

Causes of the Decline of the Business School Management Science Course

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Abstract

The business school management science course is suffering serious decline. The traditional model- and algorithm-based course fails to meet the needs of MBA programs and students. Poor student mathematical preparation is a reality, and is not an acceptable justification for poor teaching outcomes. Management science Ph.D.s are often poorly prepared to teach in a general management program, having more experience and interest in algorithms than management. The management science profession as a whole has focused its attention on algorithms and a narrow subset of management problems for which they are most applicable. In contrast, MBA's rarely encounter problems that are suitable for straightforward application of management science tools, living instead in a world where problems are ill-defined, data is scarce, time is short, politics is dominant, and rational "decision makers" are non-existent. The root cause of the profession's failure to address these issues seems to be (in Russell Ackoff's words) a habit of professional introversion that caused the profession to be uninterested in what MBA's really do on the job and how management science can help them.

"Management Science is incredibly useful"

- CEO of a management science consulting firm

"Magical Science is a waste of time"

- Business student proverb

There is a troubling dichotomy in management science. The practice of management science is

alive and well, even booming. The journal *Interfaces* is full of articles describing the valuable impact of management science on business, government and public policy. Management science applications such as revenue management have made management science central to corporate strategy. The annual Edelman Prize competition in *Interfaces* showcases multi-million dollar management science success stories.

Simultaneously, management science is in serious decline in many business schools. In fact, the required management science course has been eliminated from many MBA programs. At other schools, required management science requirements are being reduced or are under threat. Even successful non-traditional courses are being shrunk, and the process is ongoing. Although a small and growing number of success stories that suggest it is possible to reverse this trend (including Bell 1997, Bodily 1996, Carraway and Clyman 1997, Liberatore and Nydick 1999, Powell 1995, Sonntag and Grossman 1999 and Winston 1996), the decline appears to be continuing at most schools.

It is tempting for an instructor to read the success stories mentioned above and imitate them in anticipation of similar success. Although this may improve the situation in the short run, it is not sufficient. As I shall show, the forces causing the decline of the business school management science course have been building for decades. Rather than rush to a solution, it is important to pause and give careful attention to the origins of the decline. Instructors must understand the root cause of the difficulties in order to reverse—not merely arrest—the decline.

Understanding the origins of the precipitous decline of the business school management science course requires unflinching examination of past practices and assumptions. In light of the sudden failure of the course to satisfy the needs of business schools, we must be willing to question deeply-held beliefs and values. Such an exercise must necessarily be distasteful. It entails criticism of the existing course and the training of management science instructors. The unavoidable result is that the tone and content of this paper are strongly negative.

It is tempting to try to balance the negative with positive suggestions for change. However, all management scientists understand the importance of clearly framing a problem before attempting to solve it. Any discussion of root causes needs to be distinct from discussion of solutions. Therefore, I separate the diagnosis from the cure, by deferring my opinions regarding solutions to a future article.

I start by considering the threat to the business school management science course, and summarize the content and approach of the traditional course. I examine the key external constituencies—MBA program directors and MBA students—and show how the traditional course is inconsistent with their goals. I discuss students' often poor preparation to learn mathematical material, and instructors' often poor preparation to teach in a general management program. I examine institutional forces, including the role of AACSB accreditation, that can hinder performance of business school management science instructors. I show how the weak connection between management science practice and the practice of general management obscures the real application of management science by business students and managers. I diagnose the root cause of the problems to be (in Russell Ackoff's words) professional introversion. That is, the MS profession has generally been unwilling to learn what our business students need on the job and are capable of learning given the backgrounds they have. I end by discussing briefly the challenge of responding to the issues raised.

The Threat to the Business School Management Science Course

The key driver of change in the business school management science course is the fact that management science courses are being reduced or eliminated from the required MBA curriculum.

