and stakeholder evidence designed to be unique for each student. For example, one case study scenario is the preparation of a corporate environmental action plan. In this case study students are provided with datasets covering Water Usage, Waste Management, and Thermal (CO_2-producing) Energy Usage. For this case study a student might select Waste Management as their topic. On close inspection of the evidence provided, that student might determine that the problem they will focus on is that hazardous wastes are causing environmental damage. Another student that selects Waste Management as a topic might identify limited recycling as the problem they will focus on. Yet another student might select Water as their topic and identify the use of pumped groundwater as the problem they will investigate. Students are thus unlikely to have the same problem to study. Even if they do, they have different datasets and thus can't swap results.

The scenario and evidence provided as part of the case study are drawn from actual organisational data and reflect real-world cases. They thus introduce the students to the uncertainties and complexities of applying EBM principles in practice. The topics also offer opportunities for students to develop transdisciplinary thinking skills. For example, in the recycling waste example described earlier, employee behaviour issues might arise in determining an appropriate intervention to the recycling problem. In this case organisational and individual behaviours intersect with the physical properties of wastes, both recyclable and non-recyclable. For pre-experience students, such insights add value to the capstone.

Guidance for Students

For pre-experience students, a several thousand word report such as the MBA capstone can seem formidable. By spreading the work over multiple, shorter, discrete tasks, students can demonstrate learning outcomes in a less challenging way. Guidance can support the student directly. The guidance also provides insights on student progress, helping the teaching team better support them.

We provide guidance to the students throughout the semester in six ways.

1. *11 weekly tutorials:* During Weeks 2-14 students attend tutorials to practice the tools and techniques taught during the weekly lectures. In the tutorials students participate in group exercises covering identification of problems, construction of questions, identification of cognitive and social biases, literature search, appraisal of trustworthiness of research articles, stakeholder management and facilitation, calculation of trustworthiness using Bayes rule, development of logic models, and selection of assessment measures. These tutorials give the student frequent opportunities for peer-based learning.
2. *10 weekly exercises applied to their selected topic:* During Week 2-13 student apply the concepts and tools taught in the course before deploying them in the capstone assessment. These exercises apply the concepts and tools to their individual or case-study topic. The exercises cover problem identification, run charts, boxplots, aggregation methods, correlation coefficients, stakeholder identification and data collection, use of Comparative Judgment, Weighted Additive Model, Analytical Hierarchy Model, and selection of measures for assessment. These exercises are undertaken individually to prepare the students for the individual capstone. They receive feedback on these exercises from a peer in paired exercises during weekly tutorials in Weeks 3-14. They also have opportunities during the tutorials to clarify and apply their own understanding of the course concepts by providing feedback to a peer themselves.
3. *Feedback on business report writing and oral presentation skills*. Students are able to develop these skills incrementally over the semester through feedback on the structure, clarity and format of their work before applying these skills in the capstone task.
4. *Feedback on their problem statement:* Students submit a draft of their problem statement by the end of Week 4 of the course. Just as for the MBA capstone, this submission gives several weeks for the student to clarify their thinking about the problem. It also allows enough time for students to consolidate their understanding of some key concepts in evidence-based management that are needed to be able to frame their proposed problem. However, it is also early enough in the semester to permit the teaching team to monitor the proposed problems to intervene early enough to re-focus the student if necessary. The feedback received on this submission can be used by the student to refine their problem definition for inclusion in the capstone report.
5. *Consultation:* Although students are not generally required to consult with their instructor or tutor, they have multiple opportunities to do so every week throughout the semester.
6. *Guidance notes and videos:* Typically, some students have problems with scheduling and access to consultation. Others are simply reluctant to seek personal consultation.

For these students, further guidance is needed. In addition to the Guidance Notes at Figures 10 and 12, exemplars and videos have been provided to support the students. An exemplar was provided in previous years but some students chose to cut-and-paste text from the exemplar rather than to develop their own submission. As a result, exemplars are no longer provided. But a video of no more than 15-20 minutes in length that describes the requirements of their capstone submission in more detail can be valuable in assisting the students in understanding where they are going. We advise them to watch it twice. The first time they should watch it all the way through. They can then select individual sections in turn to watch again as they make their way through preparing their submission. To facilitate this, clear visual markers of section changes are provided (changes to the colour of backgrounds) so that the students can skip through easily.

Assessment

Requirements

As for the program-level capstone discussed previously, this course-level capstone is submitted as a business report with academic citation and referencing. It differs in its reduced size and weighting. The length is 600-800 words, supported by up to 6 tables and figures (Figure 6). It is weighted at 30% of the total mark.

Figure 6. Required Structure of Course-level Action Briefing Submission Adjustments

SECTION	CRITERIA	MARKS
1. Problem definition	• Define the problem including brief background and context for the problem. • Justify the report using at least one of the four forms of evidence used in Evidence-Based Management. • If appropriate, show the evidence in a table or figure.	10%

SECTION	CRITERIA	MARKS
2. Aggregation of evidence	• Summarise and appraise the findings from the evidences previously obtained. • Discuss the degree of consistency or inconsistency between the sources of evidence. • Provide a table that draws on and aggregates the scientific evidence from your CAT Report. The table should show no information other than: 1. the citation for each article, 2. the trustworthiness of the article, 3. the aggregated trustworthiness of the body of articles using Bayes Rule, 4. any notes relevant to each individual assessment of trustworthiness.	20%
3. Decision	• Present 2-3 options and document the decision-making process leading to your proposal for action, including citation of any sources that contributed to your decision. • Include a PICOC. • You may include one other table or figure to document the decision-making process.	20%
4. Recommendations	• Provide a logic model in a table summarising the proposed action; no content irrelevant to the logic model will be accepted. • Recommend 5-10 numbered actions required to apply the evidence to the problem. Recommendations should be 1-2 sentences in length.	20%
5. Implementation issues	• Identify 1-3 constraints, potential problems, stakeholder concerns, or other matters to be considered in implementing the recommendations(s).	10%
6. Assessment	• In a table, propose measures and frequency for undertaking assessment of recommended actions, together with notes on any special considerations for particular measures. • Discuss 1-3 potential problems that may occur in undertaking the assessment.	20%

SECTION	CRITERIA	MARKS
7. References	• A reference list of all materials cited is required.	-
8. Appendices	• Optionally, you may locate supporting materials in appendices.	-

Adjustments

There are four key adjustments made to support the lower size of this capstone task. The effect of these adjustments is to support a complex report without assigning students a too-heavy workload at end-of-semester.

A. One adjustment is that we omit the Critically Appraised Topic (CAT) from this capstone report. This does not compromise the capstone report because students have submitted a CAT Report earlier in the semester. (see Figure 5) They thus are still able to draw on that evidence.

B. Another adjustment is that we only expect the students to generate one logic model. For the MBA program capstone, a logic model of the current state is provided as well as one for the future state. For the post-graduate course capstone, only the future state logic model is required.

C. A further adjustment is that these students are not required to obtain stakeholder evidence for their capstone report. Students are required to demonstrate their ability to plan the acquisition of stakeholder or professional evidence during weekly exercises earlier in the semester (see points 1 and 2 under *Guidance for students*, above). However, undertaking surveys or focus groups to acquire evidence is time-consuming and not practicable in this one-semester course.

D. The final adjustment is that students may also incorporate tables and figures they generated in weekly case study exercises throughout the semester (see point 2 under *Guidance for students*, above). These inclusions add depth to the capstone report but do not impact word count. As well the work for these inclusions was staged over the semester rather than being undertaken in the last weeks of the semester.

Importantly, by allowing a lower word count the students are encouraged to focus their writing. This leads to clearer, more structured submissions. Some students have attempted to use tables to circumvent the limited word count. For this reason the number of tables is tightly specified. By contrast, typically the High Distinction submissions are characterised by word counts that are 10-20% below the maximum. The students are also offered the choice of presenting their Action Briefing as a 6-minute oral presentation supported by 6 slides. This improves accessibility for students and also offers a more authentic format. While not many students take up the option, those that do enjoy it and the immediate feedback they receive.

Students also reflect on their learning from across the course in a submission of up to 1100 words, weighted at 10% of the total mark. The reflection responds to four questions on their learning, how they may implement their learnings, and how their future capacity for learning will be impacted by this learning experience.

Taken together, these submissions assess the student's attainment of the core and functional capabilities of evidence-based practice in management at a level appropriate for post-graduate study (Figure 7).

Figure 7.Mapping of the Assessment Structure of the Course-level Capstone to the Core and Functional Capabilities (Figure 1) of Evidence-based Management

SUBMISSION:	**ACTION BRIEFING**							**REFLECTION**
SECTION: ***CAPABILITY:***	**1**	**2**	**3**	**4**	**5**	**6**	**7**	
ASK	X							
ACQUIRE	X					X	X	
APPRAISE		X						
AGGREGATE	X	X	X					
APPLY			X	X	X			
ASSESS				X		X		
Leadership, Change and Stewardship			X	X	X			X
Knowledge generation and translation	X					X		X
Critical and analytical skills	X	X	X		X	X		X
Meta-cognition								X

Marking Criteria

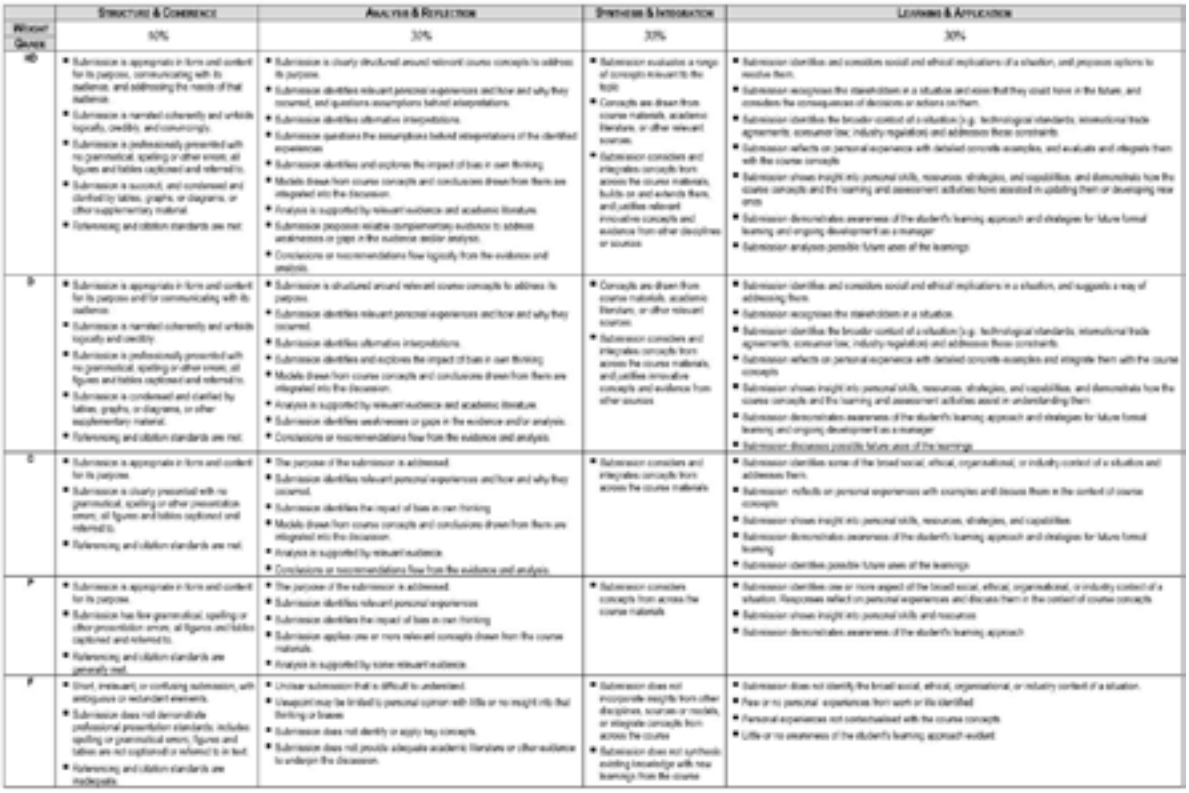
For pre-experience or undergraduate students, it is important to provide detailed guidance on assessment tasks. While the required structure of the capstone submission (Figure 6) tells the students what they write, the marking criteria tell them how well they should write for a particular grade (Figure 8). These marking criteria also assist the marker to determine the marking to be allocated to content provided by students in their submission.

Figure 8, Marking Criteria for the Capstone Report

Grade	Structure & Coherence (Weight: 30%)	Analysis (Weight: 40%)	Contextual Awareness (Weight: 30%)
HD	• Submission is narrated coherently and unfolds logically, credibly, and convincingly. • Submission is professionally presented with no grammatical, spelling or other errors; all figures and tables captioned and referred to. • Submission is succinct, and condensed and clarified by tables, graphs, or diagrams, or other supplementary material. • Referencing and citation standards are met.	• Submission is clearly structured around relevant course concepts to address its purpose. • Models drawn from course concepts and conclusions drawn from them are integrated into the discussion. • Submission identifies alternative interpretations. • Analysis is supported by relevant evidence and academic literature. • Submission proposes reliable complementary evidence to address weaknesses or gaps in the evidence and/or analysis. • Conclusions or recommendations flow logically from the evidence and analysis.	• Submission identifies and considers social and ethical implications of the case, and proposes options to resolve them. • Submission recognises the stakeholders in the case and roles that they could have in the future, and considers the consequences of decisions or actions on them. • Submission identifies the broader context of the case (e.g.: technological standards, international trade agreements, consumer law, industry regulation) and addresses these constraints. • Submission is appropriate in form and content for its purpose, communicating with its audience, and addressing the needs of that audience.
D	• Submission is narrated coherently and unfolds logically and credibly. • Submission is professionally presented with no grammatical, spelling or other errors; all figures and tables captioned and referred to. • Submission is condensed and clarified by tables, graphs, or diagrams, or other supplementary material. • Referencing and citation standards are met.	• Submission is structured around relevant course concepts to address its purpose. • Models drawn from course concepts and conclusions drawn from them are integrated into the discussion. • Submission identifies alternative interpretations. • Analysis is supported by relevant evidence and academic literature. • Submission identifies weaknesses or gaps in the evidence and/or analysis. • Conclusions or recommendations flow from the evidence and analysis.	• Submission identifies and considers social and ethical implications of the case, and suggests a way of addressing them. • Submission recognises the stakeholders in the case. • Submission identifies the broader context of the case (e.g.: technological standards, international trade agreements, consumer law, industry regulation) and addresses these constraints. • Submission is appropriate in form and content for its purpose and for communicating with its audience.
C	• Submission is clearly presented with no grammatical, spelling or other presentation errors; all figures and tables captioned and referred to. • Referencing and citation standards are met.	• he purpose of the submission is addressed. • Models drawn from course concepts and conclusions drawn from them are integrated into the discussion. • Analysis is supported by relevant evidence. • Conclusions or recommendations flow from the evidence and analysis.	• Submission identifies some of the broad social, ethical, organisational, or industry context of the case and addresses them. • Submission is appropriate in form and content for its purpose.
P	• Submission has few grammatical, spelling or other presentation errors; all figures and tables captioned and referred to. • Referencing and citation standards are generally met.	• The purpose of the submission is addressed. • Submission applies one or more relevant concepts drawn from the course materials. • Analysis is supported by some relevant evidence.	• Submission identifies one or more aspect of the broad social, ethical, organisational, or industry context of the case. • Submission is appropriate in form and content for its purpose.
F	• Short, irrelevant, or confusing submission, with ambiguous or redundant elements. • Submission does not demonstrate professional standards; includes spelling or grammatical errors; figures and tables are not captioned or referred to. • Referencing and citation standards are inadequate.	• Unclear submission that is difficult to understand. • Submission does not identify or apply key concepts. • Submission does not provide adequate academic literature or other evidence to underpin the discussion.	• Submission does not identify the broad social, ethical, organisational, or industry context of the case.

The marking criteria are worded to be independent of format. Students can thus be assured that their choice of oral or written presentation will make no difference to their final mark for the capstone submission. Similarly, as suggested by comparison of the marking criteria for the capstone (Figure 8) and the reflection (Figure 9), the standard across marking criteria for different assessment tasks is kept very constant. Again, this ensures that students perceive the marking standards to be consistent across their study.

Figure 9. Marking Criteria for the Reflection



Students' Concerns

Some concerns can commonly arise for students as they prepare these course-level capstones. These are typically related to their youth and inexperience. Yet even where students have industry experience they may need guidance if they have little management experience. Through their coursework the students will be familiar with the tools and techniques required. They can all generally get started on the scoping of the problem statement as they have already received feedback on a previous submission. However, as they move further into the capstone there are two concerns that may cause difficulties in drawing together the elements of the capstone into a coherent study.

One concern is that a student may find that their topic does not seem to fit the requirements of the Brief (Figure 6). For example, a student may worry because they cannot see how to decide on a particular approach from strongly conflicting evidence in the literature. The guidance required here is to assist them to think through how to apply the principles of evidence-based thinking under less obvious circumstance. In this example (where evidence is highly conflicted) they might consider recommending the acquisition of organisational

evidence to resolve the conflict through a pilot study. Issuing a Guidance Note such as the example at Figure 10 early in the development of the capstone can assist students to think through these scenarios.

Figure 10. Guidance Note: Things to Think about When Preparing Your Action Briefing. A&B files

THINGS TO THINK ABOUT WHEN: PLANNING YOUR ACTION BRIEFING

This discussion may clarify some things you need to think about when planning your Action Briefing. It does not replace the Brief, the Class Summary, or the teaching materials, and so should be read in conjunction with those documents.

This may be the only discussion of the proposal that senior management sees...so it needs to document the thinking and the evidence base behind the proposal, but do so succinctly. The content specified for this Report focuses on the key aspects of the proposal that will impact making a decision about the proposal - whether to reject it or to proceed.

Problem Definition: The problem definition provides context for the reader and so will be similar to the problem definition in your previous reports. You should define the problem you are going to fix and justify it with at least one piece of evidence. This definition may be the same as that in your previous report/s or you may refine it in the light of feedback you have received on those report/s... You need not specify any solution/s here - it/they can emerge from your discussion of your evidence and be detailed in the Recommendations.

Aggregation: The Action Briefing draws together the findings from the evidence you have previously gathered (eg. through the Problem Definition, the CAT Report, and any other evidence you may have gathered). You may need new evidence to justify your proposed measures or to support other aspects of your discussion, but you do not need to find new evidence to support your defined problem or your proposed intervention (unless you have received feedback on previous assessments to say your evidence was insufficient).

If your evidence suggests several possible solutions/interventions then for this assessment task it would be easiest to select just one. To do this discuss your findings and justify your selection of specific intervention/s in the light of that evidence. But note than in a real-world situation you might select a bundle of several solutions as part of a program of interventions.

If you have contradictory findings then consider a Bayes theorem calculation to resolve the inconsistency. And whether your evidence is contradictory or not, a Bayes theorem calculation will assist you to aggregate the various pieces of evidence and understand the overall likelihood of success (this can come in handy in undertaking sensitivity analysis). We provided a table that will help you determine the P(E|H-true) and P(E|H-false) for pieces of evidence of different types. You need to show a table in your Report that lists each round of calculation, and for each round shows:

- a brief description of the piece of evidence,
- the Prior,
- the P(E|H-true),
- the P(E|H-false), and
- the Posterior.
- a Notes column for any specific remarks about why you selected some particular values (e.g., for the initial Prior, or the types of evidence other than scientific research).

Your recommendation would ideally be to operationalise a specific solution and you could choose to include a PICOC to clarify it. However, if evidence did not point that way you might recommend acquiring further evidence.

- You could recommend that the scientific evidence be searched again, particularly if you have undertaken the search on a limited database. In a real-life situation this might indeed be the sensible next step. However, for this assessment item, if you choose this option you will still have to discuss all the requirements – and if you didn't find relevant evidence for your CAT Report it's hard to see how you will recommend a more successful alternative.
- Remember there are four sources of evidence, not just one, so consider what you could recommend to obtain evidence from one or more of the other sources. Keep in mind that professional evidence is the least reliable, and stakeholder evidence is reliable about perceptions rather than about actuality. That leaves organisational evidence as a sensible place to start, so perhaps you could recommend some steps to obtain evidence specific to the organisation that would help you answer the question. For this assessment item you would still need to address implementation issues and assessment for those recommendations.

Implementation Issues: This is where you discuss any significant impact that needs to be considered and managed during the implementation. They may arise from external factors (such as stakeholders, policy, resourcing, legislative or other constraints, etc). There may also be issues or difficulties that arise from the nature of your selected intervention. As well, steps to mitigate any identified issues would be included here. For example, if the proposal is to launch a new financial product to meet the needs of a specific customer group then one matter to consider (in Australia) is the need for registration of the financial product and the statutory time limits on that. This is not a problem, but it is a task, and the statutory time limits place legal constraints on the timeline.

For those using a supplied case study, you do not know much about the organisation and its context, but use what you do know. Ask yourself how the factors you do know about would impact the implementation of your proposed intervention? Consider also what boundary factors (moderators) you read in the literature that may impact in this scenario.

Assessment: Here you discuss what you will measure? how will you do it? why is that appropriate? consider also the timing of measurements. "Potential problems" are things that could go wrong as a result of actions needed to assess the implementation (including measuring the outcomes). You need to identify these so that you can identify strategies to mitigate or prevent them. For example, a public health intervention (cancer screening, for instance) will take decades to impact the community, so what supplementary or surrogate measures could you put in place to monitor success in the shorter term, when would they happen, and what risks would that bring?

Recommendations: These tell us **how** you are going to implement your intervention - what new or changed activities or processes or data collections will make this happen? Consider numbered points that each describe a specific activity or process necessary to make the implementation happen, including facilitation of stakeholder involvement and engagement, steps to address any implementation issues, how you propose to measure the success of the intervention and any necessary data collection for monitoring the process. Together these recommendations will total all the necessary changes required. Given the Brief, you would probably be aiming for around 5-10 numbered recommendations of 2-3 sentences each. You do not need to provide a project plan with work breakdown, stages, schedule, etc. That would be a sensible step after the proposed intervention is approved, but it happens after approval and is out of scope for this course.

A logic model helps you think through the proposal, and provides an overview of the proposal. Remember:

- **Budget** does not belong on a Logic Model. It is represented by the Inputs and so should not appear as an Assumption or an External Factor either.
- **Outputs** are 'tickables' - they have physical presence in the real world.

2

The First Half of the Capstone Report

This half covers problem definition, aggregation of evidence, and a decision to select between options to address the problem. When aggregating their evidence students may have difficulty in drawing together the multiple sources of evidence they have acquired into a coherent argument leading towards a decision. They may also have trouble in integrating the calculation of trustworthiness for the articles they have acquired in response to their CAT Question. One approach to getting the students over this hurdle is to recommend that they commence this section with a formalised sentence (Figure 11). This formalised structure draws on some of the learning materials as well as students' previous submissions. The formalisation shows the students how to navigate these resources and generate a summary statement. With this opening position established they can then be invited to compare and contrast it with their other sources of evidence.

Figure 11. Suggested Initiation of Aggregation Discussion

ELEMENTS OF OPENING SENTENCE:

* <number of articles>
* " pieces of scientific research "
* <"show signs that"/"suggest that"/"show that">
* <body of CAT question>
* " (Table "
* <sequence number of table with Bayes Rule calcula tion of trustworthiness>
* ")."

Example: *A student presented 7 articles in their CAT Report, most of which did not support the hypothesis that low job satisfaction predicts resignation. The opening sentence of their aggregation discussion in their Action Briefing might read:*

"Seven pieces of scientific research suggest that job satisfaction does not impact turnover intention (Table 2)."

Considering options for resolution of the problem can cause difficulties for some students. This is primarily due to them not looking further than a particular preferred solution. Reminders of the importance of the 'do nothing' option as an alternative to a solution can help them to consider other options. A further problem then emerges when they move towards demonstrating how they settled on selection of a particular intervention or bundle of interventions.

Tools introduced previously, such as Weighted Additive or Weighted Multiplicative Models or Analytic Hierarchy Models, can assist them to document their decision-making process. A Guidance Note on *Responding to a Problem: Planning interventions* (Figure 12) gives some further approaches for students to consider.

Figure 12: Guidance Note: Responding to a problem – Planning interventions

RESPONDING TO A PROBLEM - PLANNING INTERVENTION

When moving towards actioning a response to a problem, think of the situation through the lens of the 3 part problem chain (cause-mechanism-problem-impact-consequence)

1. An intervention is simply an action we take to change a situation.
2. So, an intervention to improve the situation could:
   - remove the cause,
   - interfere with the mechanism,
   - fix the problem,
   - reduce the impact, or
   - minimise the consequence.

   For example: if long working hours among service staff cause stress and staff leave as a result, then as a manager you could:
   remove the cause (i.e., shorten working hours)
   interfere with the mechanism (e.g., offer frequent rest breaks during work)
   - fix the problem (e.g., offer therapies to treat stress)
   reduce the impact (e.g., offer longer vacations to overcome built-up stress)
   minimise the consequence (e.g., offer higher pay to entice staff to stay)
3. Sometimes, one solution is 'preferred' - perhaps it is popularised by management gurus, or a senior manager has a fixed view about its desirability - but that solutioneering is not necessarily the only or even the best approach.
4. And if there is such a bias towards a particular solution then it would be sensible to specifically explore what the scientific literature says about the effectiveness of that solution, because the scientific literature is the least biased form of evidence and so may provide some ammunition to overcome that 'preference' bias.
5. What this all means is that there may be one or more possible interventions, and it would be wise to explore more than one. And don't need to restrict yourself to one intervention. A bundle is safer as it provides alternatives in the event that one or more of the bundle do not work as expected, and even if they all work, the outcome in terms of resolving the problem will be larger and more reliable over time.
6. So, we need to ask questions about possible solutions, as well as about the problem, in order to gather evidence to help us make decisions about each possible solution. Taking the scenario at 2 above as an example:, you might have the following questions (among others):
   - What does the scientific literature say about how effective therapies to treat stress are?
   - What does the scientific literature say about how effective higher pay is in reducing resignation of staff?
   - What does the scientific literature say about the efficacy of rest breaks in managing stress?
   - Does the Board consider longer vacations to be a feasible option? How much will it cost?
   - What suggestions do service staff have for resolving the situation?
   - Has the organization tried to implement shorter working hours before? If so, what happened?
7. You will also need to think about other issues in selecting a bundle of possible interventions, including:
   - ecological validity
   - economic evaluation (cost benefit, cost-effectiveness, cost-utility, etc)
   - fiscal barriers (acceptability to leaders and stakeholders, alignment with strategy, etc)
   - resource availability

The Logic Model

A logic model of the proposed intervention is a crucial element of the capstone report and should not be omitted. It provides a clear pivot between the two halves of the report. On the one hand, the retrospective first half of the capstone report discusses the existing problem and how to resolve it, resulting in a decision. On the other hand, the prospective second half of the capstone report draws on the recommendations to identify implementation issues and describe the outcomes. The logic model bridges from the decision to the recommendations.

Two key supports are offered to students to assist them in understanding how to construct logic models. One is to focus an in-class exercise on preparation of a simple model. The other is to then provide a video that works through a more complex example (see also point 6 under *Guidance for students* above). The video on logic models is in 2 parts. The first part explains over 15 minutes how and why logic models work. The second part works through an actual

case derived from a large organisation over 23 minutes. Students are recommended to watch both videos in full. Then they are advised to watch the second video demonstrating an example step by step as they prepare their own logic model.

The Second Half of the Capstone Report

This half includes the recommendations, implementation considerations, and a plan for assessment of the intervention. Once students have prepared the first half of their capstone report and completed the logic model they are typically more confident about completing the report. Nonetheless they may still need some guidance.

One common thread of questions is, "Why do I need to list recommendations? I've already documented my decision? What's the difference between the decision and recommendations? Here a distinction needs to be drawn between the two. In the first half of their capstone report students have decided to implement a particular intervention. However, selecting that option is not enough; a series of enabling recommendations is also needed to action the decision. For example, a student is investigating a problem of high turnover in their workplace. On the basis of their research, they may have decided that improving organisational commitment among staff is the best way to reduce turnover. But simply saying "we will increase organisational commitment" is not enough. A series of actions are needed to make that happen, and it is up to the student to recommend those actions. In this example, those recommendations could include conducting focus groups to understand the local barriers to commitment, training managers in appropriate supervisory practices, and revising local processes for staff development. Some recommendations may be required to manage implementation issues, adjust for external factors that may otherwise work against the proposed intervention, or overcome interference with data collection required to measure the outcomes—in this case, the outcomes of increased organisational commitment and reduced turnover.