In 1991 the business school accreditation organization AACSB revised its standards, removing management science from its protected position as part of the MBA common body of knowledge. (The current, highly flexible standards, AACSB (1998) have no required body of knowledge.) This meant that schools could cut

management science without harming their accreditation. And cut they did, with many programs (including Harvard, Stanford, Chicago and Tuck: Powell 1998) reducing or eliminating management science from the required core.

In response to the decline of management science in business schools, INFORMS created a task force that surveyed business school management science instructors and the directors of top-20 MBA programs. Their report (Jordan et al. 1997), widely referred to as the Magnanti Report, showed clearly that the existing business school management science course was failing to serve the needs of the business school programs of the 1990's.

The Magnanti report describes the decline of management science in business schools and provides evidence for the irrelevancy of algorithm- and model-focused courses. The survey of MBA directors indicates that "demand for particular 'hard' OR/MS skills is very low. Where technique is needed, it involves statistics more than OR/MS. There is demand for general skill in model formulation and interpretation and in quantitative reasoning".

The report finds (Jordan et al. 1997 §3.3) that:

"There is little support for the role of the solo OR/MS faculty member providing advanced, specialized education in the framework of an MBA program. . . . There is clear evidence that there must be a major change in the character of the OR/MS course in this environment. There is little patience with courses centered on algorithms. Instead, the demand is for courses that focus on business situations, include prominent non-mathematical issues, use spreadsheets, and involve model formulation and assessment more than model structuring."

Why has management science declined so precipitously? Why have courses of long standing suddenly become threatened with reduction or elimination? The answer is simple: there is a large gap between what is taught in the traditional business school management science course and the requirements of MBA programs and MBA

students. Clauss (1997 p. 35) puts it succinctly: “We found it easy to teach mathematics. A generation later, we’re still finding it difficult to teach management”.

The Traditional Business School Management Science Course

In this section I summarize the content and goals of the traditional business school management science course. This is challenging, because little has been written about what is taught in the course. I base this summary on the contents of several management science survey textbooks, discussions with business school management science instructors at conferences, conversations with business school students and alumni, discussions with textbook publishers (who have sales staffs that provide formal feedback on instructor desires), and the remarks of senior members of the management science profession who have shared their experiences and perceptions.

The traditional business school management science course teaches an appreciation of the management science body of knowledge. This body of knowledge is concerned with the properties of algorithms applied to models. The traditional course is organized around a taxonomy of models and solution techniques. The course teaches a set of structured models (e.g., the transportation model), focusing on algorithms and tools. The goal of the traditional course is for students to become informed consumers of the output of management science professionals (Borsting et al. 1988) rather than to be able to utilize management science themselves.

Although declining in importance, algorithms are still taught by some business school instructors. This is changing, however, as none of the spreadsheet management science survey textbooks include the simplex method. However, the simplex method is presented in several current management science survey textbooks, including Anderson, Sweeney, and Williams (1997), Render and Stair (1997), Hanna (1996), Lawrence and Pasternack (1998) and Taylor (1999). The simplex method is also presented in a popular production and operations management textbook, (Chase,

Aquilano and Jacobs 1998). One textbook publisher estimates that at most 25% of the market demands the simplex method.

The traditional course uses algebraic notation to represent models and the properties of models. This reliance on algebraic notation is unfortunate because spreadsheets are the *lingua franca* of business quantitative analysis and (as I discuss below) business students have inadequate mathematical preparation. There is careful attention paid to sensitivity analysis, which focuses on the computation of ranges over which results (whether deterministic or stochastic) are considered valid. Traditional sensitivity analysis can be of value, but its utility is limited by the absence of meaningful guidance in how to use any resulting insights to communicate, persuade or drive change in the business. Data are assumed to be accurate, complete and available without expenditure of resources, although it is well known that most analyses by managers or OR/MS professionals face significant challenges in the acquisition, management and cleaning of data. O’Keefe (1995) has a stronger opinion: “MS/OR as portrayed in textbooks assumes that any data requirements can be met; in practice this is patently ridiculous.”