The student's recommendations will draw on a wide range of materials. These include their academic reading, their logic model, their consideration of implementation issues, and possibly stakeholder or organisational evidence. To keep their recommendations focused, students can be advised to limit the number of recommendations to less than ten and to specify each recommendation as a single sentence where possible, preferably no more than two.

Outcomes for Students

Only a handful of post-graduate students can implement their recommendations in their workplace. Many of them are studying full-time so it would not be feasible even if they wanted to. But, as for the program-level capstone discussed previously, this capstone provides important feedback to the students.

i. It demonstrates their attainment of the formal course learning outcomes.

ii. However, and even more importantly than for the MBA students, it is also a learning experience. It enables the students to experience how to integrate their learnings into a coherent business proposal. For pre-experience students this is an invaluable learning, even more important than for the MBA students.

iii. Finally, integration with the reflection builds the meta-cognitive capacities that are essential to support the evidence-based practitioner after graduation, long after they leave formal study.

Conclusion

These two examples demonstrate that a capstone project is an appropriate means of completing studies in EBM. However, a capstone project need not be seen as fixed. Its particulars can be tailored to the needs of the student cohort. With those adjustments, capstone projects allow students to integrate their learnings from a semester or from a multi-year program of study. A capstone project can also have benefits that go beyond its function as an item of assessment. Chief among these is the opportunity for students to apply their EBM learnings to a practical business problem. In doing this the capstone project helps the student to transition into becoming an evidence-based practitioner.

Reference

Barends, E., Rousseau, D. M., & Briner, R. B. (2017). CEBMa guideline for critically appraised topics in management and organizations. Center for Evidence-Based Management. https://cebma. org/wp-content/uploads/CEBMa-CAT-Guidelines.pdf.

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Combining Cases and Research Proposals to Teach Evidence-Based Management

R. Blake Jelley and Tina Saksida

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Combining Cases and Research Proposals to Teach Evidence-Based Management

R. Blake Jelley and Tina Saksida

This chapter describes projects that support learning about evidence-based management in the University of Prince Edward Island's (UPEI's) McDougall Faculty of Business, with particular emphasis on a project involving a case-based research proposal. Teams of undergraduate research methods students develop research proposals in response to a data collection opportunity outlined in a case stimulus; this fictional case is inspired by a published field experiment or quasi-experiment. Using a case stimulus allows novice researchers to focus on making methodological choices without having to first identify a topic to investigate. The direction provided via the case is meant to reduce excessive cognitive load on new researchers. It also provides a realistic applied-research task by framing the research-consultant role as part of a scholar-practitioner collaboration. The case alludes to relevant literature which teams may locate and use to formulate their proposal. The top three teams in each course section compete further for extra marks, with a panel of judges challenging them about their research design choices. All students can learn from the ensuing discussion about the various decisions different teams made in response to the same fictional data collection opportunity. We discuss adaptations of this approach used with Executive MBA students, including one where students write a case and develop an evidence-based teaching note to accompany it in Saksida and Jelley (2024) in this book.

The present chapter describes the design, execution, and evolution of a case-based research proposal project for undergraduate student teams. The project requires student teams to develop a research proposal based on a data collection opportunity outlined in a case scenario inspired by published field research. The project has been designed to challenge students to plan, but not execute, a study with the objectives of solidifying their knowledge of research methods

(Bougie & Sekaran, 2020) and the evidence-based management (EBMgt) framework (Barends et al., 2014; Briner et al., 2009). Our focus herein is on this case-based research proposal project and an associated competition rather than all aspects of the course in which it is embedded.

Institutional Context

Explicit instruction in EBMgt in the UPEI McDougall Faculty of Business began with the launch of an Executive MBA (EMBA) program in 2008. At the undergraduate level, the 2015 addition of an introductory research methods course brought more specific coverage of EBMgt beyond preliminary introductions in other courses with like-minded instructors (e.g., organizational behaviour and human resource management). UPEI introduced an MBA in Global Leadership (MBA-GL) program in 2018 that has a curriculum distinct from the EMBA program. Still, both MBA programs have included projects that involve systematic approaches to literature reviews and rely on similar resources, such as the Center for Evidence-Based Management (CEBMa) guidelines (Barends et al., 2017a; 2017b) and examples of abbreviated systematic reviews (e.g., CEBMa, 2020; Jelley, 2021). In the present book, our Saksida and Jelley (2024) chapter describes our institution and EBMgt-teaching story more broadly.

Gamble and Jelley (2014) noted successes enjoyed by UPEI's inter-university case competition teams (e.g., 19 top-three finishes in 24 competitions). Our faculty members have also disseminated insights about EBMgt education (e.g., Jelley et al., 2012; Saksida & Jelley, 2018). The research proposal case competition draws on those strengths and lessons from the EBMgt teaching community (e.g., Dietz et al., 2014; Goodman & O'Brien, 2012). We note adaptations of EBMgt education involving cases for graduate-level student projects briefly in this chapter and elaborate on those applications in Saksida and Jelley (2024) in this book.

Course Context

The UPEI McDougall Faculty of Business' *Research and Evidence Based Management* course (BUS 2880) is a required component of our undergraduate business degree programs. It is available to students in second year or higher. BUS 2880 is fundamentally an introductory business research methods course that covers design, measurement, and analysis issues conceptually rather than computationally. Quantitative data analysis topics include the logic and limitations of null hypothesis significance testing and interpretation of results whereas other courses in our program focus on computational skills. BUS 2880 instructors draw explicit attention to the criteria needed to make a defensible cause-effect inference while also introducing a variety of qualitative and quantitative methods suitable for different research purposes. BUS 2880 is intended to refine students' critical thinking skills and information literacy to help address Rubin and Dierdorff's (2009) *managing decision-making processes* competency category that involves using information and judging qualities of people, products, or services.

Student grading in BUS 2880 includes individual testing (55% of the course grade), participation and professionalism (15% for contributions in-person, online, or both), a small (5%) component about using research literature, and the group project – the focus of the present chapter – worth 25% of a student's final grade.

Student teams must apply lessons from the course to plan an appropriate study. Beyond course material, the more successful teams not only consult but thoughtfully adapt substantive and methodological insights from relevant literature. A separate course unit provides students with information about the "Effective and Responsible Use of Literature" (ERUL). An online ERUL quiz is worth 5% of a student's course grade. For the ERUL quiz (vs. other tests), students have been allowed to count their highest score from two attempts. A common practice is for the instructor to set the learning management system (in this case, Moodle) to grant access to the ERUL quiz after a student has completed the university's Academic Integrity digital badge. During the COVID-19 pandemic, a set of asynchronous, online ERUL materials (i.e., readings and videos) replaced an in-person workshop with a librarian. Those approaches could be combined, but librarian-led training has not (yet) been re-introduced to in-person courses.

Evidence-Based Management as a Course Theme

The textbook (Bougie & Sekaran, 2020) used in BUS 2880 draws on examples from various areas of business research, including but not limited to management. Among the additional assigned readings is Barends et al.'s (2014) introduction to EBMgt's core principles and clarification of common misconceptions. Using EBMgt to frame coverage of course content is intended to increase the appeal of research methods to pragmatic students whereas the methodological content is intended to foster students' EBMgt-related knowledge and skill development (Jelley et al., 2012). That is, students are most likely to enroll in BUS 2880 to satisfy a program requirement. EBMgt can help convey the point that research methods knowledge has practical applications to support decision making in organizations – it is not limited to academic applications. Moreover, studying research methods can foster a more sophisticated understanding of the nature of evidence and associated claims and thereby support those who desire to apply an evidence-informed approach.

Evidence-based practice is supported by critical reflection about each of EBMgt's main elements: ethics and stakeholder concerns, practitioner judgment and expertise, evidence from the local context, and evidence and principles derived from formal research (Briner et al., 2009; Gamble & Jelley, 2014). The formal research methods covered in the Bougie and Sekaran (2020) text include the scientific method (i.e., hypothetico-deductive approach) and alternative approaches to careful, systematic research built on various ontological and epistemological assumptions (see also Rousseau et al., 2008). The "formal research" terminology

used in BUS 2880 is intended to provide an inclusive umbrella for social and behavioural research relevant to a broad range of research questions about management and organizations that is typically (but not only) published in peer-reviewed journals and often (but not only) conducted by academics.

The Briner et al. (2009) EBMgt framework provides a versatile basis for analyzing a variety of cases and applied problems (Gamble & Jelley, 2014). For example, Briner and Rousseau (2011, Table 1, p. 8) provided sample questions associated with each EBMgt element that could be used to better understand an alleged problem of high absenteeism (e.g., "What are my beliefs about the causes of absence? What actually is the absence rate? What does research evidence from systematic reviews suggest as effective interventions? How do employees feel about proposed interventions?"). The Briner and Rousseau (2011) questions formed the basis of an exercise that encourages a questioning mindset and EBMgt-element familiarization (Jelley et al., 2012, p. 345). BUS 2880 instructors have used that exercise to introduce the EBMgt framework early in the course; in addition, the framework features prominently in the course's major project. The project instructions (Appendix A) include a section, *An Evidence-Based Approach to Cases and Applied Problems*, that contains generic questions (extracted in Text Box 1) and considerations for each of the Briner et al. (2009) elements. Students can adapt those questions to the analysis of their assigned case and the substantive topic outlined therein.

Text Box 1. Questions Aligned with EBMgt Elements (excerpted from Appendix A)

Ethics and stakeholder concerns:

- Are there legal, moral, or values-based concerns to consider?
- Have you considered the concerns of everybody who might be affected by a decision?

Practitioner judgment and expertise:

- Do you (or does a protagonist in a case) have experience dealing with issues like those presented?
  - > How relevant is that experience in the present circumstances?
  - > How much trust can you place in any (alleged) "expertise?"

Formal research:

- To what extent do existing theories, principles, and research evidence provide perspective on the situation – e.g., its potential causes, consequences, and intervention strategies?
  - > How strong and relevant is the existing knowledge?

Local data and experimentation:

- What evidence exists in the organization that is relevant to your deliberations?
  - > What is the quality of that evidence?
- What additional evidence is needed?
  - > How could you conduct a study to gather such evidence?

Case-Based Research Proposals in an Undergraduate Research Methods Course

Consulting-style projects represent a form of problem-based learning, affording students opportunities to practice EBMgt skills in concrete ways (Dietz et al., 2014). Despite compelling arguments in favour of problem-based education to enhance student engagement and learning, such projects are complex and time-consuming (Dietz et al., 2014; O'Neill & Jelley, 2014). Live client engagements and full-cycle research projects did not seem to be a good fit for students new to research methods completing an approximately 12-week introductory course. Instead, the project described herein is an adaptation that requires "the design but not the execution of studies" (Dietz et al., 2014, p. 411). As explained in recent editions of BUS 2880 project instructions (Appendix A), a research proposal is a practical starting point for novice researchers. Preparing a research proposal is an authentic task for researchers who need to secure approvals (e.g., ethics, organizational access) or funding to conduct a research project. We believe that it provides a manageable and appropriate challenge.

Project Grading Criteria

The project grading criteria for BUS 2880 (summarized in Text Box 2; detailed in Appendix B) are appropriate for evaluating research proposals that outline plans for primary data collection, consistent with the research opportunities provided in cases used to date. Those or similar evaluation criteria could also be used with cases that call for syntheses of existing research (e.g., a Rapid Evidence Assessment; see also Barends et al., 2017a; 2017b; Rousseau et al., 2008).

Text Box 2. Evaluated Elements of Projects (see Appendix B for details)

- Executive summary (or Abstract)
- Description of the situation
- Use of the EBMgt framework
- Recommendations and specific action plans
- Grammar and formatting
- References

During one compressed (6-week) summer session, a BUS 2880 course designer pilot-tested a more detailed and prescriptive set of research proposal grading criteria to support an individual variation of the project, in concert with a peer feedback tool and process (Joordens et al., 2009). However, the criteria outlined in Appendix B, which are used in regular offerings of this course, seem to provide teams with reasonable pre-submission support while challenging them to come up with their own ideas. Of course, Appendix B also guides an instructor's evaluation of and feedback on submitted work.

For case-based research proposals, the research design and data collection plan constitute the "recommendations and specific action plans" element of the grading criteria (Appendix B). The instructor can also consider a team's data collection plan as part of a broader evaluation of how the team has used the EBMgt framework. The grading criteria sheet lists ethics and stakeholder concerns together with (protagonist) judgment and expertise as part of a broad evaluation of how a team has applied the EBMgt framework; those elements appear together to reflect our cases' emphasis on existing research and the team's planning of primary data collection. Consequently, we have conveyed through both subtle (e.g., Appendix B) and overt messages (e.g., second page of Appendix A) that space allocation in a team's proposal should reflect appropriateness for the case rather than assume that each EBMgt element should automatically be granted equal space.

Rationale for Using a Case Stimulus for the Research Proposal

Choosing a topic area and identifying a researchable angle to investigate can be a daunting task, even for experienced researchers. Active cognitive processing is functional for learning, but taxing learners' cognitive loads inappropriately can have detrimental effects (see Goodman & O'Brien, 2012). To balance the need to challenge and support novice researchers, BUS 2880 instructors have provided students with direction for their team's research proposal by

outlining a data collection opportunity via a case scenario. Student teams can focus on making methodological choices for their research proposal rather than also having to navigate the tricky path to choosing a topic. The research-consultant role students assume for the project requires them to consider a client's perspective. That provides a realistic preview of roles in applied research that often afford less freedom to choose topics than do careers in pure academic research. More advanced research-projects courses can be used to give students opportunities to pursue investigations related to their interests.

Dietz et al. (2014, p. 398) suggested that "case studies can be powerful stimuli for learning about EBMgt and academic research." The case method, which is (typically) a discussion-based teaching method where students analyze concrete situations and provide business solutions and recommendations, has been used in business schools for over 100 years and has become a nearly ubiquitous approach to management education (Mesny, 2013). With its focus on the particular over the general, the case method may at first glance appear incompatible with an EBMgt approach to business education. However, EBMgt proponents have challenged notions that case-based business education is necessarily contrary to the consideration of research-based principles or other aspects of evidence-based practice (Dietz et al., 2014; Gamble & Jelley, 2014; Goodman & O'Brien, 2012; Pfeffer & Sutton, 2006; Rousseau, 2006; Rousseau & McCarthy, 2007). Case-based teaching and learning can be adapted to support EBMgt education. Cases can provide opportunities for students to experience how "evidence-based general principles can inform (not dictate) complex, contextualized management decisions" (Gamble & Jelley, 2014, p. 435).

A case provides a narrative – usually in written form – about "a real or realistic organizational problem" (Goodman & O'Brien, 2012, p. 319). Goodman and O'Brien's perspective on case stimuli is not restricted to long, published accounts of real situations in organizations but can include scenarios prepared by instructors or found in sources like textbooks. BUS 2880 cases have been relatively short (2-4 pages), instructor-prepared, fictional scenarios based on published research. This approach was inspired by *The Theft Case* in Dietz et al. (2014). An unpublished version of that case has provided a more detailed model to emulate. The research-methods students' task of designing a study in response to a presented opportunity is a different focus from traditional business cases that call for students to make other kinds of recommendations to solve case-presented problems. Appendix C shows the sample case discussed in the next section.

Touring a Sample Case

Each BUS 2880 case provides the topic of the research proposal in the context of events in an organization and includes hints about literature to search. Following *The Theft Case* example (Dietz et al., 2014), BUS 2880 cases have had foundations in published studies. For example, the case author based *Transforming Leadership at Big Bank* (Appendix C) on Barling et al.'s (1996) transformational leadership training field experiment in a Canadian bank.

Changing cases regularly provides new cohorts of students with fresh challenges – students talk and share across semesters. BUS 2880 instructors have, however, rotated, disguised, and modified similar case content given the challenges associated with preparing completely new cases. From Fall 2015 through Winter 2024, there were 20 semesters in which BUS 2880 was offered (9 Fall, 9 Winter, 2 Summer). In each semester, all instructors used the same case for all groups in all course sections (see also The Competition section below). *The Theft Case* from Dietz et al. (2014) and the associated justice-based communication of bad news has inspired eight (8) of our cases so far. Goal setting has been featured in six (6) cases and transformational leadership training has been used for four (4) cases (like the sample in Appendix C). Another case involved team issues (unlikely to be re-used due to level of analysis complications) and a recent case featured self-management/self-leadership. The latter re-used the *Big Bank* context of the sample case but with different substantive considerations and references.

Case Introduction and Contextual Information

A BUS 2880 case follows the Dietz model, opening with an introduction or overview section that summarizes the data collection opportunity and highlights the unique, exciting nature of the chance to conduct a field experiment or quasi-experiment (e.g., Text Box 3 & Appendix C). The case introduces a given industry or issue in a section that provides general context (e.g., The Canadian Banking Industry section in Appendix C). The industry-information section sometimes includes an explanation of a practice or issue that is important to the research opportunity. The industry-information section is not usually central to the research proposal, but it helps make the case engaging to students by highlighting its practical context. The somewhat superfluous content in that section, and possibly elsewhere, also challenges students to discern material that is tangential to the research design focus. However, BUS 2880 cases limit the amount of extraneous material. A trend toward longer cases – older cases tended to be 2 pages long, but more recent ones have been 3-4 pages – reflects the inclusion of additional relevant material and references, not an increase in the proportion of content that may obfuscate the mission of our novice undergraduate researchers.

Text Box 3. Sample Introduction to a Case-based Research Opportunity (excerpted from Appendix C)

> "Dr. J. P. Arsenault could hardly contain her excitement! The professor had just finished a virtual meeting with Tamara Smith, a Regional Vice-President of Big Bank. Ms. Smith told Dr. Arsenault that she would allow the professor's team to design a field experiment to test aspects of transformational leadership theory in exchange for helping the company with its leadership development efforts in her region."

A section about the organization featured in the case (e.g., Big Bank, Region "O" in Text Box 4 & Appendix C) provides important information about the context for the students' proposed research, including organizational units or members that could be assigned to different levels of an independent variable (e.g., treatment and control groups). The sample case includes a larger number of branches and managers (N=30) available for study than did the original field experiment (N=20, Barling et al., 1996), and a simplified description of branch sizes. That is, the sample case includes features that make the fictional scenario both superior to and easier to navigate than the source study. Cases have presented realistic industry information and any associated challenges in constructive, progressive ways. Case protagonists have been portrayed as respectable, albeit imperfect, role models.

Text Box 4. Sample Description of a Fictional Organizational Context (excerpted from Appendix C)

> "Big Bank is a fictional Canadian Bank – an imaginary sixth addition to the big five banks. Tamara Smith is the Vice-President of Big Bank responsible for Region "O." That region has 30 branches, each with 25 to 50 employees. Each branch manager is responsible for the operation of that location, its employees, and the customer experience. Branch managers have 9-12 direct reports – employees who report directly to the branch manager. The branches are separated by geography and operate independently within the rules of Big Bank and guidance from their Vice-President. Vice-President Smith would like to improve her branch managers' leadership skills."

Case Protagonists

BUS 2880 cases have featured a research-supportive organizational sponsor (e.g., Vice-President Tamara Smith in Text Box 5 & Appendix C), responding to concerns about a shortage of business cases in which case protagonists seek and consider research evidence (Goodman & O'Brien, 2012; Rousseau, 2006). Showcasing a scholar-practitioner collaboration as part of this project may also plant a seed of possibility for students to consider in real situations.

Sections introducing protagonists have included one for a sponsoring manager and another for the professor who is assigning students to develop a research proposal (see Appendix C). The protagonists' background and expertise descriptions have been tailored to represent different levels of experience. Students may use that information to comment on practitioner expertise and judgement. The sample case portrays "an emerging leadership scholar" and an executive with much experience and admirable qualities but no formal education in leadership theory. Other cases have varied the protagonists' experience levels in different ways, but BUS 2880 case authors allude to a need for a new experiment or quasi-experiment. That is, the issue at

hand has not been settled by a protagonist's expertise, existing formal research, or both. As noted previously, neither practitioner expertise and judgment nor the ethics and stakeholder concerns elements of the EBMgt framework are intended to represent large portions of a team's submission in this context.

Text Box 5. Vice-President Tamara Smith:
An Example of a Research Sponsor (excerpted from Appendix C)

> "Although she is skeptical about leadership training, Smith sees the partnership with Dr. Arsenault's students as a chance to improve employees' work attitudes and branch performance indicators. Ms. Smith vaguely recalls that, years ago, a Canadian banking executive was able to do a similar study through a partnership with university researchers. The Vice President also suspects that a convincing demonstration about the effectiveness of leadership training in Region "O" could have implications for the rest of Big Bank, and for her upwardly mobile career."

Ethics

Even the EBMgt elements downplayed in BUS 2880 cases have demonstrated the value of encouraging deliberate reflection on all elements of the EBMgt framework. Student teams have sometimes used their analysis of ethics and stakeholder concerns to bolster arguments about the need to test proposed enhancements to management practices. For example, a team dealing with a case involving goal setting techniques with transport truck drivers marshalled arguments based on environmental ethics. The environmental arguments amplified the benefits of experimenting with goal-setting techniques to load transport trucks optimally and thereby reduce emissions generated by the fleet. Those insights expanded the perspectives offered in that case.

Research ethics is a topic covered in BUS 2880 that is relevant to teams' research proposals. Students are instructed in the course and reminded via the case project that considering the ethics and stakeholder concerns element of EBMgt requires a wider lens that includes but is not limited to research ethics considerations. In the sample case (Appendix C), Vice-President Smith discourages "the unethical sales practices that have caused public relations and legal problems in recent years for at least one major competitor." That statement reflects genuine concerns about high-pressure sales tactics in the industry (e.g., Financial Consumer Agency of Canada, 2018; Johnson, 2021). The case author opted not to elaborate or provide citations about that point to avoid distracting students too much from more central variables. Still, conceivably, a team could propose to investigate unintended negative side effects (e.g.,

employee or customer perceptions of high-pressure sales tactics) arising from an intervention. Even if teams do not recognize the possibility of investigating adverse effects, students should realize that improving unit results by any (unethical) means would not be acceptable to the executive featured in the case. This realization is relevant to a team's development of an ethical, evidence-informed intervention to test (i.e., independent variable).

Theoretical Background and Citations

Theoretical background information (e.g., the Transformational Leadership section in Text Box 6 & Appendix C) combines with language in the opening and closing sections to suggest an independent variable manipulation for students to develop, founded in existing research (e.g., a transformational leadership training intervention in the sample case). Dependent variable suggestions embedded in a case are typically aligned with but not necessarily limited to the original study. The sample case mentions branch managers' leadership skills at the end of the organizational context section. The subsequent section about Vice President Tamara Smith includes a narrative that alludes to relevant dependent variables inspired by Barling et al. (1996) – i.e., employee attitudes (satisfaction and commitment) and unit performance (credit card sales and personal loan sales).

Text Box 6. The Case Includes an Introduction
to the Substantive Topic (excerpted from Appendix C)

> "According to Dr. Arsenault, the leadership concept eludes a simple definition but is generally seen as an interpersonal influence process. '[T]he very best of organizational leadership is relational and inspirational, ethical, future-oriented, focused on employee development, and laden with the humility that characterizes great leaders' (Barling, 2014, p. 24). Transformational leadership has been a widely researched and influential theory over the past few decades (Barling, 2014). Drawing from various sources, Dr. Arsenault explained that transformational leaders demonstrate idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration."

The BUS 2880 practice is to include in a case (e.g., Appendix C) select citations and references that provide students with related background information such as a relevant meta-analysis (e.g., Wang et al., 2011), systematic review (e.g., Fischer & Sitkin, 2023), or research-based book (e.g., Barling, 2014) on the substantive topic(s) featured in the case. Those sources provide starting points for students' literature searches while demonstrating citation and referencing practices for students who are often new to academic writing. However, the

case References section (Appendix C) notes that not all sources used to create a case are listed because students are encouraged to search the academic literature themselves.

Encouraging Students' Literature Searches

The practice in BUS 2800 has been to *not* include a citation or reference to the primary source(s) used to develop a case (e.g., Barling et al., 1996). Instructors hope that students can uncover the primary source(s) of a case on their own. Such discoveries have sometimes yielded awe among the more dedicated student searchers about the information they can find via academic databases. Not all teams have located the primary study or used it to its full extent. Nevertheless, a solid research proposal can be built on course materials and literature other than the source article for the case. Still, curiosity (or envy) about how to find better sources has sometimes piqued when it became apparent that at least one team located a key source that eluded other teams (see The Competition section below). Teams have also varied considerably in the extent to which they have found other relevant sources. Sometimes, students' database searches have even uncovered relevant studies that a case's author(s) had not identified or prioritized.

Occasionally, having identified the source article for a case, panicked (and principled) students have expressed concern about avoiding possible academic misconduct given the similarity of a source to a case. Those instances have provided instructors with opportunities to better explain or remind students that properly citing their sources allows them to borrow from previous research. That can be an important lesson – as researchers, we are not only allowed but encouraged and expected to build upon existing knowledge. Realizing that they can build on a closely related, published study has occasionally given rise to displays of excitement that are, in our experience, rarely observed among research methods students.

Recent BUS 2880 cases have included more clues to signal that a thorough academic literature search may be fruitful. For example, a protagonist (either a manager or a professor) may allude to the existence of a relevant empirical investigation. In the sample case (Text Box 5 & Appendix C), the Vice President "vaguely recalls that, years ago, a Canadian banking executive was able to do a similar study through a partnership with university researchers." This content also aims to (further) discourage teams from restricting their searches to the general, non-scholarly web. As another subtle clue, in the *Transforming Leadership* case, citations to Barling's (2014) book reflect its use as a legitimate source of background information but also provide the name of a scholar whose program of research includes a directly relevant study (i.e., Barling et al., 1996).

The Task

BUS 2880 instructors have become increasingly transparent about the nature of the task facing students. Students had struggled too much with more subtle descriptions about what is expected of their teams. That led to some disappointing submissions featuring misguided research designs, last-minute scrambles to include a research design (after instructor consultations),

or no research proposal at all. The increased task transparency seems to represent another example of trying to find the right balance between challenging and supporting students. The project instructions (Appendix A) and case content (e.g., Appendix C) now make it clear that the major deliverable is a research proposal. Similar verbal instructions can also help.

Recently, BUS 2880 instructors added a page at the end of the project instructions with suggestions about proposal structure and content (see Appendix A). That information complements coverage of the structures of research proposals and research reports elsewhere in the course. It was initially used for additional support during a compressed summer offering in which the research proposal project was completed individually, with a peer feedback component (Joordens et al., 2009). Instructors in the subsequent regular course offering opted to keep the additional structure and content suggestions in place for teams.

Finding Field Experiments for Case Inspiration

One significant challenge has been finding appropriate source articles upon which to base our fictional cases. Field studies support the development of realistic cases. Ideally, the design and analyses involved in a source study are not overly complex (or convoluted) or are amenable to simplified variations. Importantly, BUS 2880 case authors have followed Dietz et al.'s (2014) lead by basing fictional cases on experimental or quasi-experimental studies. The Dietz et al. (2014) focus on producing causally interpretable local evidence is consistent with Pfeffer and Sutton's (2006, p. 70) advice for leaders to "treat the organization like an unfinished prototype and encourage trial programs, pilot studies, and experimentation…." That is, the design of BUS 2880 cases fosters an intervention-evaluation approach – encouraging students to outline plans to tinker and test systematically.

Identifying topics for which the evidence of intervention effectiveness is settled is difficult. Even well-respected perspectives are subject to renewed scrutiny (see the disclaimer at the beginning of Appendix C). Thankfully, completely settled science is not a prerequisite for using a topic in this context. In fact, it may be useful to demonstrate continued critical engagement with established ideas. A case protagonist can guide students in that respect. For example, a newer lens (e.g., Fischer & Sitkin, 2023) may be available to re-consider a replication and extension of a classic, highly cited study (e.g., Barling et al., 1996). Novice researchers are unlikely to delve too deeply into issues that experts in a field seem to struggle with and may disagree about, although students with more advanced research training (e.g., master's or Ph.D. students) might be more discerning. As the fictional professor points out in the sample case: "… ambiguity makes opportunities for intervention research in field settings especially important."