Illustrative and practice problems are generally toy problems without genuine managerial content. Real world examples come from *Interfaces*, but (as I discuss below) *Interfaces* articles generally describe projects with unusually favorable conjunctions of generous resources, specialist OR/MS talent, plentiful data, and committed management support. The course relies heavily on a normative model of a “decision maker” who has the power to implement decisions. This is problematic because most organizations have diffuse decision-making processes where interpersonal and political considerations are paramount. Little emphasis is placed on the practical challenges of performing management science in the business world. The “informed consumer” paradigm assumes falsely that business graduates have regular interactions with management science professionals, and is critiqued by Powell (1997). It is enlightening to compare the content of the traditional business

school management science course with the goals of MBA programs and MBA students.

MBA Programs

MBA program goals need to be the starting point for any discussion of course content. Although there are differences among the more than eight hundred business schools in North America, they have much in common, and one can reasonably generalize about MBA programs. (This discussion applies as well to undergraduate programs.)

The annual Business Week survey of business schools (Business Week 1998) and Bickerstaffe (1997) provide a wealth of useful information on MBA programs. MBA programs exist to train general managers. General management is a rich and challenging activity, and it is clear that professional managers are more effective than amateurs. General management requires the ability to understand, integrate and apply concepts from several disciplines including finance, marketing, operations, information systems, accounting, organizational behavior, and strategy.

Although MBA program goals vary from school to school, they seem to have much in common. MBA programs seek to graduate students who believe their time and money were well spent. They seek to train students whom recruiters want to hire. They seek for their students to become successful managers and leaders.

Bruner (1998) articulates a vision for the MBA program that contains five goals. Graduates should be effective leaders as well as administratively competent managers. They should have mastery of a comprehensive core body of knowledge. Graduates should be wise judges who can “assimilate ... synthesize... assess ... formulate & test ... and decide well”. They should be lifelong learners. Graduates should be “whole persons...interesting people who carry themselves with high ambitions and ideals, and are able to converse on topics of interest and importance to business and society”.

These are important goals, and I believe that the business school management science course can and should support these goals. How well does a traditional management science course do this?

Not very well. Programs desire effective leaders and competent managers, but the management science course teaches models. For one to “formulate & test” one must be able to create a useful model for any business situation, but the management science course teaches only a limited type of formulation—essentially structuring of a handful of standard models with limited applicability. Programs seek assimilation and synthesis, but the management science course focuses on algorithms and tools.

Although AACSB once anointed management science as an element in the MBA “common body of knowledge,” instructors must recognize that the management science body of knowledge is no longer considered essential to the MBA. Furthermore, management science is not a functional area of business, nor is it inherently interdisciplinary (Ackoff 1979a). Management science is an intellectual discipline that is too often peripheral to the needs of MBA programs. This makes it easy for the management science course to be reduced or eliminated completely.

MBA Students

The strengths, weaknesses, interests and goals of MBA students are an essential component of any discussion regarding the business school management science course. Porter and McKibbin (1988, p. 110) surveyed MBA students in 1985 at the 620 member schools of the AACSB and report that the top three reasons for obtaining an MBA are “high probability of challenging career opportunities”, “high probability of a good job upon graduation” and “intrinsic interest in business/management”.

Business Week (Business Week 1998) and Bickerstaffe (1997) contain much useful information about what students find relevant and interesting. Students are interested in the practice of management. They seek learning and growth that will make them successful in demanding careers. They make a large investment of time and money (including the opportunity cost of not working for two years) to take an MBA, and want to receive value for their investment.

Borsting et al. (1988) indicate that students are “utilitarian; a major motivation for taking the

degree is their assumption that they will advance more quickly in organizational hierarchies because they have the degree...". Bell (1998) indicates that MBA students "look to their courses to provide them with skills and knowledge that will enable them to make money".