A Pre-Project Practice Case

Another example where protagonists seek to test hypothesized effects of a management practice is provided in *The Bike Messenger Case* (Dietz et al., 2014). BUS 2880 instructors have used a version of that case during class exercises in advance of the group project. Instructor debriefing notes, based on Dietz et al. (2014), include a summary of the research design used by the featured company and serve as a form of a worked example (Goodman & O'Brien, 2012) for students encountering a case-based research proposal for the first time. *The Bike Messenger Case* complements coverage of experimental design. Instructors can also re-consider that case in the context of other topics. When COVID-19-related restrictions required all UPEI courses to move online, BUS 2880 instructors introduced, and have since maintained even for principally in-person courses, an online discussion forum about *The Bike Messenger* practice case (and other class exercises). The practice case encourages students to try, in a low-stakes environment, the research-consultant role they must later assume for the research proposal project.

The Competition

The case-based research proposal project could be used with or without an explicit competition among teams. The BUS 2880 case competition was inspired by observations of substantial engagement and development among students on competitive, inter-university case competition teams, and the idea that similar competitions could be aligned explicitly with EBMgt (Gamble & Jelley, 2014). The students who represent our university at regional, national, or international case competitions are part of a selective program, not representative of all students in the mandatory business research methods course. Still, combining a realistic case stimulus, intragroup collaboration, and a moderate level of intergroup competition (for bonus marks) provides a relatively novel group project that engages students in a good-natured showcase of research design ideas. Recent meta-analytic research has found the combination of collaboration and competition to have some benefits on motivational and behavioural learning outcomes (Sailer & Homner, 2020).

Challenging Top Teams

The BUS 2880 case competition subjects finalists (i.e., the top three teams on the written submissions) to questioning about their research proposals by a panel of two or three judges, usually BUS 2880 instructors. Each course section has its own competition. Since all teams work on the same case, the final round provides a way for students – finalists and others – to consider and learn from the choices various teams made about the same case, reinforcing the idea that research design involves creativity as well as rigour. The final round challenges stronger teams – or at least their thought leaders – in ways they are unlikely to have experi-

enced in other second-year courses. Judges have also made clarifying statements as part of that debriefing process. Weaker teams have not been subjected to an equivalent line of questioning beyond private feedback conveyed with a team's project grade (based on Appendix B). The intention is not to humiliate students; instead, the competition aims to provide a constructive challenge for strong students and push them to defend their proposals in a friendly classroom environment. Also, with 8-11 teams in each course section, discussing the same case repeatedly could get boring for everyone.

In recent iterations of BUS 2880, instructors have given students access to all teams' proposals as part of a finalist-nomination process via online voting. That is a supplement to the traditional approach of having the course-section's instructor select finalists after reviewing all written submissions. The finalist-nomination process gives students the opportunity to consider a broader range of other teams' research proposals and, one would think, inspire teams to submit higher-quality work given its more public availability. Often, the top two teams are clear to the instructor and most peer nominators. Selecting a third finalist has regularly involved more nuanced analysis. Research design considerations (vs. writing quality) may be more heavily weighted for the purposes of finalist identification than for paper grading. The instructor retains responsibility for determining the finalist teams, but the peer nominations can be instructive in close situations.

The structure of the final round has involved a 10-minute question-and-answer session with each finalist team following either a 5- or 10-minute presentation – i.e., a total of 45 to 60 minutes within a 75-minute class meeting. Either schedule leaves time for judges' deliberations, an instructor's final notes about the competition, and other class business. The longer presentation time was used before the introduction of the finalist nomination process based on written submissions. With that process in place, instructors have tried having finalist teams do shorter initial presentations, in response to the *a priori* prompt provided in Text Box 7, to reduce finalists' workloads. Of course, the same prompt could be used with a longer presentation limit.

Text Box 7. Prompt for Finalist Teams' Opening Summary

> "We have read your research proposal along with those of the other teams. Please remind us about your proposal by describing the highlights of your research design, including key details such as what you propose to manipulate or measure."

Team and Individual Grades

A team's BUS 2880 project grade is based on the instructor's evaluation of the team's written submission. Finalist teams compete for bonus points – i.e., a project-grade increase of 5

(third place), 7.5 (second place), or 10 (first place) percentage points. Finalists are not graded specifically on their performance in the final round of the competition; instead, they compete for the size of the bonus. If the project is valued at 25% of the course grade, the first-place team has an extra 2.5/25 added to the grade on their written proposal. The stakes are meant to provide recognition for the top teams' work and the extra scrutiny they endure, without being overly worrisome to competitors. The instructions (Appendix A) now include an explicit project-grade limit of 100% (25/25), but instructors have not yet observed a ceiling effect. A few years ago, BUS 2880 instructors added an instructor option to cancel the case competition if too few high-quality (or moderate-quality) submissions are available. That option has rarely been exercised.

Although the project instructions (Appendix A) indicate that both nominations of finalists and within-team peer evaluations are required elements of the project, instructors may be more aggressive about ensuring student compliance with the latter. Occasionally, we have encountered problems with peer nominations (e.g., voting for a team number that did not exist) that suggest it is probably unwise to compel votes from those least likely to read others' proposals – i.e., adding random noise to the nomination process. Accountability within teams is important given that instructors consider peer evaluations when allocating individuals' grades, so efforts are taken to avoid missing within-team peer evaluations (e.g., reminders and penalties).

In BUS 2880, instructors may adjust individuals' project-grades based on peer evaluation feedback. Detailed discussions of team formation considerations (e.g., avoiding placing a lone female student on a team) and peer evaluation processes are beyond our current scope, but instructors have used web-based tools to facilitate those processes (e.g., O'Neill et al., 2019). Compatible schedules have been a key consideration when forming teams. Some instructors allow partner requests (i.e., dyads) as part of the instructor's process of forming 4-5-member student teams. BUS 2880 students have not been allowed to form their own teams entirely since that would provide too great an advantage to some teams composed of well-acquainted peers over others composed of strangers.

The Project Schedule

The project schedule for BUS 2880 is based on a semester with approximately 12 weeks of class time, not including the final examination period. The project instructions in Appendix A include, as examples, specific dates based on plans for a Winter (January-April) semester. The BUS 2880 project schedule has evolved over time. The instructor now releases the case and project instructions mid-to-late in the second month of the course. Instructors advise students to do preliminary, individual work so they are well-prepared to contribute to their soon-to-be formed teams.

Instructors tend to form teams near the university's course-discontinuation deadline

(i.e., end of the second month) to avoid assigning to teams any students who do not plan to complete the course. Initially, we provided a relatively short two-week period for the project, inspired by week-long case preparations used in some inter-university competitions. BUS 2880 instructors have since extended the time available for within-team collaboration – teams now have approximately 3-4 weeks to work together on the research proposal. There is usually at least one class session scheduled for instructor consultations with teams, in addition to ad-hoc consultations requested by students.

Following the project submission deadline, students are given a few days to read other teams' proposals and nominate those they think deserve a place in the final round. Students can nominate their own team if they think it is warranted. A choice poll allows instructors to see who voted for which teams, not only the vote counts. The instructor does a parallel review and (preliminary) grading of teams' research proposals. As noted previously, the instructor makes the ultimate decision about the finalists for their respective section(s). A section's instructor announces the finalists to the class via an online post and arranges for judges' access to finalists' research proposals a couple of days before the final round of the competition. Around that time, the instructor will typically give teams approximately one week to complete within-team peer evaluations (e.g., O'Neill et al., 2019) that are used to help finalize individual grades.

Student Learning via the Project: A Fresh Perspective

This project has not been formally evaluated but Dr. Scott Cassidy, a junior tenure-track faculty member at UPEI, shared his perceptions of the project and its effects on students for this chapter. Dr. Cassidy taught one course section of BUS 2880 in Fall 2022 and served as a judge for the other two sections that semester. Jelley and Cassidy co-authored the case used in Fall 2022 – a goal setting quasi-experimental research opportunity set in the food delivery sector. The Winter 2023 semester was in progress when Dr. Cassidy wrote the following commentary; Winter 2023 teams had not yet submitted research proposals about that semester's case. Dr. Cassidy determined the length of commentary that he felt was appropriate. Dr. Cassidy had not read any portion of this chapter when he provided his commentary.

> Request to Dr. Cassidy: "As a new BUS 2880 instructor, please provide your thoughts about the case-based research proposal group project, especially the extent to which it may have contributed to students' learning."
>
> Response:
>
> *"'We hope it is of the highest quality, and I think I can accurately speak for the group when I say this was a tremendous source of hardship, as well as learning.'*

Those were the words that accompanied one group's submission during my first iteration of BUS 2880. They needn't have worried about the former. Their research proposal was indeed of the highest quality; and ultimately, they won that semester's case competition.

The latter statement really stood out to me, however; and captured what I believe many students experience while completing this project. It was early into my first semester teaching BUS 2880 when I learned it has a reputation among our Bachelor of Business Administration (BBA) students for being among the most difficult courses required for graduation… and one that many approach with trepidation. So, it came as no surprise that the research proposal project – a culmination of the course's individual learning modules – proved to be a source of hardship for most. However, for those who sufficiently understood the modules and who embraced the opportunity to consider their interplay, I found that the project also provided a unique opportunity to internalize some of the course's key 'takeaways,' while also providing recognition and confidence-building for those who rose to the occasion.

One key learning that I try to emphasize when teaching BUS 2880 is that no single form of evidence is perfect. Indeed, the effective and responsible generation, dissemination, and consumption of empirical evidence requires careful – if at times, subjective – decision-making about what constitutes appropriate research design, measurement, and analysis (each of which must not only be robust, but also realistic within the practical constraints of one's research project). During our lectures, my students learn the advantages and disadvantages of different study designs, sampling strategies, and measurement approaches; and will often try to memorize the resulting 'lists' for each of these in preparation for the course's tests. However, I believe that sheer memorization of each component in isolation does not encourage students to truly understand the decision-making process involved in research; and thus, would fail to meet this learning outcome in isolation.

Conversely, I've found that the research proposal *does* encourage a more holistic understanding and integration of content, for a few reasons. First, the proposal is generative – and requires students to connect disparate course concepts to produce their own solution to a research problem (presented in the form of a case). Writing the proposal requires students to go beyond memorizing lists of "pros and cons." Instead, they must match different sampling approaches, variable operationalizations, etc. to their research design; and determine how to analyze and draw conclusions from the data that would result from such a design. This process not only requires students to explore the connections between course topics, but does so using a higher level of cognitive complexity, as per Bloom's taxonomy (i.e., moving beyond the "Remembering," "Understanding," and "Applying" levels addressed in the course tests – and towards the "Analyzing," "Evaluating," and "Creating" levels).

Second, although there are research strategies that more effectively match the constraints presented in the case, there is no one single correct solution. I found that the need to engage in informed – but ultimately subjective – decision-making (and then justify the decisions made) further challenged my students to revisit what they had learned factually. Through applying various topics to the case, only to find that some "best practices" were not realistic (e.g., knowing that a true experiment would improve the ability to make causal inferences; however, also realizing that the case scenario made such a design impractical), my students came to understand the limitations of research evidence in practice – and why evidence must be interpreted critically, given the imperfect foundations upon which it rests. An assignment that simulates the process of making the subjective decisions – and compromises – required in applied research was, in my opinion, the more effective way of teaching them this lesson.

This, however, is a lofty goal. Not every student – or every group – reached this level of comprehension in my class. Indeed, I don't believe

that the project necessarily adds pedagogical value for every student; or is necessarily tailored to "the average undergraduate." Rather, I feel it serves an important discriminative function; and helps to differentiate those who have learned to think about and integrate the nuances of research and evidence-based practice from those who have just learned about individual research topics (and gives the former additional recognition and a chance to demonstrate and share their newfound comprehension with the larger class).

Moreover, for the students who *do* reach this level and learn to embrace and work through the 'hardship' of research design, I feel the project not only helps them feel seen and recognized for their achievement… but can be genuinely transformative. The 'case competition' is a visible award of merit for the highest-performing groups; and in my Fall 2022 section, the individual recognition, attention, and encouragement this fostered for the winning group bolstered the students' confidence enough that two of them expressed a further interest in joining the McDougall Faculty of Business' case competition team. I also had a student from another of the finalist groups approach me after the semester ended to express their gratitude and explain how the course had genuinely changed their worldview (encouraging them to view claims in everything from politics to advertising with a greater degree of skepticism and critical reflection). And although their feedback did not reference the proposal project specifically, I do believe that it played a substantive role in encouraging this student (and others in the class) to more thoughtfully evaluate the foundations upon which knowledge and evidence are generated."

Commentary by Dr. Scott Cassidy, UPEI McDougall Faculty of Business

Future Considerations

Adapting ideas from Dietz et al. (2014) and Gamble and Jelley (2014), we have worked with our colleagues to run a research proposal case competition in undergraduate business research methods courses since Fall 2015. In addition to those previously noted, BUS 2880 instructors have made other modifications to the project over time such as further diversifying case

protagonists (beyond never having featured two men) and updating trends in communication technology (i.e., a telephone call has become a virtual meeting). There are other possibilities BUS 2880 instructors continue to consider while keeping workloads manageable.

Searching databases for topical case ideas investigated via field experiments or quasi-experiments in organizations is plausible, but often frustrating. It will become easier to find field experiments on organizational interventions if researchers continue to build on recent intervention-research momentum (Lambert et al., 2022). Lambert et al. (2022) credited EBMgt for the massive increase they observed in intervention research in the management field since 2011 compared to previous decades (see their Figure 1). The sources cited and themes identified in Lambert et al. (2022), plus examples in Dietz et al. (2014) and Goodman and O'Brien (2012), are likely to be useful to future case writers.

The approach adopted for BUS 2880 is less extensive than comprehensive approaches involving multiple cases or case-project combinations for repeated practice within a given course (e.g., Dietz et al., 2014; Goodman & O'Brien, 2012). Though BUS 2880 was not designed as a course to "weed out" students and its failure rate is not especially high, Dr. Cassidy's observation that it has earned a reputation as a difficult course reinforces our hesitation to further increase its student (or instructor) workload (e.g., by assigning multiple case projects).

We concur with Dr. Cassidy's comment about the uneven benefits students seem to receive from the project. Similarly, the extent of collaboration within teams can vary considerably. BUS 2880 instructors have warned teams to avoid assigning, for example, members of a four-student team to address each of the four EBMgt elements (Briner et al., 2009) separately. Yet, that strategy and other dysfunctional ideas (e.g., have one student paraphrase the case but not fully participate in literature search or research design) seem to persist in some teams. An informal pilot test assigning the project on an individual basis, with a peer feedback element (Joordens et al., 2009), reflected both our desire to enhance individual accountability and team-related logistical difficulties encountered during compressed (6-week) summer sessions. The confound of timeframe (regular semester vs. compressed summer session) and project format (team vs. individual) makes it unwise to make firm attributions from that trial (e.g., explaining a seemingly high proportion of academic misconduct cases among individual submissions). Still, we are hesitant to abandon the use of intrateam collaboration to support students' learning and quality control of submissions (e.g., pre-submission plagiarism interventions by team members). Students are encouraged to begin project work individually in order to be prepared for collaborative work with teammates. Compliance with that preparatory advice has been disappointing but not surprising. There is a possibility of introducing an individual-level, preliminary deliverable regarding the semester's assigned case. Also, peer evaluations have potential to enhance team member effectiveness beyond the single, end-of-project accountability assessments we have deployed to date (e.g., adding a developmental assessment and debriefing during the semester; O'Neill et al., 2019).

Generative AI tools such as ChatGPT are starting to be integrated in educational experiences rather than instructors taking a policing approach to restrict their use (e.g., Naidoo, 2023). Those tools could make an individual-level, pre-team deliverable reasonable from a workload perspective. For example, each student could be asked to develop a succinct research proposal for the semester's project case. As part of that process, students could be allowed or encouraged to try a tool like ChatGPT to help get them started. One cursory trial of ChatGPT involved a simple copy-and-paste of a case for ChatGPT's consideration. The result may have included some incorrect or suboptimal content but, as Dr. Cassidy observed in a separate comment from those already offered in this chapter, "I've seen worse" (from student teams). In any event, instructors will need to consider tools like ChatGPT going forward. Having individual students check and refine ChatGPT's preliminary suggestions, and collaboratively integrate team members' early work, might be a manageable and educational way to modify the project to encourage better contributions from all team members. Advances in AI may also facilitate literature searching for students, instructors, and researchers.

Beyond a course context, Gamble and Jelley (2014) proposed an inter-university EBMgt case competition that remains a possibility to explore. The research proposal adaptation seems appropriate for our research methods course, but EBMgt-inspired case analysis need not be limited to crafting plans to collect data (see, for example, Dietz et al., 2014; Gamble & Jelley, 2014; Goodman & O'Brien, 2012). Still, the strategy illustrated herein for creating cases could be used with more advanced students working in shorter case-preparation periods, possibly including a research proposal element as one phase of an inter-university EBMgt case competition. Other adaptations for graduate students are noted briefly in the next section.

Adaptations in an Executive MBA Program

The UPEI EMBA program has included variations on the case competition used at the undergraduate level. The first example comes from a business research methods course (BUS 6080) that students complete relatively early in the EMBA program. BUS 2880 was based on that graduate-course cousin, but the undergraduate version also contributed to BUS 6080's eventual inclusion of a research proposal case competition. At the end of the EMBA program, two of three segments of the EMBA Capstone Course have also come to involve EBMgt case competitions. We provide more detail on these and other efforts to integrate EBMgt into our EMBA program in Saksida and Jelley (2024) in this book.

Conclusion

We are happy to share our experiences using a case-based research proposal competition at the undergraduate level for other EBMgt instructors to consider, refine, and apply. These

efforts are a continual work-in-progress. Future BUS 2880 instructors, and instructors at other institutions, will likely develop innovations to enhance the practices outlined in this chapter. Case-based research proposals and related projects are only one element of our attempts to support the development and refinement of an EBMgt mindset among our students. We are grateful that the Center for Evidence-Based Management has compiled this collection of contributions to encourage further sharing and refinement of EBMgt teaching ideas.

References

Barends, E., Rousseau, D. M., & Briner, R. B. (2014). *Evidence-based management: The basic principles*. Center for Evidence-Based Management. https://www.cebma.org/wp-content/uploads/Evidence-Based-Practice-The-Basic-Principles-vs-Dec-2015.pdf

Barends, E., Rousseau, D.M. & Briner, R.B. (Eds). (2017a). *CEBMa guideline for critically appraised topics in management and organizations, version 1.1*. Center for Evidence-Based Management. https://www.cebma.org/wp-content/uploads/CEBMa-CAT-Guidelines.pdf

Barends, E., Rousseau, D.M. & Briner, R.B. (Eds). (2017b). *CEBMa guideline for rapid evidence assessments in management and organizations, version 1.0*. Center for Evidence-Based Management. https://cebma.org/wp-content/uploads/CEBMa-REA-Guideline.pdf

Barling, J. (2014). *The science of leadership: Lessons from research for organizational leaders*. Oxford.

Barling, J., Weber, T., & Kelloway, E. K. (1996). Effects of transformational leadership training on attitudinal and financial outcomes: A field experiment. *Journal of Applied Psychology*, *81*(6), 827-832.

Bougie, R., & Sekaran, U. (2020). *Research methods for business: A skill-building approach (8th ed.)*. John Wiley & Sons Ltd.

Briner, R. B., Denyer, D., & Rousseau, D. M. (2009). Evidence-based management: Concept cleanup time? *Academy of Management Perspectives*, *23*, 19-32.

Briner, R. B., & Rousseau, D. M. (2011). Evidence-based I–O psychology: Not there yet. *Industrial and Organizational Psychology*, *4*, 3-22.

Center for Evidence-Based Management (2020, May). *Attributes of effective virtual teams: Rapid evidence assessment of scientific literature* [Technical report]. Center for Evidence-Based Management and Chartered Institute of Personnel and Development. https://www.cipd.co.uk/virtualteams

Dietz, J., Antonakis, J., Hoffrage, U., Krings, F., Marewski, J. N., & Zehnder, C. (2014). Teaching evidence-based management with a focus on producing local evidence. *Academy of Management Learning & Education, 13*(3), 397-414.

Financial Consumer Agency of Canada (2018, March 20). *Domestic bank retail sales practices review*. https://www.canada.ca/en/financial-consumer-agency/programs/research/bank-sales-practices.html

Fischer, T., & Sitkin, S. B. (2023). Leadership styles: A comprehensive assessment and way forward. *Academy of Management Annals*, *17*(1), 331-372.

Gamble, E. N., & Jelley, R. B. (2014). The case for competition: Learning about evidence-based management through case competition. *Academy of Management Learning & Education*, *13*(3), 433-445.

Goodman, J. S., & O'Brien, J. (2012). Teaching and learning using evidence-based principles. In D. M. Rousseau (Ed.), *The Oxford Handbook of Evidence-Based Management* (pp. 309-336). Oxford University Press.

Jelley, R. B. (2021). Using personality feedback for work-related development and performance improvement: A rapid evidence assessment [Special issue]. *Canadian Journal of Behavioural Science, 53*(2), 175-186.

Jelley, R. B., Carroll, W. R., & Rousseau, D. M. (2012). Reflections on teaching evidence-based management. In D. M. Roousseau (Ed.), *The Oxford Handbook of Evidence-Based Management* (pp. 337-355). Oxford University Press.

Johnson, E. (2021, February 11). *Employees' claims of sales pressure spark shareholder lawsuit against TD Bank*. Canadian Broadcasting Corporation. https://www.cbc.ca/news/canada/td-class-action-upselling-1.5909176

Joordens, S., Desa, S., & Paré, D. E. (2009). The pedogical anotaomy of a peer-assessment: Dissecting a peerScholar assignment. *Systemics, Cybernetics and Informatics*, *7*(5), 11-15.

Lambert, B., Caza, B. B., Trinh, E., & Ashford, S. (2022). Individual-centered interventions: Identifying what, how, and why interventions work in organizational contexts. *Academy of Management Annals*, *16*(2), 508-546.

Mesny, A. (2013). Taking stock of the century-long utilization of the case method in management education. *Canadian Journal of Administrative Sciences, 30*(1), 56-66.

Naidoo, L. J. (2023). ChatGPT shakes up I-O psych education [Max. Classroom Capacity column]. *The Industrial and Organizational Psychologist*, 60(4) https://www.siop.org/Research-Publications/Items-of-Interest/ArtMID/19366/ArticleID/7457/preview/true/Max-Classroom-Capacity-ChatGPT-Shakes-Up-I-O-Psych-Education%E2%80%A6

O'Neill, T., & Jelley, R. B. (2014). Integrating practical experience in I/O courses. *The Industrial-Organizational Psychologist*, *52*(1), 142-153. http://www.siop.org/tip/july14/pdfs/oneill.pdf

O'Neill, T., Larson, N., Smith, J., Donia, M., Deng, C., Rosehart, W., & Brennan, R. (2019). Introducing a scalable peer feedback system for learning teams. *Assessment & Evaluation in Higher Education*, *44*(6), 848-862.

Pfeffer, J., & Sutton, R. I. (2006). Evidence-based management. *Harvard Business Review*, *84*(1), 62–74.

Rousseau, D. M. (2006). Is there such a thing as "evidence-based management?" *Academy of Management Review*, *31*(2), 256-269.

Rousseau, D.M., Manning, J. & Denyer, D. (2008) Evidence in management and organizational science: Assembling the field's full weight of scientific knowledge through syntheses. *The Academy of Management Annals*, *2*, 475–515.

Rousseau, D. M., & McCarthy, S. (2007). Educating managers from an evidence-based perspective. *Academy of Management Learning & Education, 6*(1), 84-101.

Rubin, R. S., & Dierdorff, E. C. (2009). How relevant is the MBA? Assessing the alignment of required curricula and required managerial competencies. *Academy of Management Learning & Education*, *8*(2), 208-224.

Saksida, T., & Jelley, R. B. (2018). A decade of teaching evidence-based management: Initiatives and future directions. *Workplace Review, April,* 103-120. https://www.smu.ca/webfiles/April2018.pdf

Saksida, T., & Jelley, R. B. (2024). Teaching Evidence-Based Management at the University of Prince Edward Island: Reflections On the first 15 years. In C.Gubbins, D.M. Rousseau and A. Capezio (eds), *CEBMa Handbook of Evidence-based Management Teaching. CEBM*a: Leiden.

Sailer, M., & Homner, L. (2020). The gamification of learning: A meta-analysis. *Educational Psychology Review*, *32*, 77-112.

Wang, G., Oh, I. S., Courtright, S. H., & Colbert, A. E. (2011). Transformational leadership and performance across criteria and levels: A meta-analytic review of 25 years of research. *Group & Organization Management*, *36*(2), 223-270.

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The authors thank Dr. Joerg Dietz, University of Lausanne, for sharing sample cases that provide the template we have used to create cases for our undergraduate students' research proposal projects. The sample case shown herein, with Dr. Dietz's permission, is an adaptation of the Dietz approach and structure using content that we chose.

We thank our UPEI colleague Dr. Scott Cassidy for providing within this chapter his perspective about student learning via the case-based research proposals project with undergraduate students.

Please address correspondence concerning this chapter to R. Blake Jelley, McDougall Faculty of Business, University of Prince Edward Island, 550 University Avenue, Charlottetown, PE C1A 4P3. Email: bjelley@upei.ca.

Appendix A

Business 2880 Research Proposal Instructions for the Case Competition

Sample 2023

Competition Overview

Your instructor will form teams within your section of BUS 2880. Each team will analyze the same case and submit a *research proposal* (paper) by the deadline (see Schedule below). After the work is submitted, you will be responsible for providing peer assessments of the other teams' work. Through those peer assessments, the students in the class will help identify the finalists who will participate in a Question-and-Answer session with the instructor (and possibly other judges) for *extra marks*.

Considering finalists' additional efforts to prepare for and participate in the Question-and-Answer session, those teams will receive extra marks on the assignment grade (i.e., +5% for 3rd place, +7.5% for 2nd place, +10% for 1st place – to a maximum 100% of the assignment grade). The instructor reserves the right to cancel the competition if there are too few high-quality submissions.

The instructor will grade each team's report (valued at 25% of the course grade), apply finalists' extra marks to the assignment grade, and make any necessary adjustments to individual grades.

Peer evaluations within each team may be used to adjust individual team members' grades to reflect member contributions fairly. The team case competition is worth 25% of your grade in BUS 2880. You are responsible for making contributions to your team. If you fail to contribute to your team's work or your contributions are inadequate, your individual grade will be reduced (with the lowest possible grade being 0/25).

You are responsible for providing fair, constructive peer assessments of other teams' work and peer evaluations of your teammates' contributions. Your individual project grade can be *reduced by up to 10 percentage points* if you do not complete the peer assessments (of other teams' work) and peer evaluations (of contributions within your team).

Assignment: Prepare a Research Proposal based on a Case

Preparing a research proposal involves providing a rationale for a proposed study and outlining, in detail, how it will be conducted. Creating a proposal can help clarify the researcher's thinking. Research proposals also communicate the plan to others. Researchers may need to submit proposals to gain the permission(s) (e.g., ethics, organizational access) and funding (e.g., research grant, consulting contract) that may be necessary to conduct a study.

A research proposal assignment is an excellent way to learn about research methods without investing the time and expense required to complete a study. It is a practical starting point for training new researchers and learning to appreciate and critique others' research. However, coming up with an idea can be challenging. Which topic area will you investigate? How can you make a specific contribution? Those can be tough questions for a new researcher (or team of new researchers) to answer.

The BUS 2880 research proposal assignment removes the burden of choosing a topic by *presenting a research opportunity via a short case*. The case contains information about the topic of interest, hints about relevant literature to search, and parameters for an appropriate study. Students focus on the methodological (i.e., design, measurement, and analysis) choices they learn about in this introductory research methods course.

An Evidence-Based Approach to Cases and Applied Problems

This research proposal project is compatible with an evidence-based approach to case analysis. The evidence-based management (EBMgt) framework (e.g., Barends et al., 2014; Briner et al., 2009; Briner & Rousseau, 2011) includes critical reflection on each of the following main components: ethics and stakeholder concerns, practitioner judgement and expertise, local data and experimentation, and principles and evidence derived from formal research ("scientific" or alternative approaches). This broad framework can be used to help analyze case studies and applied problems in any domain (Gamble & Jelley, 2014). For BUS 2880, there are opportunities to apply your knowledge of research methods within this broad framework. Examples of general use of the framework and BUS 2880-specific ideas follow.