How well does a traditional management science course support student goals? Not very well. Students want to learn practical skills, but the management science course teaches them mathematics. Students seek support for challenging careers, but the management science course teaches them properties of optimality. Students seek skills and knowledge that will enable them to make money, but the management science course teaches them to be "informed consumers" of the work of management science experts.

This misalignment between management scientists and managers is not new. Russell Ackoff, a major figure in the history of our profession, summarized the misalignment between students and management science professionals 20 years ago, when he expressed concern about operations research/management science as a whole having an "obsession with techniques, combined with unawareness of or indifference to the changing demands being made of managers" (Ackoff 1979a). C. Jackson Grayson, a management scientist, business school dean, and government leader wrote critically about the relationship between management science and business practice in the *Harvard Business Review* in 1973. (Incidentally, it is interesting to note that in the 1960's management science appeared regularly in HBR, but no longer does; see Corbett & Van Wassenhove 1993.) Grayson argued that management scientists strip away too much of a real problem: "time constraints, data-availability questions, the people problems, the power structures, and the political pressures—all the important, nasty areas that lie close to the essence of management—are simplified out of existence". These issues are of the essence for business school students. Although they are often rightly assumed away in research projects, they must be addressed in business school teaching. Management science does have the power to enable better management of these

issues, but the traditional course simply doesn't deliver the goods.

MBA Student Mathematical Preparation

Business students are generally not skilled at math. At conferences it is common to hear instructors express concern or complaints about students' poor mathematical preparation. Despite required statistics courses, business students (and practicing managers) have poor intuition about probability and are unable to reason usefully about probabilistic events (Ingolfsson & Zalkin 1999, Savage 1997). Jordan et al. (1997) survey business school management science instructors and report that 77% of instructors view the "math background of students or fear of mathematics" as a principal source of teaching and learning problems. Papageorgiou (1996, p. 232) indicates that "most business students lack the mathematical background and aptitude necessary to 1) understand the technical aspects of OR/MS, 2) appreciate their possibilities, and 3) develop a favorable attitude towards their uses."

Teaching a mathematically-oriented course to students with insufficient mathematics backgrounds has predictable results: frustrated instructors, frustrated students, and poor teaching ratings. These results in turn entail low status for the course and vulnerability to reduction or elimination.

I suspect that this behavior by instructors stems from a deep difference in values between instructors and students. For example, many instructors believe that a mathematical course is important in its own right, or that mathematical analysis (albeit inadequately retained by the bulk of the class) makes the students smarter in some sense. Some instructors reject students' "utilitarian" interests (Borsting et al. 1988) or "making money" (Bell 1998) as valid goals of higher education.

If true, this value conflict poses a serious dilemma for an instructor. His personal values might impel him to teach mathematically oriented material even though he recognizes that student preparation is insufficient. Although I sympathize with this sentiment, it is a trap that compromises teaching and learning. Anonymous (1998) in a

review of Palmer (1998) insightfully describe the perils of this approach:

“[Instructors who agonize about students’ poor preparation] sounded like doctors in a hospital saying, ‘Don’t send us any more sick people--we don’t know what to do with them. Send us healthy patients so we can look like good doctors.’ . . . [this] helped me understand something critical about teaching: *The way we diagnose our students’ condition will determine the kind of remedy we offer.*”

You think your students are braindead? Then you’re likely to drip data bits into their veins, wheeling their comatose forms from one information source to the next..., hoping they will absorb enough intellectual nutrients to maintain their vital signs until they have graduated and paid their tuition in full. The problem, of course, is that when the living and breathing arrive in our classroom, this kind of treatment kills them. But the power of this self-fulfilling prophecy seems to elude us: we rarely consider that our students may die in the classroom because we use methods that assume they are dead.”

Trying to teach mathematical material to the unprepared—no matter how well-intentioned—will serve to destroy interest in mathematics and in the valuable tools of management science. An instructor needs to act based on what students actually know, rather than on what he wishes they knew.

In my experience, the innumerate crave numeracy. These students despise their inability to extract meaning from data and numbers, and are grateful to a teacher who can enable them to use numbers to think critically and communicate effectively. Poor mathematical preparation presents an extraordinary opportunity, and management science instructors should seize it rather than complain about it.

Worst of all, the insistence on teaching a mathematics-oriented course carries with it the seeds of our own destruction. If a management

science instructor insists on acting as though students have mathematical preparation they clearly lack, then a rational response is to remove management science from the MBA program. Business school management science instructors have no choice but to adapt their course to the mathematical preparation of their students. (Some instructors find this is a compelling reason to use spreadsheets, because they allow students to do math without knowing it.) Poor student mathematical preparation is not an acceptable justification for poor teaching outcomes.

Management Science Instructor Preparation

Earning a Ph.D. in management science or a related field is a difficult and highly specialized achievement. It typically requires narrow and deep study of subtle technical details of algorithms and models, often with a technical result being the desired goal. It should not be surprising that new business school teachers want to teach models and algorithms. Indeed, Jordan et al. (1997) recommends that INFORMS and dissertation advisers make it clear to Ph.D. graduates seeking business school positions that they will have to function in a “less mathematical, more team-oriented, more eclectic environment”.

Consider the differences in interests, experience and aptitude between business school management science instructors and MBA students. Management science instructors excel at mathematics, are comfortable with and often enjoy mathematical theory, and have a Ph.D. in a quantitative discipline. Business students are typically not good at math, do not enjoy mathematical theory, and do not have a Ph.D. Many instructors have never applied management science (Edwards and Kidd 1994) whereas students crave practical application. Management science instructors often have little or no experience of the business world (Ackoff 1979b and still true today), while MBA students already have several years of business experience. Instructors strive to become successful academics, while MBA students strive to become successful managers.

These differences between instructor and student mean that material that is inherently interesting,

relevant and exciting to management science instructors can be inherently dull, irrelevant and tedious to business school students. A Ph.D. in management science, by itself, is not sufficient preparation for teaching in a business school, especially if unaccompanied by significant business experience.

Business school professors receive essentially no formal training in education or pedagogy. (Hesse 1974 discusses some of the challenges of business school management science teaching.) Most management science instructors learn to teach during their Ph.D. programs or at their first academic job, sometimes in an apprenticeship but all too often by muddling through as best they can. There is a natural tendency for beginning teachers to teach as they were taught, and to seek inspiration in memories of an instructor who once inspired them to learn. However, this carries with it the risk that business school instructors will teach in a way that is most effective for their *own* learning rather than most effective for their *students'* learning. Therefore, it is important that instructors do not rely exclusively on their own experience as students when teaching MBA's. Instructors must consciously adapt their teaching style to their students.

A new instructor is in a difficult situation! He is well equipped to teach a traditional course, but students are neither equipped to learn from it nor are they interested in investing their time in such an endeavor. Most fresh PhDs do not have the skills or knowledge to deliver a truly effective course. Even with growing resources of modern syllabi, textbooks and teaching materials for him to utilize, it is difficult to shake the model and algorithm focus. In addition, institutional issues have delayed the management science profession's response to the changing needs of business students, and career pressures make it difficult for him to invest time on pedagogy.

Institutional Issues

The business school accreditation agency AACSB included management science in its common body of knowledge until 1991. This meant that accredited business schools were required to teach management science, limiting any debate about

the need for the course or its content. The AACSB requirement for management science provided shelter from the cold winds of change that blew through business schools in the late 1980's, driven by criticisms leveled by Porter and McKibbin (1988), the popular press, and recruiters.