- Ethics and stakeholder concerns: Are there legal, moral, or values-based concerns to consider? Have you considered the concerns of everybody who might be affected by a decision?
- Practitioner judgment and expertise: Do you (or does a protagonist in a case) have experience dealing with issues like those presented? How relevant is that experience in the present circumstances? How much trust can you place in any (alleged) "expertise?"
    - For a BUS 2880 case, you would typically consider this component from the perspective of the people described in the case (vs. your personal experience). The key idea is that all EBMgt elements, including this one, are both respected and considered critically.
- Formal research: To what extent do existing theories, principles, and research evidence provide perspective on the situation – e.g., its potential causes, consequences, and intervention strategies? How strong and relevant is the existing knowledge?
    - In BUS 2880, we expect *students to conduct academic literature searches*, using skills refined in the course, to find high-quality, relevant evidence to inform analysis and recommendations.
    - Can you adapt procedures or measures from previous studies (appropriately cited) to design your study?
- Local data and experimentation: What evidence exists in the organization that is relevant to your deliberations? What is the quality of that evidence? What additional evidence is needed? *How could you conduct a study to gather such evidence?*
    - A BUS 2880 case may include information or statistics from analyses of internal data, but not datasets that you must analyze statistically.
    - For a BUS 2880 case, you will need to *propose a research project* to gather required information, outlining relevant details of your proposed research. Data collection is NOT part of the BUS 2880 case project.

Considering all four EBMgt elements does not imply that they deserve equal space in your paper. A research proposal should prioritize insights from formal research and your primary data collection plans.

Deliverable: The Research Proposal

The body of the text should be **8-10 double-spaced pages**. The title page, executive summary (or abstract), references, and appendices (e.g., table(s) summarizing evidence, interview protocols, questionnaires) do not count toward the page limit. Please follow APA style for formatting, citations, and references. The composition should be a concise, eloquent communication of your work. Work diligently to craft a well-written, carefully edited paper (i.e., professional quality). Use Grammarly for advice and edit carefully to polish your work before submission. Try reading your composition out loud as one of your last proofreading steps. Work as a team to craft a well-written, professional document.

Every team member should be involved in each aspect of the project (e.g., literature searching, research design planning) and preparation of the deliverable (i.e., writing and editing). DO NOT assign different sections to different team members to do independently.

Please see the final page of these instructions for ideas about content and structure of a research proposal.

2880 Project Schedule	**Winter 2022* Example**
Case released	After Test 2 (Late February)
Submission (PDF research proposal)	No later than NOON on March 30
Peer assessments (of other teams' proposals)	April 2 by NOON
Finalists announced	April 3
Finalists' Question-and-Answer session with judges	April 5 (all students must attend)
Peer evaluations (within your own team)	No later than April 10

* Fall 2022 and Winter 2023 schedules were atypical due to major events.

References

Barends, E., Rousseau, D. M., & Briner, R. B. (2014). *Evidence-based management: The basic principles*. Amsterdam: Center for Evidence-Based Management.

Briner, R. B., Denyer, D., & Rousseau, D. M. (2009). Evidence-based management: Concept cleanup time? *Academy of Management Perspectives*, *23*, 19-32.

Briner, R. B., & Rousseau, D. M. (2011). Evidence-based I–O psychology: Not there yet. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, *4*(1), 3-22.

Gamble, E. N., & Jelley, R. B. (2014). The case for competition: Learning about evidence-based management through case competition. *Academy of Management Learning & Education*, *13*(3), 433-445.

You and your teammates will need to decide how best to structure your paper and its elements. The text should flow logically. Using sections and subsections can help (apply APA levels of heading). Your research proposal should…

Use your Project Title to label the introduction section

Include a succinct description of the background, organizational context, and research opportunity. You can *paraphrase* the assigned case information without citing the case author (usually the course instructor).

Consider practitioner judgement and expertise (e.g., experience and perspectives of key case protagonists, especially a decision-maker).

Consider any ethics and stakeholder concerns (e.g., business ethics & research ethics).

Summarize considerations from a review of academic (i.e., peer-reviewed) literature (e.g., description(s) of the key construct(s), critical appraisal of relevant findings from previous research, intervention strategies, methodological approaches, or measures used in previous studies).

Specify the purpose of the study (e.g., purpose statement, study scope, specific hypotheses or research questions).

Method

Describe the nature of the sample (i.e., based on the organization in the case).

Outline a research design appropriate to the research opportunity presented in the case (e.g., experimental manipulation of an independent variable in a case focused on cause-effect testing of a product, service, or procedure).

Specify, in detail, the variables involved in the study (e.g., measures, manipulations).

Outline the procedures for how you would conduct the proposed research.

Expected Results

Provide thoughts about how the data would be analyzed (i.e., be sure the proposed research could provide data that can serve the study's purpose).

Outline the expected findings from the study.

Discussion

Explain how the proposed study can be expected to make contribution(s) (e.g., to organizational decision-making, the formal research knowledge base, or both). Implications?

Acknowledge limitations of the research design.

References

Provide a list of all sources you consulted and cited in the paper.

Comply with APA formatting (including but not limited to Reference list formatting).

Tables, Figures, Appendices

Include any additional resources (e.g., draft questionnaires or protocols) after the References section.

Appendix B

Bus 2880 – Research and Evidence-Based Management
Case Competition: Team Report

	Description	Team project report grade[1]
Title page	Paper title; instructor name; team number; authors (in alphabetical order by surname); date	
Executive summary	This 1-page summary is an overview of the entire report, providing a clear and concise synopsis of the main issues and recommendations.	/10
Description of the situation	The team provides a thorough yet concise description of the situation facing the organization. The team identifies the problem(s) facing the organization and individuals involved.	/15
Use of the EBMgt framework (please note that not all the elements may be applicable to a specific case)	Includes relevant evidence, principles, perspectives, models, and/or theories based on existing formal research (search and critical review of academic literature and possibly other sources such as industry studies or government reports).	/30
	Interprets local evidence that may be presented in the case (e.g., administrative records, survey results, qualitative studies, experiments). May propose a research study to gather relevant evidence (see also Recommendations)	
	Effectively considers ethics and stakeholder concerns applicable to the case. Balances respect for and critical consideration of experience, expertise, and opinions that may be presented for case protagonist(s).	
Recommendations and specific action plans	The team provides case-appropriate recommendations using supporting rationales rooted in evidence, which may include conducting additional research. Any research proposal should include details on the design, measurement, proposed analyses, and anticipated contributions to decision-making.	/25
Grammar and formatting	The team report is free from grammatical and mechanical errors (e.g., spelling, capitalization, punctuation). The report follows the formatting instructions (see below) and the organization and structure of the paper is carefully planned. The team uses thoughtful, energetic prose.	/20
References	Teams must provide appropriate citations for both in-text citations and references (using APA style). Verbatim quotes are properly attributed and used sparingly.	
Report total		/100
Project value[1]	Finalists' bonus marks based on the Q&A session will be added to the total project grade (bonus percentage points added to the project grade out of 100)	/25

[1] Please note that your individual mark on the team project will be based on the total points earned by your team and the peer allocations of marks among team members (based on peer evaluations).

Notes:

Please refer to the Case Competition Instructions on Moodle. The instructions include information about the extra marks for case competition finalists as well as possible individual grade reductions.

The final project report should be 8-10 typed, double-spaced, and numbered pages of text. The title page, executive summary, references, and any appendices are NOT included in the page limit. Use APA style for formatting, citations, references, and other matters of writing style.

The paper must have one-inch margins on letter size (8.5”x11”) pages, preferably using 12-pt Times New Roman font (or another option recognized in the 7th edition of the *Publication Manual of the American Psychological Association*).

Be sure to complete the Effective and Responsible Use of Literature ERUL unit (and Quiz) before submitting your report. Attend to the ERUL Quiz deadline.

Appendix C

Transforming Leadership at Big Bank

R. Blake Jelley, UPEI McDougall Faculty of Business

Fictional case. Approach and structure adapted from J. Dietz (2013), University of Lausanne. Content inspired by theory and research on transformational leadership, and sector-specific information. This case draws upon previous cases by Jelley, Saksida, and Cassidy for BUS 2880.

A note like the one in the preceding paragraph is a standard component of our BUS 2880 cases. For this chapter, we adapted a case used in Winter 2021. Along with some minor changes, we added some cautions about transformational leadership, and leadership research generally, that were not featured in the original case. We thank Dr. Joerg Dietz for permission to publish this sample case based on the Dietz approach and structure, and for sharing thoughtful concerns about the evidence-base underlying transformational leadership that inspired refinements to this sample case (e.g., the Fischer & Sitkin, 2023 citation and reference).

Overview

Dr. J. P. Arsenault could hardly contain her excitement! The professor had just finished a virtual meeting with Tamara Smith, a Regional Vice-President of Big Bank. Ms. Smith told Dr. Arsenault that she would allow the professor's team to design a field experiment to test aspects of transformational leadership theory in exchange for helping the company with its leadership development efforts in her region.

Such opportunities are rare, and as an emerging leadership scholar, Arsenault could not help but be excited about this opportunity. Soon, however, Dr. Arsenault's excitement turned into tension. Her Business 2880 students now had to develop a research proposal for a field experiment that satisfied both her high academic standards and the company's business objectives.

The Canadian Banking Industry

The major Canadian banks are among the world's largest banks in market capitalization and hold trillions of dollars in assets (Norrestad, 2021; Statista, n.d.). They are also large in terms of the number of people they employ. The two largest Canadian banks each had well over 80,000 employees in 2020 (Statista, n.d.).

The Canadian Banker's Association reported 5,890 bank branches in Canada in 2018, down from 6,350 branches in 2014 (Statista, n.d.). Despite a recent decline in number, likely due to increased internet banking options, branches remain an essential part of Canadian retail banking. That may reflect the value customers place on personal contact with their financial services provider (Norrestad, 2021).

A survey by J. D. Power between June 2019 and January 2020 of more than 15,000 retail banking customers, aged 18-40 years, showed similar customer satisfaction ratings for the major Canadian banks, with company averages ranging from 782 to 794 on J.D. Power's 0 to 1,000 scale (mean = 788; Statista, n.d.). The banks compete to provide satisfying customer experiences. There is little room for error in such a competitive environment.

Big Bank, Region "O"

Big Bank is a fictional Canadian Bank – an imaginary sixth addition to the big five banks. Tamara Smith is the Vice-President of Big Bank responsible for Region "O." That region has 30 branches, each with 25 to 50 employees. Each branch manager is responsible for the operation of that location, its employees, and the customer experience. Branch managers have 9-12 direct reports – employees who report directly to the branch manager. The branches are separated by

geography and operate independently within the rules of Big Bank and guidance from their Vice-President. Vice-President Smith would like to improve her branch managers' leadership skills.

Vice-President Tamara Smith

Tamara Smith started her banking career as a co-op student while completing her undergraduate degree in business. She has spent the past 22 years excelling in progressively responsible positions. Ms. Smith has taken advantage of Big Bank's various training programs in finance, banking, and administrative operations (but not leadership per se). Ms. Smith is widely respected within Big Bank and the industry as a smart, inspirational, approachable, ethical, and humble leader. Ms. Smith contends that leaders can affect their employees and unit results, albeit indirectly at times. She recognizes that some key performance indicators are difficult for branch employees to change. Still, things like credit card sales and personal loan sales can be affected (ethically) by employees' efforts if their leaders inspire them. Ms. Smith has always discouraged the unethical sales practices that have caused public relations and legal problems in recent years for at least one major competitor. Smith prioritizes employee satisfaction and wants to instill a commitment to and pride in being a Big Bank employee.

Although she is skeptical about leadership training, Smith sees the partnership with Dr. Arsenault's students as a chance to improve employees' work attitudes and branch performance indicators. Ms. Smith vaguely recalls that, years ago, a Canadian banking executive was able to do a similar study through a partnership with university researchers. The Vice President also suspects that a convincing demonstration about the effectiveness of leadership training in Region "O" could have implications for the rest of Big Bank, and for her upwardly mobile career.

Assistant Professor Arsenault

J. P. Arsenault has an emerging record of leadership research. She secured a tenure-track position after completing her Ph.D. in management and is currently an Assistant Professor. Dr. Arsenault is well-versed in the leadership literature, having completed her comprehensive examination just a few years ago. She is a member of several committees on campus and serves as a mentor for her students. Professor Arsenault has not held a formal managerial position.

Transformational Leadership

According to Dr. Arsenault, the leadership concept eludes a simple definition but is generally seen as an interpersonal influence process. "[T]he very best of organizational leadership is relational and inspirational, ethical, future-oriented, focused on employee development, and laden with the humility that characterizes great leaders" (Barling, 2014, p. 24). Transformational leadership has been a widely researched and influential theory over the past few decades (Barling, 2014). Drawing from various sources, Dr. Arsenault explained that transformational leaders demonstrate idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration.

Based on their meta-analysis of 25 years of research, Wang et al. (2011) concluded that transformational leadership has been associated with superior performance among individuals, teams, and organizations. Transformational leadership has correlated favourably with employee attitudes (e.g., job satisfaction, affective commitment, fairness perceptions, and trust in the leader), work performance, unit outcomes, and stress indicators (Barling, 2014).

However, Dr. Arsenault is well-aware of criticisms about the quality of research on transformational leadership and other major leadership styles (e.g., Fischer & Sitkin, 2023). She does not believe the science is settled – cause-effect relations are usually equivocal in this domain. The professor thinks that ambiguity makes opportunities for intervention research in field settings especially important.

The Task

Dr. Arsenault and Ms. Smith discussed the extent to which leadership generally and transformational leadership specifically can be trained and developed. Their conversation was a sophisticated version of the debate about whether leaders are born or made. Arsenault pointed to formal research on genetic influences as well as early environmental factors that affect leadership. Smith shared stories of people for whom leadership behaviours came easily and those for whom leadership seemed less natural. However, both Arsenault and Smith were intrigued by the idea of developing transformational leadership skills among branch managers and the implications that a deliberate leadership development intervention could have for employee attitudes and unit performance.

Dr. Arsenault knows that her students have a unique opportunity – one they cannot afford to mess up. Her team has a chance to investigate, in a field setting, whether transformational leadership training can have beneficial effects. Furthermore, the research team needs to think about the concerns of Big Bank, its managers, and employees. Finally, as a scientist (and with an eye on producing a top-level research paper), the professor wants to make sure that she and her team can draw defensible causal inferences, which is typically a challenge in field studies. Dr. Arsenault assigns her research team to learn about transformational leadership and its development, and to design an experiment with these thoughts in mind. Dr. Arsenault and Ms. Smith are expecting the team's proposal by the deadline.

You are that research team – good luck!

References

Barling, J. (2014). *The science of leadership: Lessons from research for organizational leaders*. Oxford.

Fischer, T., & Sitkin, S. B. (2023). Leadership styles: A comprehensive assessment and way forward. *Academy of Management Annals*, *17*(1), 331-372.

Norrestad, F. (2021, February 3). *Canadian banking industry – Statistics & facts*. Statista. Retrieved February 10, 2021 from https://statista.com/

Statista (n.d.). *Banking industry in Canada*. Statista. Retrieved February 10, 2021 from https://statista.com/

Wang, G., Oh, I. S., Courtright, S. H., & Colbert, A. E. (2011). Transformational leadership and performance across criteria and levels: A meta-analytic review of 25 years of research. *Group & Organization Management*, *36*(2), 223-270.

Other sources: Full references to all sources used to create this case are not provided here. Instead, ***we encourage BUS 2880 students to conduct your own searches of relevant academic literature!***

Using Cases to Teach Evidence-based Management

Tatiana Andreeva

SUPPORTING THE EVIDENCE-BASED MANAGEMENT EDUCATORS

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Using Cases to Teach Evidence-based Management

Tatiana Andreeva

In this chapter, I will discuss how I use short cases (available for free) to teach evidence-based management (EBM). This approach enables students to apply the knowledge from the class immediately and develop their practical EBM skills. To contextualize my approach, I first explain why I started teaching EBM and specifics of my student cohort.

1. Why I Started Teaching EBM?

Six years ago I was assigned to teach "Actionable insights from research", a post-graduate (MSc) course aimed to introduce students to the basics of research methods. This course is a compulsory part of the MSc programme, as it also aimed to prepare students to work on their final MSc project, focused on solving some real-life problem for a client company. The student cohort for this course has been a mix of pre-experience MSc students – that is, students who started their MSc studies directly after their undergraduate degree, and of mature students who have work experience and are doing MSc either part-time alongside their work, or full-time being on a career break. The class size varies between 110 and 180 students, split into two sub-groups.

During my first year of teaching this course, I experienced some resistance from students to the course, or, rather, to the idea of research in general. Exploring their opinions, I found out that many of them – no matter their level of work experience – felt that research is something theoretical, very far from the daily business realities and hence not relevant for them. As most of my students did not aspire to pursue a research-related career, they often thought they did not need these skills in research.

Stimulated by this, I re-imagined the course. Having previous experience myself in business and in consulting, I did not agree with my students' perception that research skills are not needed in business. Indeed, decision-makers in business regularly find themselves in a situation when they need to analyze some evidence to make a decision. Sometimes, such evidence – and its' analysis – is provided to them by their subordinates. In other situations, it is not readily available, so a decision maker needs to identify needed evidence themselves or instruct their subordinates on doing so. While business decision-makers do not always perform data collection and analysis themselves, they need to be able to evaluate whether the evidence they have been provided is of a good quality and interpret it correctly; and to understand what additional evidence might be needed and feasible. All these are research skills. Similarly, a typical consulting assignment requires diagnosing a problem and potential solutions through identifying various types of evidence and critically analysing them. Furthermore, being a supervisor of the final MSc projects, I also saw how the lack of research skills impeded students in delivering a high-quality project. For example, some students struggled to identify what evidence was needed to understand client's problem better, whether the already available evidence was relevant and trustworthy and how to collect new evidence that would be trustworthy.

Therefore, I was looking for ways to demonstrate to my students the practical relevance of basic research skills and to win their motivation to acquire those skills. To do so, I drew on evidence-based management (EBM) which builds on the idea of helping managers to make better-informed decisions; it closely connects real-life business problems with the skills to collect and critically interpret evidence (that is, research skills broadly defined).

2. The Structure and the Contents of my EBM-based Course

The redesigned course was built around EBM as an overarching framework. In Appendix 1, I provide some extracts from my course handbook that outline the framing of the course, learning outcomes, key topics, and readings. First, I introduce the basic principles of EBM, discuss the need to diagnose the problem before jumping into solution, and go with the students through the steps for problem and solution diagnosis to identify gaps in evidence – across four types of evidence. To bring these to life, I do an in-class case analysis that I explain in more detail in the following sections of this chapter. The case discussion often surprises students, highlighting how decision-makers do not even realize they lack any evidence or misinterpret it dramatically. This helps to create an appetite among students to explore the evidence. For this section of the course, I mainly follow Chapters 1, 2 and parts of Chapter 4 (4.3 – 4.5) from Barends and Rousseau (2018).

In the next section of the course, I teach about finding and critically evaluating scientific evidence. Formerly, many of these aspects were covered in the course under "doing a literature review" topic, but I find that EBM guidelines help to enhance these materials by connecting

them to practical business problems and by pushing students to evaluate the scientific sources critically. In particular, I find the step-by-step instructions on how to perform a search in a database, as well as the checklists for evaluating scientific evidence from Chapter 7 (Barends & Rousseau, 2018) provide clear guidance to students. For this part, I follow Chapters 5, 6 and 7 from Barends and Rousseau (2018) and extend them with some extra materials. To demonstrate the practicality of these materials to my students and develop their skills, I invite them to apply what they have just learned to help the decision maker of the same fictional case we discussed in the first part of the course (again, more on this in the following section).

In the third section of the course, I discuss collecting evidence from stakeholders, practitioners, and the organisation, and introduce the basics of qualitative and quantitative research methods, such as interviews, observation, and surveys, as well as some basics of data analysis. In this section, I use Chapters 3, 4.1, 4.2, 4.6, 4.7, 8, 9, 10 and 11 from Barends and Rousseau (2018), and significantly extend them by going into more depth of practicalities of various methods of data collection and basics of data analysis, building on Saunders et al. (2015). To apply this learning to practice, I invite my students to design a new data collection plan that would help the decision maker of the same fictional case we discussed in the first part of the course to make better informed decision (see the following sections for further details).

In sum, I cover in my course chapters 1 to 11 from the EBM book (Barends and Rousseau, 2018). I skip the final chapters of the book (12-15) for two reasons. First, they cover the EBM steps that would be more challenging to simulate and practice with my students: they require working with already collected evidence, implementing a decision, and assessing its outcomes. Second, they go beyond the hours allocated to this course.

The students' response to the redesigned course was very positive. Student course evaluations improved dramatically. Here are some of the quotes from open-ended feedback questions:

- *"if I bring nothing else with me from my Masters, it's definitely your course notes".*
- *"I already see how this module will help me to make better decisions going forward, not only professionally, but personally too".*
- *"This book is with me for life".*

And here are the quotes from unsolicited student emails that I received, in some cases months after they completed the course:

- *"I just wanted to say thank you for that wonderful module. Hands down one of my favourite ones in the entire course… I believe if we put at least half of what you taught us in your module into practice, we would be much better decision makers."*

- *"This mail is just a gratitude note for teaching me the fundamentals of evidence-based study. ... Recently ... I joined a product management community to work on a project pitch. While I was thinking how to start the project, I decided to use my notes (from your class). I followed each and every step ...I am really happy that my learnings from (your class) are helping me to solve my project related queries".*

- *"I wanted to let you know that your great work in educating me in EBM is really paying off today. I was selected this morning for Jury Duty in the Criminal Court which will be ongoing for 6 days. I can tell you I am extremely glad to have done the (your) module. So much of the language is very familiar and so fresh in my mind. So thank you very much for all you have taught me".*

I have been teaching this course in this redesigned format for four years now, tweaking just small details. In the following section I will introduce my approach to teaching this course through an applied case study, that, I believe, was one of the factors that contributed to the success of the course, judging by the student feedback.

3. Using a Case Study to Teach EBM

My core idea in designing this course was to give students an opportunity to practice EBM skills, by applying them to a real-life situation. As the student population included students with no work experience, they could not bring real-life scenarios from their workplace. Moreover, given the class size, if students worked on their own – hence, different - cases, it would have been challenging for me to give them meaningful feedback and spot potential mistakes in their analysis. Hence, I opted for using a case study approach.

I use the case study approach to teach EBM in two ways. First, I use it during the course to demonstrate to students how the materials we learn in class can be applied to analyse the case, clarifying along the way potential questions and misunderstandings. For this purpose, I use the same case throughout the whole course, returning to it again and again, as we discuss new material, to let students apply the knowledge they just acquired. Second, I use a case study approach as a basis for a final assessment for the course: I ask students to analyse a different case, repeating the same steps as we did together during the course with the first case.

This approach allows me to guide students step-by-step in applying EBM principles to a business-life scenario and provide them with developmental feedback along the way before they do it on their own. As EBM calls for a significant shift in how students think and approach a problem, many students find it challenging first time. Therefore, I find that such repetitive approach helps to build both their skills and their confidence. Indeed, when I first run my EBM course, I used case analysis assignment mainly for summative assessment, and many students struggled to deliver submissions of good quality. The next time, I introduced the approach

I describe here – that is, used a case during the semester first and focused on developmental feedback. As a result, the quality of the final individual submissions increased dramatically.

Different ways of using a case study that I have tried over the years are summarized in Table 1. My current approach, that I find works best, is a combination of options 1 and 3. As I explained above, I would not recommend using option 1 alone.

Table 1. Various Options of Using a Case Study Approach for Teaching EBM

	OPTION	TYPE OF ASSESSMENT	COMMENTS
1	Final individual assignment	Summative, graded	Release assignment in full (three sections together)
2	Semester-long group project	Formative & summative (graded)	Release assignment section by section, after you've covered relevant material in class; provide feedback the next class
3	Semester-long in-class discussions	Formative (not graded)	Discuss the assignment section by section, after you've covered relevant material in class

Option 2 involved a semester-long student group project, where students were assigned to complete sections of the assignment outside class time in small groups after we had covered relevant material in class. They submitted their written reports before the next class, and then I provided developmental feedback to their reports in class. Those written reports had a low-stake grade attached to them, to motivate every group to engage with them.

I initially chose this approach, as EBM-focused analysis requires time, and I wanted my students to have enough time to focus on it. I also was hesitant to spend so much time in-class time on case discussions. However, this approach did not work well for me for several reasons. First, the nature of the task itself (see Appendix 2) may not be the best fit for the group collaboration. Students often divide sub-tasks within the group, but then individually each of them does not learn how to complete all steps of the analysis. Second, even though the grades assigned to the written reports were a small fraction of their final grade (10%) and I graded the reports leniently, many students were upset about their group grades – because there were many mistakes and misinterpretations of how to apply EBM. In the cases where group dynamics did not work too well, this reaction to the grades provoked further conflicts within the group.

Based on my experience, the first time students try to apply EBM principles, many of them make mistakes, even the best students – because EBM principles and logic are quite

different from what they have learned before. For example, many business students are used to analysing cases. However, a typical case analysis in a business school setting focuses on comparing or generating solutions, without questioning what the real problem is, or how serious and urgent it is. Hence, students naturally tend to jump the first two steps of the problem diagnosis according to EBM – that is, they skip the questions of "what is the problem to be solved?" and "What is the evidence for the problem?".

Based on these considerations, I stopped using the case assignment as a take-home group project and assigning formal grades to the students' first attempt at doing EBM analysis. Instead, I run it as an in-class group exercise (ungraded), to provide a safe space to make mistakes and learn from them. I had to revisit the materials I covered in class, to make time for in-case class discussions, but the resulting increase in students' understanding of EBM concepts and the quality of their individual final assignments was worth it. In Section 6 below I provide a step-by-step guide how I run this exercise in class.

4. Selecting a Case: Challenges and Tips

My initial considerations for selecting a case to use in my EBM class were the following: I wanted to use a relatively short case study, as from previous experience I knew that my students are less likely to engage with longer cases, and I did not have budget to acquire teaching cases that come with a fee. Hence, I opted to use a short case study published in Harvard Business Review magazine, as it is accessible for free for my students via the university library. I did not have to restrict myself to a particular problem domain, as any management-related problem could work for my purpose. At the same time, naturally, as an instructor, you may feel more confident to critically analyse and discuss with your students a case problem that is within your area of expertise.

Harvard Business Review (HBR) magazine typically publishes a short case study in each issue, so it looks as if I would have a wide variety of options to choose from. However, as I was reading these cases and trying to apply EBM steps of analysis to them, I realised most of them did not suit. The reason is that many of the HBR cases do not provide sufficient information about the evidence, in particular the evidence for the problem. Typically, they briefly introduce a problem, providing little to none evidence for it, and then pose a managerial dilemma as a choice between two (or more) solutions, offering some evidence for solutions (and sometimes this evidence is limited as well). This trend among HBR cases vividly illustrates a typical real-life problem, discussed in Barends and Rousseau (2018), – that decision-makers often do not spend enough time on diagnosing the problem, and jump into generating solutions. While being reflective of the reality of business decision-making, such cases would not be very useful for teaching EBM principles and steps, because they do not provide enough material to systematically explore all 4 steps of EBM diagnosis, in particular, to explore step 2 ("Ask: what is the evidence for the assumed problem?"). As a result, I had to filter quite a lot of HBR cases before I found some that would suit.

Below I list four cases that we (myself and my co-teachers Dr. Christian Martin, Dr. Umair ul Hassan and Dr. Steven McCarthy) have tried and tested, either for in-class discussions, or as a final assignment case. The marketing cases listed below are somewhat heavier on the solutions side in my perspective (but I am not an expert in Marketing), but they still provide some information about the evidence for the problem to enable discussion of this issue.

OB/HRM Cases:

- Bharadwaj, S. S. (2015). Can a Work-at-Home Policy Hurt Morale? *Harvard Business Review*, *93(*4), 105–109;
- Davidson, M., Reinemund, S., Borst, G., & Veihmeyer, J. (2012). How Hard Should You Push Diversity? *Harvard Business Review*, *90*(11), 139-143.

Marketing Cases:

- Bertini, M., & Tavassoli, N. (2017). When You Have to Choose Between Core and New Customers: An Extreme Sports Company Considers a VIP Tier. *Harvard Business Review*, *95*(5), 143–147;
- Beyersdorfer, D., & Dessain, V. (2011). Preserve The Luxury Or Extend The Brand? *Harvard Business Review*, *89*(1/2), 173–177.

Of these cases, my favourite is Bharadwaj (2015), and this is the one I prefer to use in class to demonstrate EBM. First, it provides quite rich information regarding potential problem(s), and some evidence for them. Second, and this is what I think makes this case particularly useful, is that it represents two different problems: one is the initial problem the business faced – and introduced a solution to; and second – a problem that was created by this solution, and now requires to be solved. I think this multi-layered structure of problems (and solutions) in this case represents well the reality of business decisions. This multi-layered structure of this case poses a challenge for students, because when they are asked to map evidence to a problem and solutions, they often get confused as to what evidence belongs to what element of the problem (or solution). However, I believe such challenge is very useful for students, as it helps to develop their critical thinking and analytical skills and nicely simulates real-life scenarios where practical problems (and solutions) are often ill-defined and/or represent an interconnected web of issues. That said, due to the complexity of this particular case, I would not recommend using it for assessment purposes (e.g., for a final assignment). Students may struggle with it without your support, and it may lead to their disappointment and disengagement.

If you would like to choose your own case, I suggest the following:

- Do the case analysis yourself, following the steps of the assignment (see Appendix 2). I find it useful to try completing checklists from Chapter 2 (pp. 20-23) of Barends and Rousseau (2018). Start with tables for Step 1 and Step 2. If you struggle to complete them, it means that the case does not provide enough material for illustrating EBM ideas. Hence, discard this case, and try another one.

- Do not rely on case discussions that are often offered in the HBR magazine – e.g., analysis of the case by some experts. Using EBM language, they typically offer either individual opinions (and hence need to be disregarded from an EBM perspective), or represent some evidence from practitioners – which is in most cases focused on solutions.

5. Design of the Case Assignment

The assignment includes three sections, following the three major sections of my course. Appendix 2 provides detailed description of the assignment with step-by-step instructions, as well as some notes on how you may want to amend it depending on the specifics of your course. Below I provide an overview of the assignment and explain how I use it.

Section 1 focuses on diagnosing the assumed problem and proposed solution, as they are described in the case study (steps 1-4 of EBM). As this section of analysis concludes with identifying missing evidence (if any), it paves the way for Sections 2 and 3 of the assignment, that correspond to second (Identifying and analysing the evidence from the scientific literature) and third (Identifying and analysing the evidence from the experts, the organisation or the stakeholders) sections of my course, respectively. As the end of Section 1, I ask students to identify at least two missing pieces of evidence that the decision makers in the case could gather to make a better decision: one piece of evidence from the scientific literature, and one piece of missing evidence from either organization, stakeholders or practitioners that requires collection of 'new' primary data.

These two missing pieces of evidence then guide the following sections of the assignment: Section 2 requires students to identify and critically evaluate some scientific evidence; and Section 3 requires students to propose a plan for collecting missing evidence from either organization, stakeholders or practitioners. Typically there are several pieces of evidence that are missing in the case (indeed, in my favourite cases most of evidence is missing). Identifying all the missing evidence would be a too big a task for students. Therefore, to keep the assignment focused, I ask students to pick only two missing pieces of evidence to focus on in their analysis. Therefore, even when analysing the same case, different students may choose to focus on different pieces of missing evidence, and hence go into different directions with their Sections 2 and 3. This makes the assignment very individualised, despite being built on

the same case study. When using Sections 2 and 3 as in-class exercises, such diversity may make class discussion and feedback too difficult to manage. Hence, I make a choice myself: I pick a specific missing piece of evidence and ask students in-class to focus on it.

This way, Section 1 of the assignment is directly based on the selected case. Sections 2 and 3 are connected to the case, because their initial starting point is missing evidence that was identified for the specific case, but the remainder of these parts does not require further work with the case study itself.

I use the same assignment structure (Appendix 2) for in-class work during the semester and the final assignment. The only difference that for the work during the semester, we complete the assignment section by section, in 3 steps, as we proceed through the course materials. For the final assignment, I ask the students to complete 3 steps together. If your course covers only some of various EBM steps, you can use some of the sections independently, for example, you may decide to do Section 1 only. If you decide to use Sections 2 or 3 independently, you may need to define for students a missing piece of evidence that you want them to focus on, as these form the starting points of these parts (see my notes in italics in Appendix 2).

For in-class discussion, we all focus on the same case, as it makes it easier to contrast different ideas and provide feedback. For the final assignment, I offer students two cases to choose from: on the one hand, it gives them some choice, on the other hand, it minimizes the variety of their solutions and hence makes grading easier. The more cases you offer them to choose, the more challenging your grading will be.

In Appendix 3, I provide grading rubric that I developed for this assignment. This grading rubric includes a list of evaluation criteria; description of the "ideal answer" and the list of typical mistakes students make on each aspect. I release this rubric to my students early in the semester to help them understand the expectations for this assignment.

6. Step-by-Step Guide on Using the Case Assignment for In-class Discussion

I assign students to read the case in advance of the class in which I plan to start discussing the case. The first moment to use the case is after you have covered the material from Chapters 1, 2, 4.3, 4.4 & 4.5 from Barends & Rousseau (2018). In practice, not every student reads the case in advance, but luckily Harvard Business Review magazine cases are short enough so a student could catch up in class.

In class, I assign students to small groups (4-5 students max.) and invite them to diagnose the problem and solutions, following EBM frameworks (Section 1 of the Assignment, Appendix 2 – that is, steps 1.1 – 1. 4). The overall discussion can take up to 120-150 minutes, depending on how large is your group, how talkative your students are, and whether you need to allocate extra time for students to read the case in class. Table 2 below provides a tentative time outline of the exercise. Minutes in brackets in column 1 indicate optional activities than can be skipped depending on the time you have available and your group size.

Table 2. Tentative Timeline of EBM Case Discussion: Section 1 of the Assignment

MINS	ACTIVITY
5	Intro to the exercises + assigning students into groups
(15)	Students read the case (optional, can be skipped if your students have read the case in advance)
20	Discussion in small groups of steps 1.1 and 1.2 (diagnosing a problem)
(10)	Students individually submit their answers online (optional)
40	Class discussion of steps 1.1. and 1.2
	A short break if needed
20	Discussion in small groups of steps 1.3 and 1.4 (diagnosing solutions)
(10)	Students individually submit their answers online (optional)
30	Class discussion of steps 1.3. and 1.4
(15)	Discussing the tips for individual assignment and typical mistakes (optional)

As students – similarly to managers, as discussed in Barends & Rousseau (2018) – tend to jump to solutions, I recommend splitting the overall discussion of Section 1 into two parts, first focusing on the problem, and only afterwords focusing on the solution. That's why, if your class time slots are too short to complete this exercise in one go, you can split it into 2 parts, focusing on steps 1.1 – 1.2 first, and doing steps 1.3-1.4 the next class.

To focus small group discussion of steps 1.1 and 1.2, I show the students the following a slide (Figure 1) and another one with the table on evidence (Table 3).

Figure 1. Introductory Slide for the Small Group Discussion, Steps 1.1-1.2

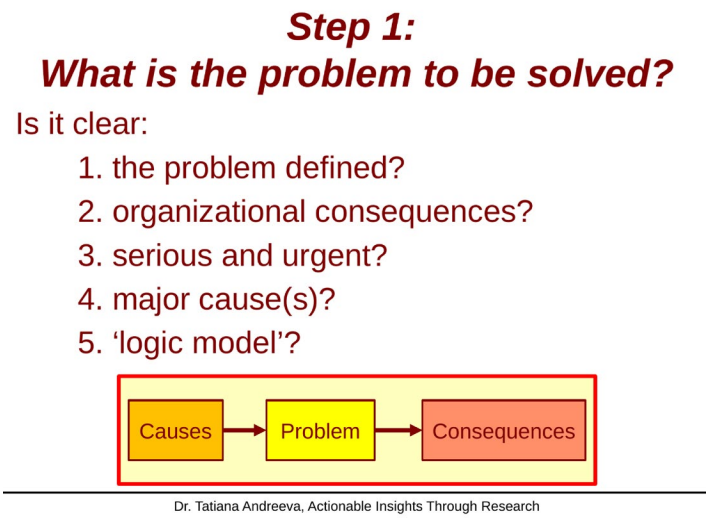


Table 3. Sample Table for Students to Complete at Steps 1.2 and 1.4 of the Analysis

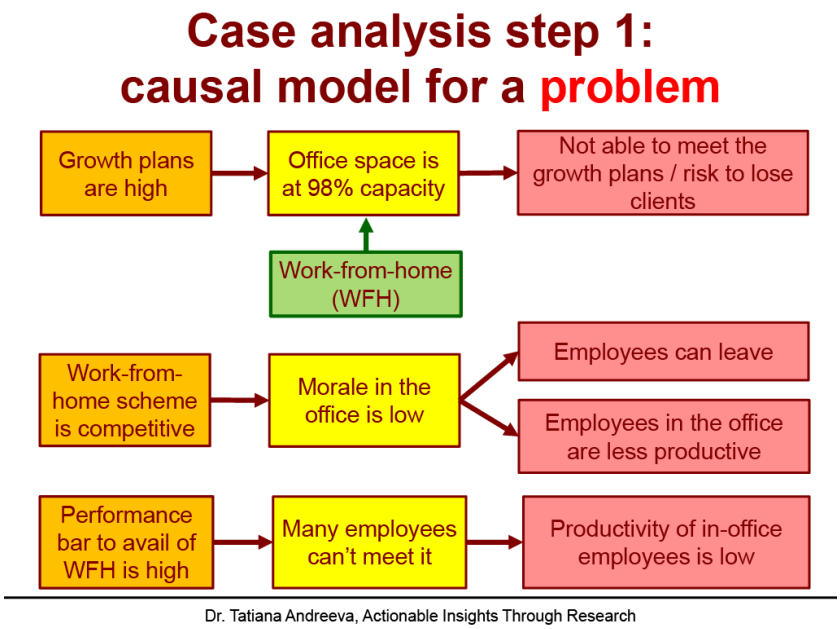
THE EVIDENCE FROM THE:	WAS IT USED?	IS IT RELEVANT?	IS IT TRUSTWORTHY?	DOES IT SUPPORT THE PROBLEM STATEMENT?
Scientific literature				
Practitioners /experts				
Most relevant stakeholders				
Organisation				

To encourage student engagement, especially in larger classes, and stimulate discussion, I allocate time for students, after they have completed their discussion in small groups, to submit their individual answers to a set of questions online. Appendix 4 provides a set of questions I use for this. After students have completed the quiz, I start in-class discussion, question by question. As we typically see a huge discrepancy in the answers, showing to the class the distribution of answers to the questions helps to start a discussion. If your student group is smaller and engaged, you can skip this step, and move directly into the overall debriefing.

To help students to focus on the causal logic, I encourage them to schematically draw models that link causes, problem, and consequences, as illustrated in the Figure 1. I find that such visualisation helps students to see the flaws in the logic of case characters (and in their own), as well as to see hidden assumptions in the logic models. Question 6 in the quiz (Appendix 4) is related to such models. As I see students' answers to the quiz, I draw a model or two on the class board and start debating with the students. A most typical mistake students do when they articulate logic models, is that they draw temporal sequences (what happened after what in the case), instead of models that reflect causality. When I see such a "temporal model", I ask students – does A really leads to B? (with A and B – being elements of the model they drew). Do you mean having more of A will create more of B? This question typically helps students to revisit their model to reflect causality.

Figure 2 below is an example of the causal models for the problems presented in the Bharadwaj (2015) case. This figure shows that there are at least three different problems in this case, and a solution discussed in the case (in green) addresses only one of them.

Figure 2. Examples of Causal Models for the Case Problems



Once we identify what are the problems and their logic models, I invite students to map the evidence cited in the case to those logic models (using Table 3 as a framework). One of the typical mistakes at this stage is that students confuse evidence for problem(s) with evidence for solution(s). Having visual representations of the problems as illustrated in Figure 2 helps to keep the relevant focus, as we try to map a specific piece of evidence to the model, it becomes easier to see if it does not belong there.

In the discussion, it transpires that not only some evidence available is irrelevant or untrustworthy, but also that different pieces of evidence belong to different logic models. At this stage, discussion gets heated, with many students being surprised, as they see how many questions we have about the proposed problems in the case, that render discussion of some of the solutions offered in this case study meaningless.

After we have completed diagnosing the problem, I invite students to the second stage of the exercise: doing a similar analysis for solutions (Figure 3 is the introductory slide, and I also show Table 3 and ask students to focus on evidence for the solution(s)). I follow similar steps as for the first part of the analysis: first students work in small groups, then I invite them to complete a short quiz to register their individual answers (Appendix 5 provides a set of questions for the quiz), and use their answers to start the discussion.

Figure 3. Introductory Slide for the Small Group Discussion, steps 1.3-1.4

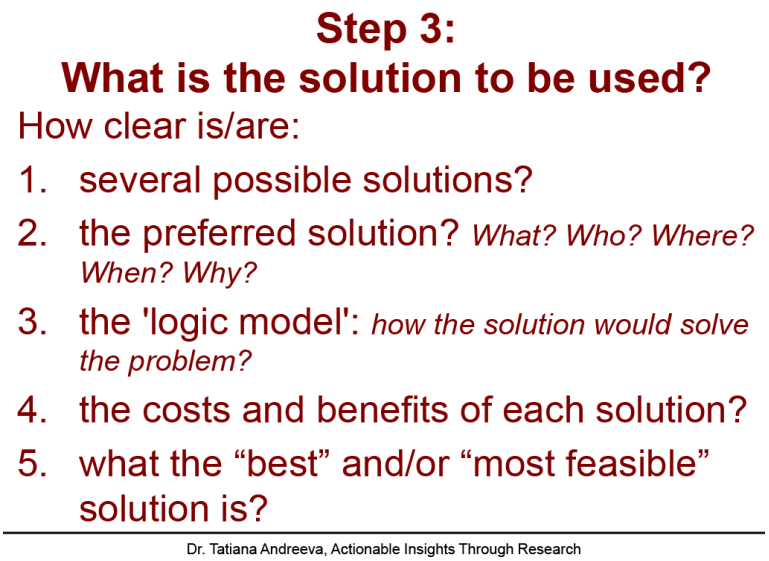


Figure 4 illustrates some logic models for the solutions in Bharadwaj (2015) case, while Figure 5 maps some of the solutions to the problems. I invite students to map four solutions debated in the case (four green boxes at the bottom of the Figure 5) to the problem. Once we have the logic models clearly articulated and visualized, it becomes evident to students that some of the proposed solutions cannot help with the problem.

Figure 4. Examples of Causal Models for the Case Solutions

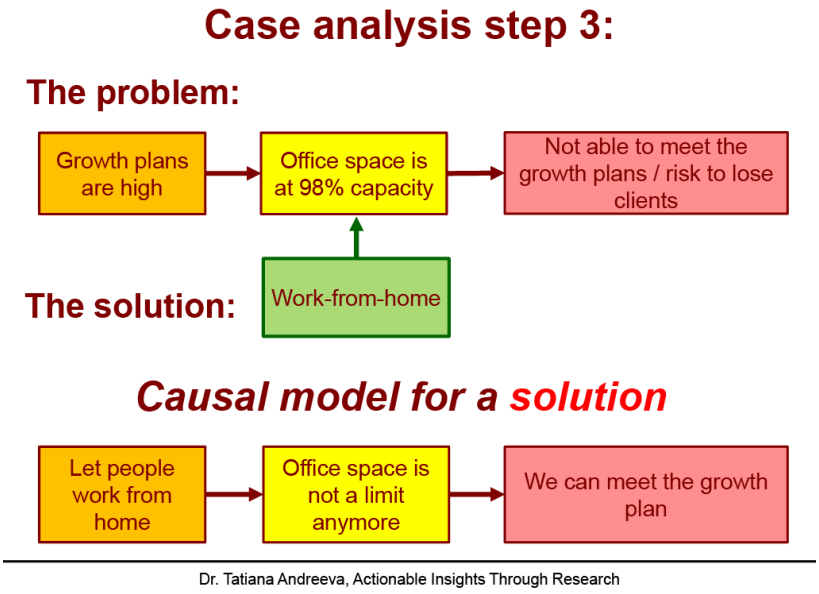
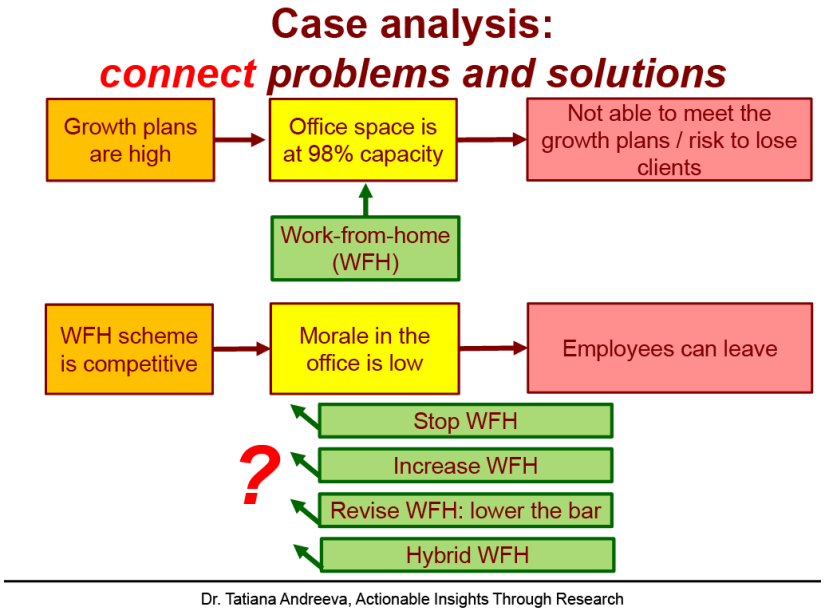


Figure 5. Mapping Solutions to the Problems in the Case



Once we finished with all steps of problem and solution diagnosis, I invite students to name a few missing pieces of evidence that might help the decision-maker in the case to make a better decision (step 1.5 of the Assignment, Appendix 2) – and based on this, formulate a relevant research question that can help to identify this missing evidence. At this stage of the discussion, as we have already identified many pieces of evidence as irrelevant and untrustworthy, it becomes easier for students to answer this question.

There are several typical mistakes that students do at this stage. First, they focus on evidence that is indeed missing, but not relevant (hence, not helpful) to solve a particular problem. To help students with this, I go back to the visualised logic models and ask them to map the evidence they are proposing to collect to a particular model. Second, some students are confused what types of evidence they should look for. For example, discussing Bharadwaj (2015) case, we identify that the case company characters think that company revenues could be affected by the work-from-home policy. While we agree during our joint analysis that this idea is not supported by evidence; what evidence could help to test this idea is not always clear to students. For example, some students suggest the following research question to explore:

- *How does case company's revenue compare to other companies in the same sector that operate a working from home scheme for employees?*

This question refers to organisational evidence, including evidence from competitors that might be difficult or even impossible to collect (unless all companies in the sector are public). But more importantly, this question also has a range of implicit assumptions that are

potentially problematic – for example, that the revenues of the companies in this sector are a result of "work from home" scheme, or that the companies that use this scheme, do it in the best possible way.

I suggest that another research question could help to test this idea, which refers to scientific evidence, for example:

- *What are the effects of the work from home scheme on organisational revenue?*

Finally, some students formulate questions that have too many interventions and outcomes in one question – making it very difficult for themselves to work with the next steps of EBM approach (searching for the evidence). For example, one of the students, discussing Bharadwaj (2015) case, suggested that the relevant question could be:

- *What are the effects of the work from home and competition between employees on job satisfaction, employee morale, turnover and firm performance?*

In this case, I encourage students to focus on one intervention and one outcome per question (and also invite them to map these to the logic models – do they really need all interventions or all outcomes?). For example, the question above could be reformulated as a series of questions:

- *What are the effects of the work from home on job satisfaction?*
- *What are the effects of the work from home on firm performance?*
- *What are the effects of the work from home on employee turnover? Etc.*

Once we have discussed all 5 steps of the Section 1 together, I explain to the students that their final individual assignment requires them to do the same analysis - including the very same steps – just for a different case. I also briefly discuss the typical mistakes I see in the Section 1 and provide tips on doing a better-quality assignment. A detailed list of items I discuss is presented in Appendix 6. At this point, I discuss only the tips for Section 1.

At a later point in the course, once I've covered further material (see section 5 above, and Table 1 in Appendix 2 below), I use the same approach to discuss Sections 2 and 3 of the assignment as in-class exercises. To focus the discussion, each time I chose for students a specific research question (missing piece of evidence from the case). Figure 6 provides an example of an exercise related to Section 2 of the assignment. For this exercise, I pre-select two academic papers on the topic, and invite students to critically evaluate this scientific evidence. Figures 7 and 8 provide examples of exercises related to Section 3. These exercises usually take less time than the discussion of Section 1, both because they can be split in smaller independent tasks, and because they usually do not generate so many disagreements and surprises, as the discussion of Section 1. Similarly as discussed for Section 1, after we have completed all in-class exercises relevant for Section 2, I explain that their individual assignment will follow the same steps, and discuss typical mistakes and tips for Section 2 (see Appendix 2). Later, I repeat the same for Section 3.

Figure 6. Sample Class Exercise Based on the Case: Critical Evaluation of Scientific Evidence

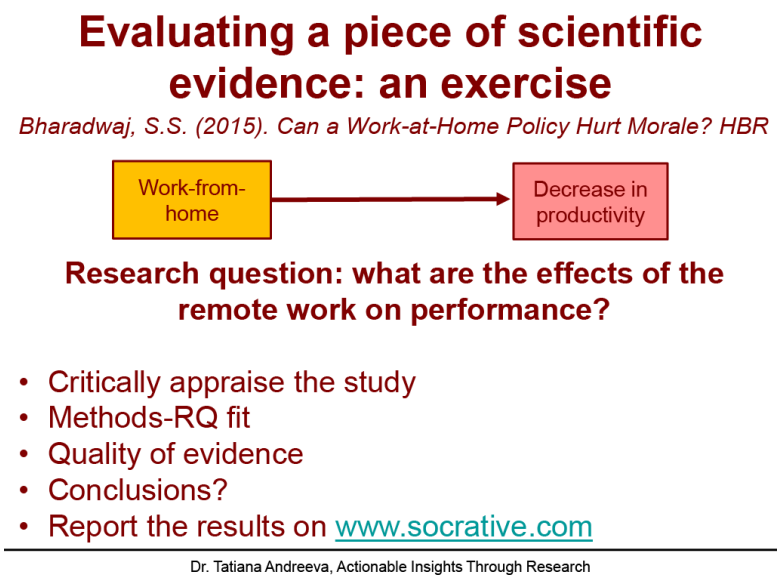


Figure 7. Sample Class Exercise Based on the Case: Collecting New Evidence 1

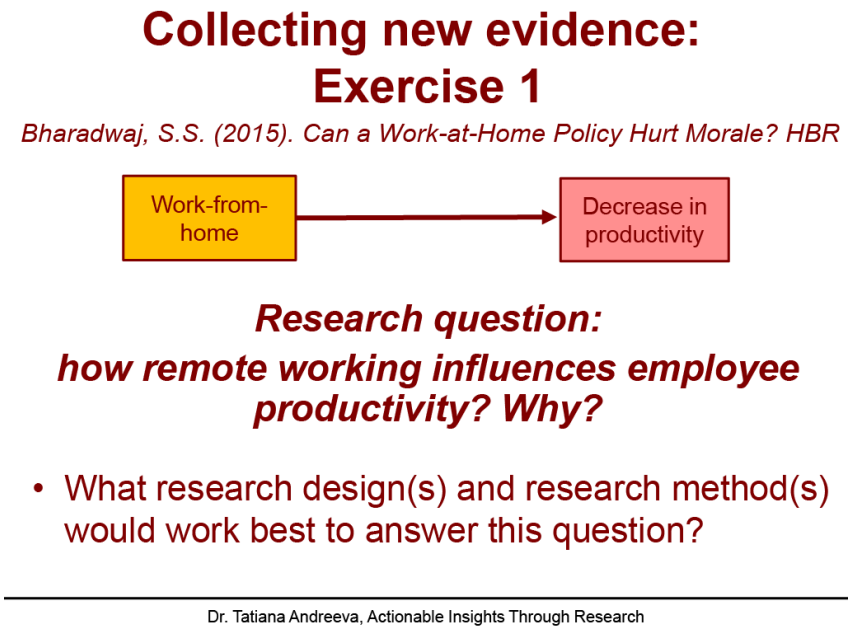
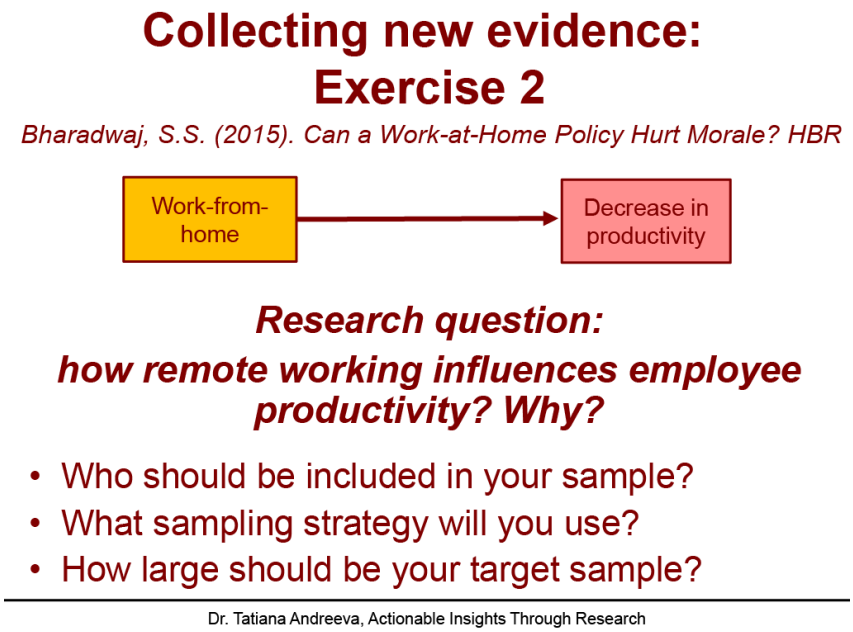


Figure 8. Sample Class Exercise Based on the Case Collecting New Evidence 2



References

Barends, E., Rousseau, D.M. (2018) *Evidence-Based Management: How to use evidence to make better organizational decisions*. Kogan Page.

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2015), *Research Methods for Business Students* (7th ed.), Pearson.

About the Author

Tatiana Andreeva is Associate Professor in Management and Organizational Behaviour at the School of Business, Maynooth University, Ireland. She has served as a Research Director in the School of Business for 2018-2023.

Her research addresses the challenges of managing knowledge in organisations. For example, Tatiana seeks to understand why people share or hide knowledge, and what (HR) managers can do to facilitate (or prevent) these behaviours. Her ongoing research projects examine the effects of the shift to hybrid work on knowledge sharing and collaboration in organisations – what challenges companies face and how to address them; and gender aspects of knowledge behaviours.

Tatiana's work has been published in the top-level international journals such as Human Resource Management Journal, Human Resource Management, Journal of Occupational and Organizational Psychology, Academy of Management Learning and Education, Journal of World Business and Journal of Management Inquiry, amongst others.

Tatiana teaches a range of organisational behaviour, knowledge management, evidence-based management and research methods topics. She has developed and delivered a range of classes in these areas across all levels – undergraduate, postgraduate, PhD and executive education - in Ireland, Belgium, Spain, Italy, Norway, Russia and Finland. In 2023, Tatiana received Maynooth University Teaching Award for her focus on student engagement, active learning, and use of experiential approaches.

Tatiana actively engages in translating her research into actionable insights accessible to broad audience, through business media interviews, articles, podcasts, and invited talks for practitioners.

Tatiana earned her PhD from St. Petersburg University Graduate School of Management (Russia), where she also obtained her MSc (International Business) and BSc (Management).