In a book about curriculum change at the Weatherhead School of Management at Case Western Reserve University, Boyatzis et al (1995) identify three forces that cause faculty to focus on teaching rather than learning: "1) the tendency to view faculty as experts—that is, as unique sources of wisdom; 2) The reward system for faculty which stresses research rather than teaching, and values papers about teaching and learning less than papers about the concepts within the discipline; 3) the emphasis on faculty autonomy (if students were viewed as customers or clients, faculty would have to surrender some of their autonomy)". They conclude that "the consequence of these forces is that instructors tend to assume learning rather than promote it. Teaching and learning are then viewed as the same thing."

Instructors who are viewed as sources of wisdom are less likely to ask whether their teaching is relevant to their students. A reward system that attaches a high opportunity cost to time spent on pedagogical development provides disincentives to change. Faculty autonomy allows instructors to discount valuable feedback from program directors and students—if such feedback is even provided. These forces coupled with AACSB protection created an institutional environment that provided minimal impetus for change in the traditional management science course.

Without external pressure to change and protected from elimination by AACSB, business school management science teaching was able to carry on as it always had. But when AACSB protection was lifted, pressures building for decades (consider Ackoff 1979a) were released suddenly and the management science profession was shocked by the decline that followed. Ironically, the protection provided by AACSB may have harmed management science in business schools by delaying recognition of the problems with the traditional course, and engendering a culture where management science instructors had the luxury of choosing the material to teach with little

regard for external constituencies.

The Practice of Management Science Is Different from the Practice of Management

Management science instructors face a particular challenge because management science is not a functional area of business. Courses in the functional areas of business (accounting, finance, information systems, marketing, operations, organizations, and strategy) are central to general management practice and have intrinsic interest to students, recruiters and alumni. These constituencies are vocal when they perceive a problem with a course. Recruiters and alumni provide a firm anchor in the everyday world of business that compels schools to maintain the relevance and importance of the functional area courses.

To the extent that the business school management science course has an external anchor, it is in the field of management science practice. When instructors bring management science applications into the classroom, they look to management science success stories reported in *Interfaces*. Because the examples in *Interfaces* are so valuable, important and compelling, it is not unreasonable for an instructor to conclude that management science is inherently relevant to the practice of general management.

Unfortunately, traditional OR/MS practice as reported in *Interfaces* articles is not particularly relevant to the practice of general management. *Interfaces* articles are aimed at management science professionals, not managers (Rothkopf 1994). They showcase the value of management science practiced by teams of management science experts, not by one or two MBA-holding managers or staff. *Interfaces* articles generally focus on the use of management science tools, but gloss over essential messy complexities that are important to MBA students such as problem identification, modeling, data, politics, people, communication strategy and change management. Any lessons that management science practitioners could teach MBA students about the *practice of management* is obscured in favor of lessons about *management science*.

Management science professionals have the

luxury of cherry-picking the business situations where management science is applicable, business processes are stable, sufficient data exist, resources are available to hire management science experts and software professionals, and time permits a lengthy development and implementation process. Management science professionals have the luxury of ignoring business situations that are unfavorable to the use of our tools. Reality is different for managers who by necessity are generalists, have limited data, face severe time constraints, and rarely have the option of declining a managerial challenge. Much of traditional management science practice is simply irrelevant to the activities of general managers and MBA students.

The management science profession, with its habit of looking inward to our own notion of practice rather than outward to the needs of students and external constituencies, has struggled to respond to the needs of business students.

Diagnosis: Ackoff's Lament, the Introversion of Management Science

Why does the traditional management science course fail to support MBA student goals and MBA program goals? What is the origin of the gap between what students want to learn and what the traditional business school management science course is teaching? The root cause may be a tendency for management science professionals to be inward-looking rather than outward-looking.

Ackoff 1987 traces the devolution of management science from its roots as a "market-oriented profession" that defined itself by the class of *users* it addressed, through a stage of being an "output-oriented profession" that defined itself by the class of *problems* it solved, to becoming an "input-oriented profession" that defines itself by the class of *tools* it employs. He laments that management science has become an introverted profession whose teachers do not address real management problems but instead "focus largely on what they *could* deal with—the mathematical tools and techniques".