Before joining academia, Tatiana worked in management consulting and HR.

Appendix 1

Extracts from the Module Handbook "Actionable Insights through Research"

Why this module?

Decision makers in organisations often have a need for information that goes beyond their own and their teams' expertise and experience. This may be the case in novel situations or when complex phenomena occur. For example, what causes problem X and how can we address it effectively? In such decision situations, managers often rely on insights from business research to better comprehend phenomena or to test different ideas or suggestions. Using research to inform business decisions raises further questions: How to evaluate whether the available evidence is of a good quality and how to interpret it correctly? How to collect new evidence (that is, to carry out research) that will inform efficiently the business problem in question?

The purpose of this module is to foster an understanding of how research feeds into the decision-making process in organisations, to prepare you to locate and evaluate existing knowledge (i.e., be thoughtful consumers of research), and to carry out independent research to solve a business problem. The module will use Evidence-Based Management (EBM) framework to inform these learning aims.

Module Overview

In this module, we will discuss how to transform a decision problem into a question (or a set of questions) that can guide collection of evidence. Students will explore what types of evidence exist, where and how to locate them, and how to critically evaluate and analyze them. Students will learn how to identify or formulate causal models of how the world ought to work (i.e., what is the underlying causal logic behind the business problem) with the goal of informing our research. Furthermore, students will learn how to test these models against various types of empirical evidence. Throughout this module, students will begin developing relevant practical skills in identifying, evaluating, and interpreting evidence, such as undertaking a literature review, research design, data collection and analysis of data.

The practical relevance of business research to managers will be highlighted throughout the Actionable Insights Through Research module.

The module is experiential in design. Time in class will include some lectures and discussion, accompanied by exercises that lead to the development of essential research and decision-making skills.

Learning Outcomes

On successful completion of this module, learners will be able to:

- Explain how business research is linked to the needs of managerial decision makers;
- Transform a decision-making problem into a research question that can guide collection of evidence;
- Identify different types of evidence that are needed to inform a given decision-making problem and critically evaluate them;
- Extract evidence from a review of the academic literature;
- Assess the strengths and weaknesses of qualitative and quantitative research methods for gathering empirical evidence;
- Select the most suitable research method for gathering empirical data to inform a research question; and
- Carry out simple analyses of qualitative and quantitative data to inform a decision-making problem.

Teaching Arrangements and Methods

This is 5 ECTS credits module. It is structured into 4 full-day sessions. The module integrates various learning activities such as pre-class readings, lectures, in-class discussions, case analysis, group exercises, and individual assignments. Through these activities, we will cover the key steps of the evidence-based business decision-making, and business research process that can support such decision-making.

Core readings

The core set of readings is a combination of selected chapters from the core textbook:

- Barends, E., Rousseau, D.M. (2018) *Evidence-Based Management: How to use evidence to make better organizational decisions*. Kogan Page.

This core textbook is an essential reading, and it is available in Maynooth University Campus bookshop.

Students are expected to read materials in advance of lectures (as outlined in the table below). If you don't, you will be at a disadvantage in class discussions and will have more work to do when producing assignments.

Topic Outline with Assigned Readings

SESS. NO.	TOPICS	READINGS
1	Setting the stage: Why research for business? From business problem to causal model and research question. Types of evidence.	Barends & Rousseau (2018), Chapter 1, Chapter 2 & sections of Chapter 4: 4.3, 4.4, 4.5
2	Existing scientific evidence: how to find, interpret and critically evaluate	Barends & Rousseau (2018), Chapter 5, Chapter 6 & Chapter 7
3	Other types of evidence: how to critically evaluate existing evidence and to collect new evidence	Barends & Rousseau (2018), Chapter 3, Chapter 8 & Chapter 10
4	Analyzing quantitative and qualitative evidence	Barends & Rousseau (2018), Sections of Chapter 4: 4.1, 4.2, 4.6, 4.7, Chapter 9 & Chapter 11

Appendix 2

"Applying the Evidence-based Approach to the Analysis of a Case" Assignment

The assignment description below represents the final assignment for the course, used for assessment purposes. It can be also used as an interim assignment (or a series of) during the semester, as take-home tasks with follow-up in-class discussions, or as tasks for in-class discussions only. Table 1 below maps the sections of the assignment against EBM topics discussed in class. You can use sections 1, 2 and 3 of the assignment separately (amend intro as needed). The comments for educators are in italics (to be excluded from materials distributed to students).

Overview

This assignment is designed to help you to develop your research and decision-making skills by applying the principles of evidence-based management to the analysis of a case study. You can choose one of the following cases for your analysis: *(insert the cases here)*

You cannot switch between cases, however. Your assignment must be based on only one of the proposed cases.

The assignment consists of three sections that follow the learnings from sessions 1, 2, and 3 of the module respectively (see the Table 1 below). Below you will find information on each of the sections.

This assignment is worth 60% of your final grade.

Table 1. Mapping Class Topics and Sections of the Assignment

SESS. NO.	TOPICS DISCUSSED IN CLASS	RELEVANT SECTIONS OF THE ASSIGNMENT
1	Setting the stage: Why research for business? From business problem to causal model and research question. Types of evidence.	Section 1: Diagnosing the problem and the solution
2	Existing scientific evidence: how to find, interpret and critically evaluate	Section 2: Identifying and analysing the evidence from the scientific literature
3	Other types of evidence: how to critically evaluate existing evidence and to collect new evidence	Section 3: Develop a plan for gathering additional evidence from the experts, the organisation or the stakeholders

We recommend you work on this assignment in stages during the semester, rather than complete it in one go at the end. Start working on Section 1 of this assignment after Session 1 of the class. Similarly, after Session 2, you can work on Section 2, etc. This will help you to directly apply your learnings from relevant class sessions, and to spread the work on this assignment throughout the semester.

SECTION 1: DIAGNOSING THE PROBLEM AND THE SOLUTION

Diagnose the problem in the case and the solutions offered, using the frameworks and check lists discussed in class (Session 1). The checklists are available in Barends & Rousseau (2018), Section 2.9, pp. 43-48, PICOC is explained there on p.25. In your analysis, also consider the experts' comments that are offered by HBR after the text of the case. Consider these comments as evidence from practitioners. The following questions will guide you in your analysis.

Step 1.1: Clarity of the problem:

- What is the problem? What are its' causes and organisational consequences? What is the "logic" / causal model behind the problem? If some elements of the problem/ model are not clear, please indicate this and explain.
- What are the assumptions behind the problem statement? Note that these assumptions may differ between different characters in the case, as well as between different practitioners commenting on it. If that's the case, clarify this.
- What is the PICOC for the problem?

Step 1.2: Evidence for the problem

- What types of evidence were used by the characters in the case to diagnose a problem? What types of evidence were not used (i.e., not mentioned, if any)?
- Are these sources/types of evidence trustworthy and relevant? Justify your answer.
- Does this evidence support the problem statement/causal model presented in the case?

Step 1.3: Clarity of the solution

- What is the solution offered? What is the "logic" / causal model behind the solution? If some elements of the solution/model are not clear, please indicate this and explain.
- What are the costs and benefits of this solution (if we know them)?
- Were multiple options for a solution considered in the case?

Step 1.4: Evidence for the solution

- What types of evidence were used by the characters in the case or by commenting experts to support the solution? What types of evidence were not used/not mentioned?
- Are these sources/types of evidence trustworthy and relevant? Justify your answer.
- Does this evidence support the solution presented in the case?

Step 1.5: Needs for additional evidence

- Based on the analysis above, identify two key pieces of evidence (i.e., related to the logic model underlying the problem or the solution) that are still missing and that the decision makers could gather to make a better decision. Formulate research questions that will guide searching for this evidence.
    a. One piece of evidence needs to come from existing empirical evidence from the scientific literature. For example, if the missing evidence you identified concerns the performance effects of remote working, the research question could be: How does remote working effects individual work performance?
    b. The other piece of evidence needs to be missing empirical evidence from the organization, stakeholders or practitioners that requires collection of 'new' primary data (i.e., not secondary data). For example, if the missing evidence you identified concerns the job satisfaction differences (if any) between work-from-office and work-from-home employees in your organisation, the research question could be: What are the differences in job satisfaction between employees that work from home and that work from office?

You will work on identifying these two missing pieces of evidence – and answering respective research questions - in the Sections 2 and 3 of this assignment respectively. These two pieces of evidence may be closely related (e.g. evidence on what motivates workers as suggested by the scientific evidence; and on what motivates employees in a particular case organisation); or may be less so. It is your choice to decide what are the key needs for evidence in the case that you analyse.

SECTION 2: IDENTIFYING AND ANALYSING THE EVIDENCE FROM THE SCIENTIFIC LITERATURE

As you completed Section 1 of this assignment, at the step 1.5a you identified one piece of evidence from the scientific literature that is still missing and that could help decision makers in this case study to make a better decision to solve their problem – that is, a question that needs to be answered.

Identify existing empirical evidence in the scientific literature that answers this question and critically evaluate it. Follow the steps that were discussed in class during Session 2, as

well as relevant checklists in Barends & Rousseau (2018). The following questions will guide you in your analysis.

If you would like to use this section of the assignment separately from Section 1, or to limit the variety of topics that students explore in their search for scientific evidence, you can suggest yourself a research question for all students in the class to focus, instead of allowing them to choose based on their conclusions from the Section 1. This makes it easier for you to lead in-class discussion of this section of the assignment.

Step 2.0: A Research Question

- Clearly articulate the research question you plan to address in this Section of the assignment (that is, what missing evidence you will be looking for). After class discussion of Section 1, if you wish, you can modify or change the research question you initially suggested at the Step 1.5a of the Section 1 of the assignment.

If you ask your students to submit Section 2 of this assignment at the same time as Section 1 (e.g., if you use all three sections together as a final course assignment), skip this step: Students will formulate this research question at step 1.5a above. However, if you split the assignment in parts, and discuss Section 1 in class and/or provide students with some feedback on it, I recommend you include this step. In my experience, many students want to revisit their initial research question after discussion or feedback.

Step 2.1: Literature Search Strategy

- Develop the search strategy that will enable you to identify empirical evidence from the scientific literature for the research question defined in Step 1.5a. In particular, decide on:
  - > Search strings to use;
  - > Sources to search in;
  - > Inclusion/exclusion criteria
- In your report, explain this search strategy, and report your interim steps and search results (e.g., what search strings you tried, how you modified your search strings based on your findings, how many papers you found using particular combinations of the search strings, what inclusion/exclusion criteria you used, etc.). This can be done well in a table.

Step 2.2: Select the Evidence

- Among the scientific evidence that you found select two papers. Focus on empirical work; and – where possible - include systematic reviews and/or meta-analysis. Explain your choice. That is, how are the selected papers relevant to the problem or potential solution(s) in the case study?
- Cite the selected papers in your bibliography section using Harvard style (see below for details).

Step 2.3: Critically Evaluate the Evidence

- Analyse the evidence (i.e., the papers that you have selected in step 2.2). Use the checklists from the textbook (Chapter 7) that are appropriate to the research design of the selected piece of evidence. In particular,
  - > evaluate the fit of the research design used for the research question that a given article seeks to answer;
  - > identify methodological weaknesses, if any;
  - > evaluate the trustworthiness of the findings and conclusions based on the considerations above;
  - > briefly summarize (i.e., 1 – 3 sentences) the main conclusion of this piece of evidence.

Step 2.4: Identify the Conclusions

Integrate and briefly (i.e., a few sentences) summarize your findings from Step 2.3: what does the evidence from scientific literature say about your research question?

SECTION 3: DEVELOP A PLAN FOR GATHERING ADDITIONAL EVIDENCE FROM THE EXPERTS, THE ORGANISATION OR THE STAKEHOLDERS

As you completed Section 1 of this assignment, at the step 1.5b you identified one piece of evidence from the organisation, stakeholders or experts that is still missing and that could help decision makers in this case study to make a better decision to solve their problem – that is, a question that needs to be answered.

In this section, explain how you would gather this missing piece of empirical evidence. Apply the considerations that were discussed in class during Session 3. The following questions will guide you in your thinking.

If you would like to use this section of the assignment separately from Section 1, or to limit the variety of topics that students explore in this section of the assignment, you can suggest yourself a research question for all students in the class to focus, instead of allowing them to choose based on their conclusions from the Section 1. This makes it easier for you to lead in-class discussion of this section of the assignment.

Step 3.0: A Research Question

- Clearly articulate the research question you plan to address in this Section of the assignment (that is, what missing evidence you will be looking for). After class discussion of Section 1, if you wish, you can modify or change the research question you initially suggested at the Step 1.5b of the Section 1 of the assignment.

If you ask your students to submit Section 3 of this assignment at the same time as Section 1 (e.g., if you use all three sections together as a final course assignment), skip this step: Students will formulate this research question at step 1.5b above. However, if you split the assignment in parts, and discuss Section 1 in class and/or provide students with some feedback on it, I recommend you include this step. In my experience, many students want to revisit their initial research question after discussion or feedback.

Step 3.1: Define the Data Collection Strategy

- What source of evidence will you tap into (i.e., organizational or stakeholders)?
- Which research design (i.e., qualitative or quantitative) and which specific method (e.g., cross-sectional survey or qualitative interviews) will you use and why?
- Who will you collect the data from? Please define precisely who your potential participants (i.e., population of interest) will be and provide an explanation for why you think that this population is suitable.
- Often it is neither feasible nor necessary to ask all potential participants. Rather, you will collect data from a sub-sample of the population you are interested in. How will you select individuals for your study (i.e., what sampling strategy will you use) and why?
- What sample size will you go for (roughly) and why? To support your reasoning, please make a rough estimate of the overall size of the population of interest.
- When and where will you collect data from them and why?

Step 3.2: Questions to be Asked

- Please briefly discuss what topics you will cover in this data collection.
- Develop 3 – 5 example questions that could be used in this data collection. These should be related to the topics of interest (i.e., age, gender, etc. do not count here). Often, it is desirable to use pre-existing measures/questions from extant scientific literature. You do not necessarily have to do this, but it is absolutely OK to suggest pre-existing measures here instead of developing your own questions.
- For questions you developed yourself: Please explain your thought process when you developed these questions (e.g., their content and wording).
- For questions/measures from the scientific literature: Please provide references to the scientific papers that developed the measures/questions you are suggesting, discuss why they are suitable for your data collection, and evaluate the measures/questions using the criteria discussed in class.

Step 3.3: Evaluation of Your Data Collection Design

- Discuss how this data collection will be helpful in dealing with the situation in the case. That is how will the evidence collected help in understanding the problem or its solution(s) better?
- Please briefly reflect on potential strengths and weaknesses of your proposed data collection design (e.g., general strengths or weaknesses of the method, the sampling procedure, etc. in answering your specific research question, as discussed in class).

THE REPORT

Summarize all steps above in a written report. Please follow the steps/questions listed above to structure your report. The report should be between 2,500 – 3,600 words long (approx.). Information listed on the cover page, the statement of originality, the bibliography, and the search strings (part of Step 2.1) do not contribute to the word count. If you are using tables to illustrate or summarize your arguments, please insert them as text tables, not as figures. The words in the tables contribute to the wordcount. When the table is needed to support or clarify your argument or conclusion, insert it in the main body of your assignment (not in Appendix).

GRADING CRITERIA

Your report will be evaluated based on the following criteria:

- **Application of module material/frameworks:** Models and frameworks covered in the module (both during lectures and in readings) need to be applied and used in the analysis of the case. Two issues are important here – (a) correct interpretation of the material; (b) relevant usage of the material.
- **Rationale of the arguments:** Your arguments need to be clearly reasoned and explained.
- **Structure of the report:** A flow of thoughts with no structure will be evaluated lower than a structured answer with a clear logic.
- **Critical thinking:**
  - > Capability to see assumptions behind the problem and solutions statements; to evaluate trustworthiness and relevance of the evidence that support problem and solutions statements.
  - > Capability to evaluate trustworthiness and relevance of the scientific evidence.
  - > Capability to design a research project that will allow the decision makers to gather important evidence with the goal of understanding the problem or the solution(s) better.

Appendix 3

Sample Grading Rubric for the Assignment "AITR 6273 Overall Grading Rubric"

Excellent	70-100	The answer addresses all mentioned points in a relevant and clearly explained way, demonstrating excellent understanding and relevant usage of the module materials. ***Demonstrates strong critical thinking***
Very good	60-69	The answer addresses most mentioned points. Most of the answers are relevant and clearly explained way. It may contain some minor mistakes/omissions/ unclear aspects. Overall it demonstrates very good understanding and relevant usage of the module materials. ***Demonstrates good critical thinking***
Good	50-59	The answer addresses many mentioned points. Some answers are not clearly explained or not relevant. It contains some major mistakes or a range of unclear arguments. It demonstrates decent understanding of some of the module materials. The module materials are used but in a limited way or misinterpreted or applied correctly in some parts. ***Demonstrates attempts to or some elements of critical thinking***
Satisfactory	40-49	The answer addresses only few of the mentioned points. Many answers are not clearly explained or not fully relevant. It contain many major mistakes/omissions. It demonstrates only limited understanding of the module materials. The module materials are used in a very limited way or misinterpreted or wrongly applied in many parts. ***Demonstrates no or very limited critical thinking***
Not Satisfactory	0-40	The answer is lacking or/and irrelevant and/or contains major mistakes that demonstrate full lack of understanding of the question posed. No usage of module materials or full misinterpretation of them. ***Demonstrates lack of critical thinking***

Grading Rubic Part 1, Part 2, Part 3 follows.

Appendix 4

A Quiz for Collecting Individual Students' Answers to the Analysis of the Case (Section 1, steps 1.1. – 1.2)

All the questions below relate to the case study "Can a Work-at-Home Policy Hurt Morale? Harvard Business Review, 93(4): 105-109.

1. In your understanding, what is the main problem in the case? Please be brief, focus on one key issue. If you think it's unclear, please state so.
2. Is it clear what the organizational consequences of the problem are?
   a. Very clear
   b. Fairly clear
   c. Somewhat unclear
   d. Very unclear
3. Is this problem serious?
   a. Yes
   b. No
   c. It is not clear from the case
4. Is this problem urgent to solve?
   a. Yes
   b. No
   c. It is not clear from the case
5. Is it clear what the 'logic model' is?
   a. Very clear
   b. Fairly clear
   c. Somewhat unclear
   d. Very unclear
6. If you think the "Logic model" is clear or somewhat clear, please write it down below (e.g., salary is low → people are not motivated → performance is low)
7. What are the (hidden) assumptions behind this logic model (if any)? Please write down one or two; if you think there are no hidden assumptions, please write "none"

8. Does the evidence from the **organisation** support the assumed problem?
    a. Yes
    b. No, because this type of evidence was not used
    c. No, because the evidence used is not relevant to the assumed problem
    d. No, because the evidence used is not (fully) trustworthy
    e. No - the evidence is relevant and trustworthy but it does not support the assumed problem
9. Does the evidence from **practitioners** support the assumed problem?
    a. Yes
    b. No, because this type of evidence was not used
    c. No, because the evidence used is not relevant to the assumed problem
    d. No, because the evidence used is not (fully) trustworthy
    e. No - the evidence is relevant and trustworthy but it does not support the assumed problem
10. Does the evidence from **relevant stakeholders** support the assumed problem?
    a. Yes
    b. No, because this type of evidence was not used
    c. No, because the evidence used is not relevant to the assumed problem
    d. No, because the evidence used is not (fully) trustworthy
    e. No - the evidence is relevant and trustworthy but it does not support the assumed problem
11. Does the evidence from the **scientific literature** support the assumed problem?
    a. Yes
    b. No, because this type of evidence was not used
    c. No, because the evidence used is not relevant to the assumed problem
    d. No, because the evidence used is not (fully) trustworthy
    e. No - the evidence is relevant and trustworthy but it does not support the assumed problem

AITR 6273 - detailed criteria and typical mistakes for the individul assignment

Criteria	The excellent answer includes the following:	Typical mistakes
Part 1: Problem diagnosis		
Step 1.1: Clarity of the problem		
Problem is clearly defined? What are the cause and consequences?	Problem, it's causes & consequences are clearly identified and well explained. If there are several problems - they are isolated clearly.	Problem is not clear. Several problems are all mixed together. Causes and consequences are not clear
Causal model is identified / correct / logical?	Causal model is correct and clear	no causal model or it's not clear.
Assumptions identified correctly?	Identified one or several assumptions correctly	No assumptions mentioned. Or - assumptions are misinterpreted /incorrect (what is offered as assumptions is not assumptions).
PICOC correct?	PICOC is provided and all elements are correct	PICOC is omitted, or some elements of the PICOC are incorrect/irrelevant
Step 1.2: Evidence for the problem		
All relevant types of evidence identified? (used & not used)	All types of evidence are correctly identified as per EBM classification. Not used evidence is identified too (e.g., the paper points that scientific or stakeholder evidence has not been consulted). If on the step 1 several problems are identified - evidence is clearly and correctly attributed to different problems.	No use of EBM language in identifying types of evidence. Not used evidence is not identified. Types of evidence from EBM used but incorrectly. Confusion between evidence for problem and evidence for solution; or confusion between evidence for different problem statements
Relevance & trustworthiness evaluated?	Each piece of evidence is critically evaluated for its relevance and trustworthiness. Demonstrates critical thinking	No evaluation of evidence. Or very naïve evaluation - that all is good.
Conclusion re supporting the problem is made?	Clear overall conclusion on whether the evidence in its' totality supports the problem statement or not	No clear conclusion
Step 1.3: Clarity of the solution		
Solution is clearly defined?	Solution(s) are clearly identified and explained. If there are several solutions - they are isolated clearly.	Solution is not clear. Several solutions are all mixed together. Causes and consequences are not clear. Students jump into proposing their own solutions
Causal model is identified / correct / logical?	Causal model is done clearly and correctly for at least one core solution	no causal model or it's not clear.
costs&benefits considered?	costs and benefits are clearly explained for one solution - if it's only one identified. If two or more solutions are identified - costs & benefits are done for at least 2, so that it's possible to compare the alternatives	No cost/benefit analysis, or it's unclear
multiple solutions addressed?	clear conclusion regarding whether alternative solutions were considered by the case characters	this question is not addressed
Step 1.4: Evidence for the solution		
All relevant types of evidence identified? (used & not used)	All types of evidence are correctly identified as per EBM classification. Not used evidence is identified too (e.g., the paper points that scientific or stakeholder evidence has not been consulted). If on the step 3 several solutions are identified - evidence is clearly and correctly attributed to different solutions	No use of EBM language in identifying types of evidence. Not used evidence is not identified. Types of evidence from EBM used but incorrectly. Confusion between evidence for problem and evidence for solution; or confusion between evidence for different solution statements
Relevance & trustworthiness evaluated?	Each piece of evidence is critically evaluated for its relevance and trustworthiness. Demonstrates critical thinking	No evaluation of evidence. Or very naïve evaluation - that all is good.
Conclusion re supporting the solution is made?	Clear overall conclusion on whether the evidence in its' totality supports the solution statement or not	No clear conclusion. Jump into offering student's own solution
Step 1.5: Needs for additional evidence		
Missing evidence/RQ is idenfied and explained?	Missing piece of evidence and related RQs for both new empirical evidence (=organizational, stakeholder or practitioner) and existing empirical evidence (scientific evidence) are clearly formulated and well explained. Each of the two questions is suitable for collecting the relevant type of evidence and correctly formulated.	RQs are formulated as generic decision-making dilemma and not suitable for collecting missing evidence. RQ are too overloaded, with too many interventions and outcomes in one question. Yes/no type of questions. The RQs are not linked to the analysis of steps 1.2 and 1.4. of part 1 - therefore, it's not clear how these questions will help to solve the decision-making dilemma in the case

AITR 6273 - detailed criteria and typical mistakes for the individul assignment

Criteria	The excellent answer includes the following:	Typical mistakes
Part 2: Search and evaluation of sc	**The excellent answer includes the following:**	**Typical mistakes**
Step 2.1: Literature search strategy		
Search string. Use of PICOC.	Clear search strings are reported, they are clearly linked/based on the RQ identified at the step 1.5 above. Correctly applies PICOC for this RQ to identify relevant search strings. Search strings are designed correctly	Search strings are only loosely related, or not related at all to the chosen RQ. Search strings seem to be "randomly" chosen. Search strings are incorrect or not explained well
Have students identified potential synonyms?	Identifies relevant synonyms for the core search keywords	Does not talk about synonyms at all, or introduces "synonyms" that are not actually synonyms but rather "some other words"
Usage of Boolean operators	Correcly uses boolean operators (AND, OR, etc) to create relevant search strings	Use OR between intrvention and an outcome; or use AND between synonyms
Sources to search in. One or more databases.	Uses relevant academic databases for the search	Use only google scholar as a database
Inclusion/exclusion criteria.	Chooses exclusion and inclusion criteria that relevant to the RQ and problem posed and clearly explains them.	No mention of excl/incl criteria. Or: excl/incl criteria are not explained and not really relevant - e.g., looking only at the literature for the last 5 years, when phenonemon is not necessarily so new
Systematic reviews/meta-analysis	Searched for systematic reviews/meta-analysis, correcly using EBM search string	Omits systematic reviews/meta-analysis
Search resutls and explaination	Excellent work will report how many hits different search strings yielded. If some amendments were made in the search strings and these are clearly explained, it's good.	Not clear, how many search hits were received. Or says that too many hits were received, and then changes totally the search keywords, while it's possible that just incl/excl criteria or Boolean operators were not set correctly
Step 2.2: Select the evidence		
Justification of selection	Provides clear and relevant explanation of how the papers for analysis were selected from the hits received at the previous step. The rerepot uses scanning titles and abstracts of the papers to identify their relevance to the RQ posed. Among those deemed relevant, prioritises first systematic reviews or meta - analysis (if there are any), and then empirical papers. Uses ABS journal ranking to inform selection among relevant papers. Provides full references of the selected papers	Papers selected are not RELEVANT to the RQ posed - either by their topic, or because they are conceptual paper. The choice of the papers is not explained. No ABS ranking is used. ABS ranking is claimed but incorrectly
Step 2.3: Critically evaluate the evidence		
Evaluation of research design and question fit	Correcly identifies the RQ and the research method of the paper. Correctly applies EBM materials to identify the fit between RQ of the selected paper with the research design/method it uses	No EBM materials are used. Re-tells the paper. Research design is not correctly identified (e.g., a qualitative paper is called meta-analysis)
methodological weaknesses	Correctly applies relevant EBM checklists to identify methodological weaknesses	No EBM materials are used. Weaknesses are directly borrowed from the limitations section of the selected paper. Uses wrong checklists (e.g., meta-analysis checklist for the cross-sectional study). No critical thinking demonstrated.
trustworthiness of the findings and conclusions	Correctly applies relevant EBM checklists to evaluate overall trustworthiness of the findings. Clearly concludes whether this evidence can be trusted or not	
brief summary (i.e., 1 – 3 sentences) of the main conclusion	Clearly identifies what is the answer from the specific paper to student's RQ set at step 1.5.	Retells the paper.
Step 2.4: Identify the conclusions		
Integrate and briefly summarize your findings	Clearly links collected evidence to the posed RQ and identifies what the two selected papers selected tell about this RQ	retells again the papers

AITR 6273 - detailed criteria and typical mistakes for the individul assignment

Criteria	The excellent answer includes the following:	Typical mistakes
Part 3: Collecting new evidence		
Step 3.1: Data collection strategy		
Type of evidence to be collected is clearly mapped	Clearly explains what type of evidence is needed to answer the primary data collection question set at step 1.5. Clearly uses EBM language: to what group the evidence to be collected belongs: practitioner, stakeholder, organisational evidence? If it could belong to several categories (as they may overlap), the answer includes reflection on this	No use of EBM categories
Are research design & research method clearly explained? Are they suitable for the chosen RQ? Does the research method fit with the research design?	explains WHY this research design & research method would work best for this RQ. Chosen design & method fit with RQ and with each other	Provides generic information about advantages and disadvantages of some research design or method (e.g., explains generic differences btw quant and qual studies), that is not applied to the specific RQ of interest. Research design or method don't fit with each other or the RQ. Uses marginally relevant or low quality sources to support the claims about advantages/disadvantages of some methods (e.g., blog posts or methodological literature not from management/business field).
Who the data will be collected from?	clearly explains who potential participants (population of interest) are and explains why this population is suitable to answer the RQ	it's not clear who exactly will be potential participants of the survey
What sample size and why?	clearly estimates appropriate sample size and explains the logic of the choice. Refers to the module materials in this explanation.	sample size is not mentioned at all; or not explained; or sampling approach does not match the chosen research method
Is sampling strategy specified and clearly explained?	clearly explains sampling strategy, that is how participants for the study will be selected and why. Refers to module materials, e.g. to some types of sampling strategies discussed in class	no sampling strategy is discussed; or sampling strategy looks random, or not justified
When and where the data will be collected?	clearly explains the procedure of data collection	no information on how the data will be collected
Step 3.2: Questions to be asked?		
What topics will be covered in data collection?	clearly explains the topics to be covered in data collection. These topics are relevant for the RQ chosen	Topics include wide range of issues, that go beyond or very far from the chosen RQ
Are sample questions suitable for the chosen method?	proposed questions suit the method chosen on step 3.1	The questions proposed do not fit the research method chosen at the step 3.1 above
Are sample questions correctly formulated?	proposed questions are worded following various guidelines in the module, either for survey or for interview questions (e.g., not double-barelled; not leading questions, etc)	questions proposed are double-barelled, that is "overloaded" (too many things in one question, so it would be difficult to understand what respondent replied to). Questions formulated as "effect questions" (e.g., in the survey - "the effect of work from home on my well-being is negative", so the question assumes the effect)
Is relevant scientific literature used?	proposed questions, where applicable and relevant, are based on the previously validated questions from the scientific literature. It does not ALWAYS have to be based on the literature, as not for every question there would be relevant literature. But especially for latent constructs (like customer satisfaction, employee motivation, etc), it would be beneficial. If the answer for step 3.2 is excellent for all other aspects, but is not based on the scientific literature - it does not have to be downgraded.	
Step 3.3: Critical evaluation of the proposed design		
how will the evidence collected help in understanding the problem or its solution(s) better?	Clearly links back to the chosen RQ and to the overall problem or solution discussed in the Part 1 of the assignment, and explains how the evidence collected will help to solve it	no clear answer to this question.
What are potential strengths and weaknesses of the proposed data collection design?	Critically reflects on the strengths and weaknesses SPECIFIC to the data collection proposed above, demonstrates understanding of the limitations of the proposed approach.	Provides generic information about advantages and disadvantages of some research design or method (e.g., explains generic differences btw quant and qual studies), that is not applied to the specific data collection strategy proposed above. Uses marginally relevant or low quality sources to support the claims about advantages / disadvantages of some methods (e.g., blog posts or methodological literature not from management/business field). No critical thinking demonstrated

Appendix 5

A Quiz for Collecting Individual Students' Answers to the Analysis of the Case (Section 1, steps 1.3. – 1.4)

1. Please specify which **assumed problem** you have focused on in your analysis of the solutions (be brief, 3-5 words are ok).
2. In your understanding, what is the main solution that is offered in the case to solve this problem? Please be brief, focus on one solution. If you think the solution is unclear, please state so.
3. Is it clear what the 'logic model' is: how the solution would solve the problem?
   a. Very clear
   b. Fairly clear
   c. Somewhat unclear
   d. Very unclear
4. If you think the "Logic model" is for this solution is clear or somewhat clear, please write it down below (e.g., increase salary → people will be more motivated → performance will increase).
5. Is it clear what the solution's costs are?
   a. Very clear
   b. Fairly clear
   c. Somewhat unclear
   d. Very unclear
6. Were multiple options for solutions considered?
   a. Yes
   b. No
7. Does the evidence from the **organisation** support the proposed solution?
   a. Yes
   b. No, because this type of evidence was not used
   c. No, because the evidence used is not relevant to the proposed solution
   d. No, because the evidence used is not (fully) trustworthy
   e. No - the evidence is relevant and trustworthy but it does not support the proposed solution

8. Does the evidence from **practitioners** support the proposed solution?
    a. Yes
    b. No, because this type of evidence was not used
    c. No, because the evidence used is not relevant to the proposed solution
    d. No, because the evidence used is not (fully) trustworthy
    e. No - the evidence is relevant and trustworthy but it does not support the proposed solution
9. Does the evidence from **relevant stakeholders** support the proposed solution?
    a. Yes
    b. No, because this type of evidence was not used
    c. No, because the evidence used is not relevant to the proposed solution
    d. No, because the evidence used is not (fully) trustworthy
    e. No - the evidence is relevant and trustworthy but it does not support the proposed solution
10. Does the evidence from the **scientific literature** support the proposed solution?
    a. Yes
    b. No, because this type of evidence was not used
    c. No, because the evidence used is not relevant to the proposed solution
    d. No, because the evidence used is not (fully) trustworthy
    e. No - the evidence is relevant and trustworthy but it does not support the proposed solution

Appendix 6

Tips for Students on Completing each Section of the Assignment

Tips for Section 1 of the Individual Assignment

Slide 1

- Isolate different problems if there are many (visualize how they are connected, if they are)
- Make the causal model explicit (visualize)
- Critically evaluate causal model: If some steps are unclear, search for hidden assumptions
- Clearly map evidence to specific problem/solution
- Critically evaluate evidence:
  - > Is it relevant?
  - > Is it trustworthy?
  - > Make clear conclusion: does it support the problem/solution?
- Don't offer your own solutions (it's too early!)
- Clearly connect RQ to the missing evidence
- Explicitly answer questions in the guide

Slide 2

- Clearly differentiate between evidence for the problem and evidence for the solution
- Don't confuse assumptions with opinions of the characters
- Don't confuse the temporal sequence of events with the causal model
- Specify the causal model for the solution (and you will see if it can solve the problem / if it is based on hidden assumptions)
- Discussing the evidence: use EBM language to specify what types of evidence are used

Slide 3

- Clearly connect RQ to the missing evidence
- Two types of questions:
  - > For missing scientific evidence > literature search (Section 2)
  - > For missing organisational/practitioner/stakeholder evidence > new data collection (Section 3)
- One question = one intervention + one output
- Think: what answer you may get to the proposed question?
  - > Yes/no answer? > Likely to be too shallow
  - > Only specific direction/type of impact (e.g., only negative or positive)? > likely to be too narrow/one-sided
- If RQ includes context/population: it risks being too narrow for the search of scientific evidence

Tips for Section 2 of the Individual Assignment

Slide 1: Typical Mistakes in Section 2: step-by-step (1)

- Step 2.0: RQ
  - > too vague (intervention or an outcome are not clear)
  - > too overloaded (too many interventions or outcomes in one question)
- Step 2.1: Search strategy
  - > Keywords = PICOC terms related to RQ?
  - > Synonyms?
  - > AND/OR confusion
  - > Exclusion/inclusion criteria:
    - Not relevant: Citations/year limits
    - Missing: meta-analysis/ systematic reviews?

Slide 2: Typical Mistakes in Section 2: step-by-step (2)

- Step 2.2: Selection of papers
  - > Not explained
  - > Missing: CABS rankings/ relevance for your RQ
- Step 2.3: Critical appraisal
  - > Re-tell the papers
  - > Limitations in the paper ≠ "weaknesses"
  - > Conclusions of the paper ≠ "trustworthiness"
- Step 2.4: Conclusions:
  - > No clear answer to the RQ from step 1
- Limited usage of textbook/class materials!

Slide 3: Tips for Step 2.0 of Section 2

- Formulate clear research question that relates to **missing scientific evidence**
- Check the tips on RQ in the slides with tips for Section 1
- Make sure that there is ONE question in your RQ (one intervention + one output)

Slide 4: Tips for Step 2.1 of Section 2: follow the steps for systematic search!

- Break your RQ down into keywords (PICOC);
- Identify the 2 to 4 most relevant keywords. Make sure they all are relevant for your RQ
- Start with the most relevant keyword: search with (TI OR AB);
- Repeat with alternative terms, synonyms or alternate spellings;
- Combine the outcome: (title OR abstract) + (alternative terms) with OR (use the history function!);
- Repeat above steps for keyword 2
- Combine the outcomes with keyword 1 and 2 with AND (use the history function!);
- Use EBM filter for systematic reviews/meta-analyses
- Use EBM filter for empirical work
- Report clearly your search strings (exact words used with exact Boolean operators), inclusion and exclusion criteria, the search outputs (how many search results you received)

Slide 5: Tips for Step 2.2 of Section 2: explain your selection

- Explain clearly why/how you selected the papers for the analysis on step 2.3 from all the search results from step 2.1
- Provide full references of the papers you selected

Slide 6: Tips for Step 2.3 of Section 2: critical analysis of the selected papers

- This section is NOT about re-telling/summarizing the paper
- Start by identifying the RQ of the selected paper and the research method it uses. Do they fit each other? Check the table in the textbook
- Then apply EBM checklists for the quality of the paper
- For each paper, choose the relevant checklist that corresponds to the research method of the paper
- Evaluate each paper separately
- Identify weaknesses according to the checklists (not based on the "Limitations" section on the paper). Based on these, make overall conclusion of the trustworthiness of the findings. Use EBM guidelines
- Evaluate practical relevance (where applicable = effect size in combination with p-value)

Slide 7: Tips for Step 2.4 of Section 2: explain your selection

- This section is NOT about re-telling/summarizing the papers again
- Extract from the papers you reviewed a clear and direct answer to your RQ from Step 2.0: What do all the papers you analysed together tell you about your RQ?

Tips for Section 3 of the Individual Assignment

Slide 1

- Step 3.0
  - > Clearly state your RQ
  - > Refrain from "yes/no" questions
- Step 3.1:
  - > Fit: your RQ vs data collection approach (e.g. cause & effect RQ vs not; qual or quant)
  - > Explain whom specifically you will ask, how you will identify them
  - > Don't repeat generic info re data collection/research design

Slide 2

- Step 3.2
  - > Fit: data collection questions vs your RQ;
  - > Fit: data collection questions vs qual/quant approach;
  - > Qual methods – ask WHY?
  - > "effect" questions – try to avoid, especially for the survey, ask for IV and DV separately
  - > Avoid vague questions
  - > Use scientific literature where relevant (don't "reinvent the wheel")
- Step 3.3
  - > what are strengths and weaknesses of the proposed design? Be specific, do not repeat generic strengths and weaknesses of qual or quant methods, etc

Appendix 7

Teaching Notes for the Case

Bharadwaj (2015). Can a Work-at-Home Policy Hurt Morale? Harvard Business Review, 93(4), 105–109

These are the notes for analysing the case mentioned above following EBM steps (Steps 1.1 – 1.5 of the assignment, Appendix 2). An important disclaimer: these notes to not represent all possible answers to some of the questions. However, I hope that they will give you a sufficient idea on how to approach this particular case – and how you can approach other cases using EBM lens.

Section 1 of the Assignment

Step 1.1: Problems (see also Figure 2 in the main text of the chapter)

- Problem 1: office space limits to company growth
- Logic: fast growth –> office space is at 98% capacity –> risk to lose clients
- Problem 2: only top performers allowed to work-from-home –> performance and salary gaps increased –> people who work in the office are demoralized –> risk of losing employees
- Problem 3: performance bar to availability of WFH is high → employees who can't meet the requirements are in the office → productivity in the office is low

Note that Problem 2 in actually a solution to Problem 1 that the case company has already implemented. The way this solution was designed and implemented caused new problems.

- Hidden assumptions:
  a. All employees want to work from home
  b. All employees have equal opportunities to earn the right to work from home
  c. Competition between employees is good for organisational performance
  d. Work from home is the cause of demoralisation

PICOC: For problem 2:

P – employees who work in the office

I – competitive work from home

C - ? non-competitive work from home? All work from the office? (not clear in the case)

O – employee satisfaction

C – knowledge intensive work, Indian company

Step 1.2: Evidence for the Problem:

THE EVIDENCE FROM THE:	WAS IT USED?	IS IT RELEVANT?	IS IT TRUST-WORTHY?	DOES IT SUPPORT THE PROBLEM STATEMENT?
scientific literature	no	-	-	not applicable
practitioners /experts	yes, refers to problem 2	no	yes	not applicable
most relevant stakeholders	yes, refers to problem 2	yes	no	not applicable
organisation	yes, refers to problem 1	yes	yes	not fully, as we don't have evidence on consequences

Evidence from stakeholders (employees) is not trustworthy, as one of the two employees already works from home. Therefore, evidence from this employee doesn't tell anything about those who work from the office, hence it is not relevant. Therefore, we have only the evidence from one employee out of 500 to support assumption a) above. And this evidence does not support the problem statement 2.

Evidence from practitioners: refers to problem 2, but not relevant because none of them have used competitive work from home programmes, and it seems that in the case company it is the competitive element that creates the problems.

Evidence from organisation: refers to problem 1, we know that there is a growth plan, and that the current office space is at 98% capacity. However, it cannot fully support the problem statement, because we do not have any evidence on the consequences of these (e.g. any clients being lost), and how urgent and serious these are.

Step 1.3: Solutions

- For problem 1: competitive work from home (already implemented). Alternative solutions are not considered.
- For problem 2: a variety of solutions offered:
  a. Cancel the program
  b. Introduce at the slower pace (20 people per 3 months)
  c. Lower the barrier to be eligible for work from home
  d. Clearer criteria of eligibility
  e. Training employees
  f. Pilot in another project

Logic models behind some of these solutions are not clear. E.g., solution B: introduce at the slower pace – how this will change perceptions of unfairness and demoralization? Solutions C and D are expected to decrease competitive perceptions – but the question is would this really work (how strongly they would diminish competitive perceptions?)

Step 1.4: Evidence for the Solution:

THE EVIDENCE FROM THE:	WAS IT USED?	IS IT RELEVANT?	IS IT TRUST-WORTHY?	DOES IT SUPPORT THE PROBLEM STATEMENT?
scientific literature	no	-	-	not applicable
practitioners /experts	yes	no	yes	not applicable
most relevant stakeholders	no	yes	no	not applicable
organisation	no	-	-	not applicable

Evidence from experts counts in this case as evidence from practitioners (rather than opinions), as they indeed have implemented work from home programmes. However, as they don't talk about competitive "work from home", so the relevance/ applicability of this evidence is questionable.

Step 1.5: Missing evidence (=Potential research questions)

- Variety of questions could be asked, e.g. to test the assumptions listed above.
  - > For example, for problem 1:
  - > What are the alternative solutions to problem 1? Compare them in terms of costs and benefits
- For problem 2:
  - > What are the effects of competition among employees on the performance and morale?
  - > Do all employees want to work from home?
  - > What are typical consequences of work from home policy?
  - > What are typical antecedents of employee demoralization?

A Case Exercise for Identifying Claims: Helping EBM Learners to Apply the Four Sources of Evidence

Denise M. Rousseau

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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A Case Exercise for Identifying Claims: Helping EBM Learners to Apply the Four Sources of Evidence

Denise M. Rousseau

The case, "Riparian Healthcare," can be used to help learners identify the variety of claims and assumptions that an organizational decision and change effort can involve. The learning goals of this exercise include:

1. Recognize the claims or assumptions made by organizational decision makers
2. Use the four sources of evidence in EBMgt (Barends & Rousseau, 2018) to identify the kinds of evidence that can help evaluate the trustworthiness of each claim (i.e., the likelihood the claim is true)
3. Identify how the evidence needed to evaluate the claims might be obtained.

CASE: Riparian Healthcare: Implementing Incentive Contracts for Surgeons and Affordable Care Act Reform Measures

Based on a class paper written by

Adam Carlson, Peter Horne, Salinda Kuoponthai & James Langhauser

Background

The passage of the Affordable Care Act (ACA) in 2010 required that American hospitals report their performance on new public metrics. These metrics were intended to improve the patient care quality in American hospitals. One means for attaining this improvement are the incentives ACA created that require the US Federal government to reimburse hospitals for those costs of care the government pays for (i.e., patients covered by Medicare and Medicaid) depending on the hospital's performance on patient care metrics.

Riparian Healthcare, located in the eastern United States, decided to take the challenge of implementing new patient care metrics one step further by introducing changes to the compensation plans of their physicians. These changes would factor physician performance on these metrics into their compensation. Under Riparian's new plan, physician compensation would include both a base salary and a bonus portion tied to metrics put into place by the ACA. The new incentive system gave greater emphasis to quality over the volume of care physicians provide. For example, Riparian used to be reimbursed for every surgery performed. Under the new standards, if the physicians perform repeat surgeries or readmitted a patient for the same condition, the reimbursement request may be denied.

Introducing the Change

Riparian's senior leadership viewed the Affordable Care Act as an opportunity to shift physician priorities to be more in line with what executives referred to as a *patient-centered view* of healthcare. The change to the new compensation system was first announced in a mass email sent by the chief medical officer to Riparian's physicians. A meeting was scheduled to which physicians were invited to discuss the change with upper management. It was poorly attended. Senior leadership established a target date of two months for the establishment of the new incentive system and began informal discussions with hospital physicians.

Physicians were skeptical about the need for the new system and whether the change in incentives would improve care quality. Although generally quite concerned about patient care and open to new ways of doing things if supported by facts, some physicians questioned whether management had evidence to back up the change in incentives.

The change attempted to alter the day-to-day habits of the physicians – senior leaders talked about shifting from the old mindset that every procedure leads to dollars earned to a new mindset where the entire treatment plan contributes to patient outcomes, for which physicians are rewarded. To make the physicians' treatment plans more patient-centered, the change targeted the collection of both patient treatment data and patient feedback on their healthcare experience. Riparian required a complicated, expensive data architecture in order to capture the reimbursements it qualified for under ACA. This new data collection necessitated substantial changes to Riparian's current IT system and data collection/storage capabilities. Different departments required different metrics to accurately reflect the quality of care they provided. However, the system's IT architecture had difficulty accounting for those differences.

Upper management was unaware that the existing IT system and patient care quality reporting procedures could not easily support the change. Senior executives did not think that the change would be that complicated: they believed the current IT systems and existing operations to be sufficient for a smooth transition. However, physicians did not trust the current quality reporting system, which would determine their compensation. Physicians perceived both the IT systems and the personnel entering data often to be inaccurate. The deadline for introducing the new compensation system was fixed by senior leadership and the IT department attempted to accommodate the need for new data capture, analysis, and reporting.

A related challenge was how best to assess the care physicians provided. New metrics were difficult to implement with the organization's existing IT capability. In addition to developing a new IT system to record patient-related data, patient care quality reporting procedures needed to change; and staff would need to be trained to enter these data accurately. Although this training ultimately proved effective, it focused only on the data used for government reimbursement. Other data impacting physician compensation, as in the case of the quality of care for patients covered by private insurance, received little attention in the change plan. The inconsistent quality of the data entered into the current system made it easy for physicians to find errors affecting their compensation, further raising their suspicion regarding the change.

The final challenge was the politics within Riparian. The prevailing sentiment among physicians was that each department was unique. Its services and patients were fundamentally different from those of another department. Basing compensation on standard metrics across Riparian raised considerable anxiety, not the least of which was concern that physicians were losing their ability to practice medicine based on their judgment and expertise.

Implementing the Change

The change in incentives and IT architecture was launched across several practice groups two months after it was announced. Its goal was to bring the whole hospital in line with ACA goals. A problem became immediately apparent: inconsistent implementation by each practice

area's chair. A chairperson led each practice groups (the cardiac unit, the thoracic unit, etc…). Under the "old" system the chair had great bargaining power and autonomy to operate their respective units as they saw fit. The shift away from volume to the quality of care was perceived to reduce the chairmen's judgment and authority. Most area chairs viewed the quality care reporting and data requirements as extra work with no added value.

Practices used different approaches for implementing the change. While some practices had the same set of quality metrics, others differed. Some adopted the new reporting system without changing the physicians' compensation contracts.

Only some of the data administrators were trained in the new system and inaccurate data entries were common. The new reporting systems caused frustration among physicians. The hospital did not keep track of the progress made in implementing the new reporting system. Leadership had little idea which physicians were included in the new reporting system and any problems they experienced with it. Many if not most chairmen perceive the changes as compelled by the Affordable Care Act and not a consensus decision that is best for Riparian. Adoption rate appears to be low but no formal testing has been done to measure what this "adoption rate" might be. Six months into the change, most physicians resisted or ignored the new system, seeing it as another failed initiative.

Aftermath

The change was eventually abandoned and the healthcare organization reverted to the old physician contract system. Considerable frustration remained among physicians that the organization was not doing enough to support their efforts to sustain and improve care quality under the ACA. Slowly the IT patient data reporting system was changed as units within Riparian adjusted to the requirements of the ACA.

Case Presentation and Debrief

Getting started: Ask participants to read the case prior to class. Or, in a single session (e.g., training workshop), have participants read the case at the beginning of the session. (I have done it both ways.)

In-session I introduce some background. I engage the students/participants in a brief discussion of the big picture issues of the case, since the events took place in 2010 in the US and participants may not be familiar with the US healthcare system. I talk about the goals of the Affordable Care Act, including getting more Americans insured for healthcare and improving care quality in hospitals. The focus of the reimbursement system described in the case are those patients whose care is paid for by the US (federal) government, that is, Medicare (older patients) and Medicaid (poor patients).

In-Session Activity: Our first focus is on the assumptions or claims being made by actors in the case. Have students *circle* all the assumptions or claims being made (if they have a hard copy). If they don't have a hard copy, ask them to prepare a list of the assumptions or claims in each section. (The assumptions or claims may be those of senior leaders or other participants like the physicians at Riparian) Numerous claims are made in the case, including:

- physicians need financial incentives to make the effort to improve care quality
- the organization's current quality of care is lower than the standards specified in the ACA
- current patient data reporting system is adequate and effective
- the organization's IT systems are ready and able to support new metrics

Group-Breakout: Using small buzz groups of 2-3, I ask students to compare their lists of assumptions voiced in "Introducing the Change". Which 2-3 seem most critical? Focusing on the most critical, have them identify the kinds of evidence from science, organizational data, stakeholders, or expert judgment that could be gathered to evaluate the trustworthiness of the claim. Important issues include:

Leadership believes physicians are NOT patient-centric in the care they give. Is there evidence the physicians are NOT patient-centered? What forms might that take? How could we evaluate that claim? Science, organizational evidence, stakeholder perspectives, expertise?

(Since the claim is specific to this group of physicians, it would be most appropriate to gather information from physicians (stakeholders) themselves to assess their values and priorities.)

Leadership believes Riparian will improve its reimbursements if it compensates physicians differently. How can this claim best be evaluated?

(Several kinds of evidence could be relevant here. First, organizational evidence can indicate what the reimbursement rates would be under current levels of care quality. From this information, Riparian leadership can learn what would be the expected reimbursement rates given Riparian's current metrics for Medicare and Medicaid patients. This would inform them on the expected difference in reimbursement under conditions of successful change implementation. Second, what is the role of financial incentives in shaping physician care quality generally? This is a question that scientific evidence might answer. Note that incentives often have direct effects on performance quantity, their role in performance quality is less consistent or clear. Third, physicians themselves may have insight into the factors affecting the quality of care they give. Stakeholder evidence using focus groups and other data gathering techniques could be useful.)

Learning Goals: Learners come away with the idea that claims and assumptions abound in everyday life and importantly in organizational decisions. Identifying claims, and then linking claims to appropriate sources of evidence to evaluate their trustworthiness are foundational skills in EBM. These skills can be reinforced in subsequent cases and class discussion.

About the Author

Denise M. Rousseau is the H.J. Heinz II University Professor of Organizational Behavior and Public Policy at Carnegie Mellon. She is Academic Board President, Center for Evidence-Based Management, and Co-Chair, Campbell Collaboration, Management and Business Coordinating Group (MBCG). Rousseau's research focuses upon the impact workers have on the employment relationship and the firms that employ them. Her publications include over a dozen books and over 230 articles and monographs in management and psychology journals. Rousseau is a two-time winner of the Academy of Management's Terry Award for best management book for *I-Deals: Idiosyncratic Deals Workers Bargain for Themselves in 2006 and Psychological Contracts in Organizations: Understanding Written and Unwritten Agreement* in 1995.

She has served as President of the Academy of Management and Editor-in-Chief of the *Journal of Organizational Behavior*. Rousseau received her A.B., M.A. and Ph.D. from the University of California at Berkeley. Rousseau founded the Evidence-Based Management Collaborative, a network of scholars, consultants, and practicing managers to promote evidence-informed organizational practices and decision making. Her book *Evidence-based Management: How to Use Evidence to Make Better Organizational Decisions* with Eric Barends (Kogan Page) is also available for teachers and students in the on-line course in EBMgt at https://oli.cmu.edu/courses/evidence-based-management-o-f/.

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Teaching Notes for Eckford Sterling Corporate Banking: Learning from Responses to a Financial Crisis

Eric Barends and Denise M. Rousseau

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Teaching Notes for Eckford Sterling Corporate Banking: Learning from Responses to a Financial Crisis

Eric Barends and Denise M. Rousseau

Introduction

Eckford Sterling Corporate Banking, headquartered in London, is one of the world's largest banking and financial services institutions with around 220,000 full-time employees serving more than 40 million customers. Its commercial investment, retail and private banking units operate in over 80 countries and its total revenue for last year was $66 billion USD. The Financial Stability Board (FSB), an international body that monitors the global financial system, rates Eckford Sterling as a 'systematically important financial institution' (SIFI) – a bank that is considered too big to fail.

The Global Financial Crisis in 2008 dramatically increased the attention that financial regulators paid to the practices of 'SIFI' banks like Eckford Sterling. In looking back on the Crisis, regulators tried to identify its major causes. One possible cause they identified was the failure of risk management. Failed risk management is cited as evident in activities like money laundering, misleading investors regarding risks in various financial instruments, and actual market rigging. Industry regulators concluded that this risk management failure resulted from what they refer to as a "weak risk culture," where banking employees are encouraged to take irresponsible risks.

In 2009 and again in 2011, the FSB advised banks to have a "sound risk culture." In a guideline distributed to banks worldwide, the FSB stated that to improve their risk culture, banks should pay attention to the following factors:

ELEMENTS OF A SOUND RISK CULTURE

- Risk governance
- Risk appetite
- Compensation

INDICATORS OF A SOUND RISK CULTURE

- Tone from the top
- Accountability
- Effective communication and challenge
- Incentives

It took a while for the issues raised by the FSB to be taken up by local regulatory authorities in each country. For example, the Financial Conduct Authority in the UK began raising the issue of risk culture in 2013. When they did, Eckford Sterling's executives realized that regulators were getting serious.

The bank's response was to roll out a 'Global Risk Culture Program' (GRIC). The Program began with the hiring of an experienced consultant who had worked on risk culture at another major bank as the program director. The GRIC program team, comprising 10 experienced executives from various parts of the organization, decided to first target risk management issues in Market Operations.

Persistent Errors in Market Operations

In the investment banking division (one of Eckford Sterling's most profitable divisions with an annual revenue of about 2,8 billion USD), trades made by investment bankers in the 'front office'

are processed by the 'back office', also referred to as 'Market Operations'. Employees at Market Operations confirm and log the trades into the system and transfer the associated funds to the clients' accounts. Senior executives in the investment banking division were concerned with the number of transactional errors made in processing trades.

Transactional errors take a variety of forms. Money can be transferred to the wrong account, a client could be charged more than the agreed upon fee, or a trade might go unconfirmed or not be booked into the system. One particularly troublesome error is setting a trade deal on the wrong date or time, which can create costly problems when the exchange rate or share price changes in the meantime. As a result, sometimes the bank loses money due to the error, and on other occasions it makes money - depending on the direction of changes in exchange rates or share prices.

Each month Market Operation executives receive "incident reports" describing errors that have altered outcomes for the bank by $20,000 USD or more. Organizational data showed that each year 30-40,000 trades are processed through Markets Operations. In the first quarter of 2015 a total of 45 incident reports were filed. The incident reports only involve 20k or more, less consequential errors are not reported. Some experts within Eckford Sterling believed these 'minor' errors may be greater by a factor of at least 10.

Incidents reports describe the nature and impact of the error, as well as the Market Operations section or team involved. Reading through these incident reports, the GRIC program team felt that most of the 45 errors seemed to be preventable due to weaknesses in "people" aspects such as risk awareness, diligence, compliance, and judgement. In addition, the reports seldom indicated that any attempt to learn or improve had been made. The team felt that at other banks such mistakes might have generated alerts and follow ups directed at process improvements. The team therefore concluded that the number of errors and the way they were handled reflected a lack of risk awareness and a weak risk culture within Market Operations.