Ackoff's lament is consistent with the state of the traditional business school management science course. It helps explain the false comfort taken

from AACSB protection, the mathematical orientation of a course taught to students with poor math skills (and the associated self-indulgent complaining about poor student mathematical preparation), the lack of interest in how students were using—or in reality not using—the course material, the near total absence from the literature of how managers apply management science on those occasions when they do use it, and the continuing slow response of too many traditional instructors to the threats facing their course.

It is symptomatic of professional introversion that the vital context of the MBA program as a whole has been virtually absent from writings about the management science course. For example, Borsting et al. (1988) propose a model business school management science course without mentioning the larger goals of the business program to which the course presumably contributes. Happily, Jordan et al. (1997) and Bell (1997) have broadened the discussion in recent years.

Looking to the Future

I believe that management science can and should be the best course in the business school. Achieving this goal necessitates teaching a very different course from the traditional one. It will require a process of learning and adaptation for established teachers, and changes to institutional structures to enable new management science Ph.D. graduates to teach successfully in the demanding business school environment.

There is an urgent need for research on what makes the management science the best course in the business school. We need to analyze the handful of published success stories to extract common themes, and articulate a set of principles to guide management science instructors in modifying the traditional course. We need to explore the process of learning and professional development necessary for an instructor to transition away from the traditional course, and provide specific suggestions to traditional instructors on how to proceed. Most important, we need research on how non-expert managers and MBA's actually use management science; this is called end-user modeling and is discussed by Gass

(1990), Plane (1994), Powell (1998), and Sonntag and Grossman (1999).

Conclusions

The forces causing the decline of the business school management science course have been building for decades. Because of the protection provided by inclusion in the AACSB common body of knowledge, the management science course did not need to respond to the needs of MBA programs and MBA students. Management science instructors had the luxury of defining the course content with little reference to external constituencies. This resulted in a course that worked well for management science instructors, but was vulnerable when the protection of AACSB was removed in 1991.

The traditional business school management science course teaches an appreciation for an algorithm- and model-based body of knowledge to enable students to be informed consumers. The time for such a course is past. We are now in a period of transition. Instructors have a window of opportunity to create a new course that is consistent with business school programs, enjoyed by students, and revered by colleagues. However, for some instructors, the window has already closed as business schools continue to reduce and eliminate the traditional course.

The future of management science in business schools depends on external factors that have little to do with the opinions of management scientists. The most important decisions regarding the future of the business school management science course will be made by MBA program directors and MBA students, not by management science professors.

We must address the root causes of the decline of the traditional course by ceasing to look inward to the habits and preferences of management science instructors. Our focus as professional educators needs to be outward-looking. In short, we need to study what our students need to know and can learn.

Acknowledgments

The author is grateful to the faculty and attendees

who made the three Teaching Management Science Summer Faculty Workshops so informative, and to INFORMS, DSI and IFORS for sponsoring them. I particularly thank the three hosts, Stephen G. Powell of the Tuck School at Dartmouth (1998), Peter C. Bell of the Ivey School at Western Ontario (1999) and Wayne L. Winston of the Kelley School at Indiana (2000) for hosting the workshops. I am indebted to the many instructors who have approached me at INFORMS conferences over the years to discuss the opportunities, threats, victories and defeats they were experiencing at their schools. I am grateful to textbook editors Beth Golub, Curt Hinrichs, and Tom Tucker for sharing their uniquely informed perspective on the business school management science course. I thank two anonymous referees for their valuable comments. Relentless feedback from the Associate Editor greatly improved the exposition and scope. This research was partially supported by the Natural Sciences and Engineering Research Council of Canada Grant #OGP 0172794. Any errors of omission or commission are the sole responsibility of the author.

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