To improve risk awareness and strengthen Market Operations' risk culture, the GRIC program team developed the 'Eckford Sterling Risk Culture Framework,' which reflects the elements and indicators of a sound risk culture as stated in the FSB guideline. Based on this framework, a Risk Culture Questionnaire was developed – a self-assessment for teams and individual employees - to identify strengths and weaknesses. The outcome was used to initiate meetings and workshops in which the importance of compliance to risk management standards was addressed.

Notes For Instructors

Background

This case describes an international bank considered "too big to fail"by the regulators. After the 2008 crisis, the FSB began to more actively intervene and advised banks how to avoid such crises in future. It produced a report https://www.fsb.org/wp-content/uploads/140407.pdf widely disseminated

among banks, concluding that the financial crisis was due to the absence of a *sound risk culture.* The report argues that proper levels of accountability and "tone at the top" can ensure that undue risks are avoided in banking practices and decisions. Students can be given this document (linked above) to see how this regulatory responded post-crisis. (Note the absence of advice citing evidence from behavioral scientists or organizational development scholars regarding risk reduction)

Three Approaches to Teaching EBM Using This Case

This case can be presented from different angles depending on the focus and level of the class:

- ***In an executive course***, the case analysis is comprehensive, focusing on assumptions, problem identification, additional sources of evidence that should be acquired, and how to aggregate and apply the evidence in an action plan.
- ***In a graduate course***, the case can be used over multiple weeks: first week, to focus on assumptions and problem definitions, and second week, to identify critical sources of more trustworthy evidence and how that evidence might be acquired and used.
- ***In a session dedicated to learning how to access relevant scientific evidence for practical problem solving***, the case can be used to help students seek out relevant scientific evidence on risk culture vs safety climate or risk management and error reduction.
- ***In a short course on the EBM Approach to Organizational Data***, the case can be used as an example of (mis)use of organizational data. Students identify more trustworthy and useful ways of gathering, reporting, and structuring organizational data to provide evidence for decision makers.

A general approach to analyzing this case in an EBM course: Problem Analysis/Solution Identification

In both executive and graduate courses on EBM, class discussion focuses on overall assessment, diagnosis, problem identification, and follow up EBM steps.

Two factors loom large in the bank's environment: Concerns regarding bank operations and outcomes grounded in its experiences with the 2008 Financial Crisis and the regulatory pressure following the Crisis. The organization's leaders are pulled in several directions, learning from the own mistakes and problems the Crisis made salient, and responding to the pressures from its regulators, particularly those directly experienced by its UK headquarters.

Some fundamental questions to raise with the class:

- What is the problem being solved? How serious and urgent is this problem? What are its organizational consequences? What happens when nothing is done?

- What is the presumed main cause for this problem? What are assumptions held by the GRIC Program Team? How does the logic model look like?
- What is the evidence for the assumed main cause? Were all four sources consulted? How trustworthy is the evidence? How complete is the evidence?
- Could there be plausible alternative causes for the problem? What type of evidence and from which sources would you need to determine this? How could you acquire this evidence?

Points for Discussion: Problem Definition

The main problem Eckford Sterling is trying to solve is twofold: 1) regulators have increased the requirement for systemically important financial institutions (SIFIs) to assess and strengthen their company's 'risk culture'; 2) the GRIC Program Team view that a significant proportion of errors made within Markets Operations are preventable and 'feel' that this is partly due to a weak risk culture. However, to limit the scope of the case it is advised to focus on the latter. Points to discuss are:

- It is unclear whether the number of errors made within Market Operations constitutes a problem. The organizational data suggests that the error rate is somewhere between 0,4 and 0,6%. Although it is unclear what the average error rate in the sector is, this number seems rather small. In addition, it is unclear how much money this involves: sometimes the error is in favor of the bank, sometimes in favor of the client. Also, is the error rate significant given the trade volume? At present, the bank's executives have no clear sense of the impact these errors have on the organization.
- It is unclear whether a weak risk culture is the main reason why errors are being made: no scientific was consulted (are there empirical studies suggesting that a weak risk culture and making errors is related?) and the experiential evidence (the 'views' and 'feelings' of the members of the GRIC Program Team) was not acquired in a systematic, unbiased way. In addition, both the Risk Culture Framework and the Risk Culture Questionnaire that were used to assess the teams within Market Operations were self-designed, and the latter's psychometric qualities are unknown. It is therefore uncertain whether the questionnaire is reliable and valid (i.e. measures what it claims to measure). Thus, the available evidence is too limited to draw conclusions regarding the problem's assumed cause.

Class discussions should surface the disturbing fact that the bank's risk exposure is largely unknown: it is unclear whether there is a serious and urgent problem – more evidence is needed to determine

whether (and what) changes are needed. If the discussion of the case would stop with these general questions, we suggest you give students the opportunity to discuss the following:

Points for Discussion: Sources of Evidence

1. Scientific Evidence

Regulators strongly believe in the need for a strong risk culture. But what is the scientific evidence for "risk culture". In particular, is there scientific evidence indicating that a strong risk culture prevents people from making errors during operational procedures - are there empirical studies available demonstrating a relationship? If so, how strong is this relationship? What other questions would you like to ask of the scientific evidence relevant to this case?

Note: An evaluation of the scientific literature, conducted by CEBMa, revealed that studies on the effect of risk culture on incidents are noticeably absent, and validated measurement tools are not available. However, considerable research exists on risk or safety climate that might be useful. (See CEBMa REA on Safety Climate)

2. Local Evidence - Organizational Data

In this case the data are incomplete and uninterpretable as they are presented without a base rate or comparators and are limited to only some of the errors occurring in Market Operations. Class discussion could therefore focus on the strengths and weaknesses of the error reporting system:

- How many of the actual incidents of errors are really reported? In the safety climate literature, the first goal of interventions tends to be to increase the reporting of incidents. We know from safety climate research that error reporting tends to be poor when safety climate is poor.
- Note: The executives in this case had no information on trends within the bank since a central repository for reporting errors was begun only some months ago. In fact, to date only a few Market Operation locations report to that central repository based in London. Some report in one system is send to London, others report in a different system that then directly reports into the central repository. In addition, no data exist on trends or incidents of problem in the banking sector. The executives had no knowledge about the average error rate in the sector because such data are treated as proprietary.

3. Stakeholder Evidence

What might be stakeholder concerns? Employees are not consulted yet they may have insights into both the quality of the operations, the transparency of decisions, and sources of transaction errors (see also below).

4. Practitioner Evidence

What does practitioner evidence suggest? Note that it is the managers who have worked at other banks outside of Eckford Sterling who recognize problems in its processes. And what about the GRIC program director – the case states that this was an experienced consultant who had worked on risk culture at another major bank. Do they have information regarding promising practices for error reduction and risk management that could be useful?

Points for Discussion: Alternative Explanations

It is obvious that many plausible alternative explanations for the assumed problem exist. To prevent students from going on a wild goose chase the discussion should therefore focus on the following questions:

1. What is known from the scientific evidence literature about the main causes (antecedents/predictors) for people making mistakes during operational procedures?
2. What do the employees and other stakeholders see as plausible alternative explanations for the errors made within Market Operations? How would you acquire this information (focus groups, a survey?)

Final Thoughts and Activities

This case is meant to exemplify how an evidence-based approach can be used to identify and solve problems in real-life organizations. The main takeaway is that Eckford Sterling's leadership did not make the effort to collect evidence from multiple sources and instead made changes without having a clear problem definition or implementation process in mind. As such, the case illustrates that when the cause and impact of an (assumed) problem are unknown and the organization's own data gathering is not well-designed, it is difficult to chart an effective course of action. Although this conclusion is correct, it will most likely draw reactions from students such as 'Ok, now what?' For this reason, it is important to provide a short record of how this case proceeded. Below, an overview of the follow-up steps and insights gained is provided:.

- Based on the above observations, CEBMa evaluated several scientific studies on errors/incidents in healthcare, aviation and the nuclear industry. The outcome of this evaluation shows that distraction/task interruptions are the number one predictor of

people making mistakes during operational processes. In fact, interruptions can have devastating consequences in a work environment: multiple-plane crashes have been attributed in part to interruptions to the pre-flight checklist procedures, and several studies suggest that even fairly simple distractions tend to increase major medical mistakes eightfold. For this reason, evidence-based practices such as 'no interruption zones' and 'distraction-free environments' are being applied in many industries.

- The second most important predictor of people making mistakes is an organization's 'safety climate'. High-risk industries such as aviation, nuclear energy, the offshore oil industry and hospitals pay considerable attention to assessing risk and safety concerns. Driven by the awareness that organizational, managerial and human factors rather than technical failures are prime causes of accidents, these industries focus on predictive measures of safety. One particular focus is the evaluation of an organization's 'safety climate', a term that generally refers to the measurable components of risk/safety 'culture'. Research has demonstrated that management behavior, risk perception, job demands, reporting/speaking up, safety attitude and communication/feedback are the essential components of a 'sound' safety climate. Meta-analytic studies show that these components offer a robust prediction of safety outcomes (things going wrong) across industries and countries. In fact, safety climate dimensions have also been shown to predict risk behavior.
- Given the lack of practitioner and stakeholder evidence, a panel discussion was organized with 25 risk- and compliance managers from eight international locations. During the discussion, the managers explained that, to reduce costs, a large part of Market Operations was moved to cities in low-income countries such as India, Paki-

stan, and Bangladesh about a year ago. Although the labor costs were low, the working conditions at these locations were very poor (see picture below). According to the managers, these locations also had the highest error rates.

- When confronted with the scientific evidence on errors, task interruptions, and safety climate, the risk and compliance managers, as well as the members of the GRIC Program Team and Eckford Sterling's leadership team, acknowledged that task interruption and work climate are a more plausible (and evidence-based) explanation than a weak risk culture. Based on this consensus, evidence from multiple sources was consulted to identify interventions aimed at reducing distractions and task interruption. This evidence suggested that:

- The most common disruptions come from co-workers. Face-to-face interruptions account for one-third more intrusions than email or phone calls, which employees feel freer to ignore. Not surprisingly, employees in open-plan offices are interrupted more often than those in private offices (estimates range from 20 to 30%). Market Operations' units with poor working conditions therefore installed 'no-interruption zones', using red floor tape or different colored floor tiles. This solution was adapted from the airline industry's so-called 'sterile-cockpit rule', which prohibits interrupting pilots during critical times, such as takeoffs and landings.

- In addition, meetings and workshops were held with employees from Market Operations involved in high-risk processes to educate them about the primary causes of human errors.

- Finally, based on a review of the scientific literature, the GRIC Program Team adapted a validated questionnaire on Safety Climate, and used it as a diagnostic tool to assess all teams within Market Operations.

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Teaching Evidence-Based Management: Goals, Objectives & Skills

Eric Barends and Denise Rousseau

SUPPORTING EVIDENCE-BASED MANAGEMENT EDUCATORS

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Teaching Evidence-Based Management: Goals, Objectives & Skills

Eric Barends and Denise Rousseau

Whether you design a course or program from scratch or integrate elements of evidence-based management into an existing curriculum, the first step is to determine the learning outcomes. What should students know, understand, or be able to do after they have completed the course?

Determining learning outcomes serves several purposes, such as:

1. FOCUS	Learning outcomes provide a clear focus and direction for both the instructor and the students. They outline the key knowledge and skills that the course aims to impart, ensuring that the content is aligned with these goals.
2. ASSESSMENT	Learning outcomes serve as a basis for designing assessments and evaluations. They provide criteria against which student performance can be measured, ensuring alignment between what is taught and what is assessed, making the assessment fair and relevant.
3. STUDENT EXPECTATIONS	Clearly defined learning outcomes help students understand what is expected of them and what they will gain from the course. This can enhance student motivation and engagement.
4. QUALITY STANDARDS	Learning outcomes are essential for meeting accreditation standards and ensuring the quality of education. They provide evidence that the course meets certain educational benchmarks.
5. CONTINUOUS IMPROVEMENT	Learning outcomes facilitate continuous improvement in teaching and learning. They provide a framework for evaluating the effectiveness of the course and making necessary adjustments to improve student learning.

Often a distinction is made between learning goals, learning objectives, and skills.

LEARNING GOALS	Broad, general statements about what the program or course intends to accomplish. They set the direction and intent of an educational experience and provide a framework for more specific learning objectives. They are aspirational and might not be directly measurable.
LEARNING OBJECTIVES	Specific, measurable statements describing what students will be able to do upon completion of the program or course. Unlike goals, learning objectives are precise and measurable, allowing educators and students to evaluate whether the learning goal has ???
SKILLS	Practical abilities or competencies that students need to master to achieve the broader learning objectives and, ultimately, the learning goals. Skills are inherently practical and are developed through practice and application in various contexts. Skills are not restricted to inclusion in only one learning objective, though every learning objective has at least one skill.

On the next pages, a checklist of the learning outcomes—goals, objectives, and skills—specified in CEBMa's evidence-based management framework is provided. This checklist can serve as a reference when designing a course or program on evidence-based management.

CEBMa's Evidence-Based Management Framework

EBMgt Steps	Evidence Sources			
	A. Practitioners (professional expertise)	**B. Scientific Literature** (empirical studies)	**C. Organization** (local data)	**D. Stakeholders** (value and concerns)
0. AWARE	Step 0			
1. ASK	Step 1			
2. ACQUIRE	Step 2A	Step 2B	Step 2C	Step 2D
3. APPRAISE	Step 3A	Step 3B	Step 3C	Step 3D
4. AGGREGATE	Step 4			
5. APPLY	Step 5			
6. ASSESS	Step 6			

STEP 0: AWARE - What Is EBMgt And Why Do We Need It?

LEARNING GOAL 0: Explain what evidence-based management is and why we need it			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
0.1. Summarize the basic principles of evidence-based management	0.1.1. Naming the most important elements of evidence-based management		
	0.1.2. Explaining what counts as evidence		
0.2. Explain the need for evidence-based management	0.2.1. Explaining why we need evidence-based management and provide examples		
0.3. Identify the four sources of evidence and provide examples of each	0.3.1. Giving an example of each source of evidence		
	0.3.2. Determining which sources of evidence were consulted in a decision-making process		
0.4. Evaluate (coarsely and in general terms) the quality of evidence	0.4.1. Assessing (coarsely and in general terms) the quality of evidence		
0.5. Determine whether the 'best available' evidence was used in a decision-making	0.5.1. Ranking the quality of evidence / Identifying the 'best' available evidence		
	0.5.2. Explaining what 'best available' evidence means		
0.6. Correct common misconceptions about evidence-based management	0.6.1. Identifying common misconceptions about evidence-based management		

STEP 1: ASK - Critical Questions About Assumed Problems and Preferred Solutions

LEARNING GOAL 1: Identify the need for evidence and translate this into an answerable question			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
1.1. Identify claims/assumptions/hypotheses regarding a practical issue	1.1.1. Identifying claims/assumptions/ hypotheses regarding a practical issue		
1.2. Determine what the (assumed) problem is for which the evidence should be consulted.	1.2.1. Asking questions to determine what the (assumed) problem is for which the evidence should be consulted		
	1.2.2. Determining whether the (assumed) problem is sufficiently clear		
1.3. Use the PICOC method to make explicit the organizational context that should be taken into account	1.3.1. Applying the PICOC method to make explicit the organizational context		
1.4. Formulate questions to determine whether the (assumed) problem is supported by evidence from multiple sources	1.4.1. Determining whether there is sufficient evidence (from multiple sources) to support the (assumed) problem		
1.5. Determine what the preferred solution is for which the evidence should be consulted.	1.5.1. Determining whether the solution is sufficiently clear		
1.6. Formulate questions to determine whether the preferred solution is supported by evidence from multiple sources.	1.6.1. Determining whether there is sufficient evidence (from multiple sources) to support the preferred solution		

STEP 2A: ACQUIRE - Evidence From Practitioners

LEARNING GOAL 2A: Systematically search for and/or retrieve evidence from practitioners			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
2A.1. Acquire evidence from practitioners in a valid and reliable way	2A.1.1. Determining what evidence to acquire from practitioners (REMOVED)		
	2A.1.2. Determining how to prevent selection bias when acquiring evidence from practitioners		
	2A.1.3. Determining the best method(s) to acquire evidence from practitioners		
	2A.1.4. Determining whether bias could have affected evidence from practitioners		
	2A.1.5. Formulating clear, unambiguous, and unbiased questions		

STEP 3A: APPRAISE - Evidence From Practitioners

LEARNING GOAL 3A: Critically judge the trustworthiness of evidence from practitioners			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
3A.1. Determine whether professional expertise is valid and reliable	3A.1.1 Assessing whether professional experience is valid and reliable		
	3A.1.2. Ranking the trustworthiness of professional experience		
3A.2. Identify/recognize system 1 and system 2 thinking	3A.2.1. Recognizing how system 1 thinking influences valid and reliable professional expertise		
	3A.2.2. Differentiating between system 1 and system 2 thinking		
	3A.2.3. Determining whether a decision is based on system 1 or system 2 thinking		
3A.3. Identify/recognize common cognitive biases	3A.3.1. Recognizing common cognitive biases		
3A.4. Propose measures to overcome cognitive biases	3A.4.1. Identifying ways cognitive biases can be overcome		

STEP 2B: ACQUIRE - Evidence From The Scientific Literature

LEARNING GOAL 2B: Systematically search for and / or retrieve evidence from the scientific literature			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
2B.1. Determine the best place to search for empirical studies relevant to the question	2B.1.1. Determining the most relevant online research database(s) given the question		
	2B.1.2. Explaining the benefits and limitations of peer reviewed journals		
	2B.1.3. Determining whether a journal is peer reviewed		
	2B.1.4. Determine whether a quick and pragmatic search suffices or if an extensive, rigorous search is required		
2B.2. Identify effective search terms to search for relevant empirical studies in an online research database	2B.2.1. Determining the most important PICOC terms		
	2B.2.2. Searching the Internet for relevant alternative and/or related terms		
	2B.2.3. Identifying corresponding academic terms by searching a database's Thesaurus or Google Scholar		
	2B.2.4. Identifying broader underlying principles by searching Google Scholar		
	2B.2.5. Testing search terms to identify terms that yield the most relevant results		

2B.3. Conduct a systematic and reproducible search for empirical studies in online research databases	2B.3.1. Applying Boolean operators to specify a search query		
	2B.3.2. Using the truncation sign to broaden the scope of a search query		
	2B.3.4. Using the history function to combine search queries		
	2B.3.5. Apply methodological filters to identify meta-analyses and longitudinal/ controlled studies		
	2B.3.6. Narrowing search results by adding additional PICOC terms		
	2B.3.7. Limiting a search result by limiting the date range		

STEP 3B: APPRAISE - Evidence From The Scientific Literature

LEARNING GOAL 3B: Critically judge the trustworthiness of evidence from the scientific literature			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
3B.1. Determine whether a study meets the standards of good science	3B.1.1. Assessing whether a study was conducted according to the scientific method		
	3B.1.2. Assessing whether a study was replicated		
	3B.1.3. Assessing whether a study was submitted to peer review		
3B.2. Determine whether a study's findings are practically relevant	3B.2.1. Assessing whether a statistically significant finding is of practical relevance		
	3B.2.2. Assessing the impact of an effect size		
3B.3. Determine whether bias, confounding or effect modification may have affected the results	3B.3.1. Recognising common methodological biases		
	3B.3.2. Assessing whether methodological bias may have affected the results		
	3B.3.3. Describing how researchers can minimize methodological bias		
	3B.3.4. Assessing whether confounders may have affected the results		
	3B.3.5. Assessing whether a placebo effect may have affected the results		
	3B.3.6. Identifying moderators or mediators that may have affected the results		

3B.4. Determine a study's research design	3B.4.1. Distinguishing quantitative research methods from qualitative research methods		
	3B.4.2. Identifying a study's research design		
3B.5. Eficiently read a research article	3B.5.1. Describing how to efficiently read a research article		
3B.6. Determine the precision of a finding or outcome	3B.6.1. Assessing whether a confidence interval is sufficiently narrow		
3B.7. Determine whether an outcome was measured in a reliable way (see also 6.5)	3B.7.1. Analysing whether measurement error is likely to occur		
	3B.7.2. Assessing whether an outcome was measured in a reliable way		
3B.8. Determine a study's methodological appropriateness	3B.8.1. Distinguishing cause-and-effect questions from non-effect questions		
	3B.8.2. Identifying the type of research question a study aims to answer		
	3B.4.2. Identifying a study's research design		
	3B.8.3. Assessing whether a study design meets the three criteria of causation		
	3B.8.4. Assessing whether a study's research design is appropriate given the research question		
3B.9. Determine a study's methodological quality	3B.9.1. Assessing a study's methodological quality on the basis of pre-determined criteria		
3B.10. Grade a study's trustworthiness	3B.10.1. Grading a study's trustworthiness on the basis of it's methodological appropriate-ness and quality		
	3B.10.1. Summarizing a study's design, find-ings, and weaknesses		

STEP 2C: ACQUIRE - Evidence From The Organization

LEARNING GOAL 2C: Systematically search for and/or retrieve evidence from the organisation			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
2C.1. Acquire evidence from the organisation in a valid and reliable way	2C.1.1. Explaining the importance of organizational evidence		
	2C.1.2. Distinguishing data, from information and evidence		
	2C.1.3. Determining what organizational evidence to acquire		
	2C.1.4. Determining what types of organizational evidence are available and where they are kept		
	2C.1.5. Distinguishing 'normal' data from Big Data		
	2C.1.6. Determining where to find relevant organizational evidence		
	2C.1.7. Determining whether the evidence concerns operational data, metrics, KPIs or benchmarks		
	2C.1.8. Explaining the difference between descriptive and inferential measures		
	2C.1.9. Identifying potential barriers to acquire organizational evidence		

STEP 3C: APPRAISE - Evidence From The Organization

LEARNING GOAL 3C: Critically judge the trustworthiness of evidence from the organization			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
3C.1. Determine whether a logic model was used to collect and anaylze evidence from the organization	3C.1.1. Identifying the elements of a logic model		
	3C.1.2. Putting the elements of a logic model together in a logical and sequential order		
	3.C.1.3. Using a logic model to determine which organizational data to collect		
3C.2. Determine whether organizational data are relevant	3C.2.1. Assessing whether organizational data are relevant		
3C.3. Determine whether organizational data likely to be relevant	3C.3.1. Identifying steps in the collection and processing of data that could introduce risk of inaccurate data		
3C.4. Determine whether contextual information is missing	3C.4.1. Assessing whether (and if so, what) additional contextual information is needed		
3C.5. Determine whether there could be measurement error	3C.5.1. Assessing whether measurement error is likely to occur		
	3C.5.2. Describing possible causes or measurement error		
	3C.5.3. Identifying metrics or KPI's that are difference-scores		
3C.6. Determine whether there could be a small number problem	3C.6.1. Identifying a small number problem		

3C.7. Determine whether a metric is a good representation of the data	3C7.1. Explaining the difference between relative and absolute change/difference		
	3C.7.2. Assessing which average (mean, median or mode) represents the data best		
	3C.7.3. Interpreting a metric's standard deviation		
3C.8. Determine whether a graph is a good representation of the underlying data	3C.8.1.Assessing whether a graph represents the data in a valid and reliable way		
3C.9. Determine whether a correlation- or regression coefficient is practically relevant	3C.9.1.Calculating and assessing the variance explained (r-squared) of a correlation coefficient		
	3C.9.2. Calculating and assessing the goodness of fit (multiple R-squared) of a regression coefficient		
	3C.9.2.Interpreting a correlation or regression coefficient		
3C.10. Determine whether a correlation- or regression coefficient may be misleading	3C.10.1. Assessing whether there are outliers that may distort the results		
	3C.10.2. Assessing whether range restriction may have affected the results		
3C.11. Determine the precision a finding or outcome	3C.11.1. Assessing whether a confidence interval is sufficiently narrow		

STEP 2D: ACQUIRE - Evidence From The Stakeholders

LEARNING GOAL 2D: Systematically search for and/or retrieve evidence from the organization			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
2D.1. Acquire evidence from relevant stakeholders in a valid and reliable way	2D.1.1. Identifying and assessing evidence from stakeholders		
	2D.1.2. Identifying and distinguishing different types of stakeholders		
	2D. 1.3. Identifying the most relevant stakeholders		
	2D. 1.4. Determine which stakeholders could be affected by a decision		
	2D. 1.5. Determine which stakeholders could affect a decision, its implementation, or its outcome		
	2D. 1.6. Determine how to acquire evidence from stakeholders		

STEP 3D: APPRAISE - Evidence From Stakeholders

LEARNING GOAL 3D: Critically judge the trustworthiness of evidence from stakeholders			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
3D.1. Assessing whether evidence from stakehoders is valid and reliable	3D.1.1. Explaining why stakeholders' subjective feelings and perceptions should always be taken into account		
	3D.1.2. Determining the practical and/or ethical impact a decision may have on stakeholders		
	3D.1.3. Determining whether relevant stakeholders can freely express their views and feelings regarding a (proposed) decision		
	3D.1.4. Determining whether there could have been selection bias in the way evidence from stakeholders was obtained		
	3D.1.5. Identifying factors that may affect the trustworthiness of evidence from stakeholders		

STEP 4: AGGREGATE - Weighing And Pulling Together The Evidence

LEARNING GOAL 4: Weigh and pull together evidence from multiple sources			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
4.1. Apply Bayes Rule to determine whether the available evidence supports a claim/ assumption/hypothesis	4.1.1. Explaining what proof, evidence, chance, and 'conditional' probability means		
	4.1.2. Assessing the impact of a prior probability		
	4.1.3. Estimating the likelihood of the evidence: P(E|Htrue) and P(E|Hfalse)		
	4.1.4. Calculating the impact of the likelihood of the evidence		
	4.1.5. Updating the probability of a hypothesis when new evidence comes available		
	4.1.6. Aggregating evidence from multiple sources and calculating the probability of a hypothesis		

STEP 5: APPLY - Incorporating The Evidence Into Practice / The Decision-making Process

LEARNING GOAL 5: Incorporate the evidence into practice / the decision-making process			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
5.1. Determine whether the evidence applies to the organizational context	5.1.1. Using the PICOC method to determine whether the evidence applies to the organizational context		
5.2. Determine a decision's costs and benefits	5.2.1. Calculating a decision's expected value		
	5.2.2. Determining whether a decision / intervention gives you the biggest bang for your buck		
	5.2.3. Assessing the level of risk inherent in a decision/intervention		
	5.2.4. Identifying ethical issues that need to be considered		
5.3. Determine whether the evidence is actionable	5.3.1. Determining whether (and if so, how) the evidence is actionable		
5.4. Determine whether moderators need to be taken into account	5.4.1. Identifying potential moderators		
5.5. Determine, given the type of decision at hand, how and in what form the evidence can be applied	6.1.1. Differentiating between routine, non-routine and novel/hyper complex decisions		
	5.5.1. Determining in what forms evidence can be applied given the type of decision being made		

STEP 6: ASSESS - Evaluate The Outcome Of The Decision Taken

LEARNING GOAL 6: Assess Evaluate the outcome of the practice / decision taken			
Learning Objectives	**Skills**	**Instructional Activity**	**Assessment Y/N?**
6.1. Identify the type of decision (to be) made	6.1.1. Differentiating between routine, non-routine and novel/hyper complex decisions		
6.2. Determine whether a decision was executed as planned	6.2.1. Assessing whether the outcome of a decision may be influenced by a lack of implementation fidelity		
6.3. Assess an outcome using the gold standard method	6.3.1. Determining whether an outcome assessment entailed a premeasure, a control condition and/or random assignment		
	6.3.1. Suggesting ways to improve the validity and reliability of an outcome assessment		
6.4. Assess an outcome using quasi- or non-experimental methods	6.4.1. Suggesting ways to assess an outcome using quasi- or non-experimental methods		
	6.4.2. Suggesting ways to improve the validity and reliability of an After Action Review		
6.5/3B.7 Determine whether an outcome was measured in a reliable way	3B.7.2. Assessing whether an outcome was measured in a reliable way		
	6.5.1. Assessing whether indirect and intangible costs were taken into account		
6.6. Assess stakeholder effects	6.6.1. Assessing the (unintended) consequences of a decision on stakeholders		

CEBMa Evidence-Based Management Teaching Handbook

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