Designing an Operations Management Course to Simultaneously Meet Instructional & Research Objectives

by

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ABSTRACT

Mid-career health care practitioners (HCPs), unlike typical targets for management education, training and development (METD) programs (i.e., practicing managers), normally lack meaningful managerial background. Still, they possess skills that facilitate simultaneous attainment of pedagogical and research goals in the delivery of METD programs. This paper reports on how an operations management (OM) course enabled this. The course's central philosophy involved enhancing the quality of the training by getting the HCPs to learn each OM concept by examining and articulating its characteristics within the health care facility they worked. The key contribution of this paper is to show that this philosophy serves not only as a pedagogical tool but also as a way to yield information of value to OM research, particularly in health care operations.

INTRODUCTION

It is axiomatic that successful delivery of any management education/training/development (METD) programs requires approaches that seek to maximize the advantages associated with the positive elements of the METD context, and minimize the impacts of its weaknesses. In an METD program where the accepted weakness is that the trainees have no meaningful prior exposure to either the practice or principles of management, it is natural to devise ways of preventing that weakness from thwarting the program's aims. One would expect this to apply if the trainees are mid-career health care practitioners/providers (HCPs) such as physicians and nurses. Still, as trainees in METD programs, HCPs bring a significant positive trait: training in research, which although acquired in the field of medicine, is transferable to the field of management. The thesis of the present paper is that, even in the face of the aforementioned weakness, this trait can enable an METD program to simultaneously meet its pedagogical objectives and generate research findings that are relevant to the operations management discipline.

The basis for this thesis is an METD program used to deliver training in operations management to a group of HCPs in Jamaica in 1999. In terms pedagogy, the main contribution of the present paper can be viewed as a novel and rich elucidation of how appropriate research activity by the target individuals for any METD program can enhance the program's efficacy. With respect to the research role of the METD, the contribution is a case-based depiction of the nature of a particular operations management problem (scheduling) in some of Jamaica's health care facilities. The key details are reported in the next four sections of the paper: (i) a review of the relevant literature in order to position this paper's contributions, (ii) description of the METD program's essential features, (iii) presentation and discussion of the main findings and their implications, (iv) an outline of the limitations and, hence, some possible extensions of the study.

LITERATURE REVIEW

Since the central aim of the paper concerns the value of the subject METD program as both a pedagogical and research tool, the emphasis of this review is the literature concerning METD. With respect to that literature, related key words searches spanning publications in the last five years showed that, among the seven main OM journals identified by Pannirselvan, *et al*. (1999), there was not a single article providing substantive treatment of those programs. However, there were other outlets with articles that, to some extent, provided relevant backdrops to the present work; e.g., Watad and Ospina (1999), Reynolds (1999), and Clarke (1999). Interestingly, a few of the articles were specific to health care operations (e.g., Cunningham, 1999).

A general conclusion from the reviewed articles is that, for the most part, they touted the potential benefits of METD programs as a stimulant of organizational improvement. Still, there is the dissenting view that, notwithstanding these *potential* benefits, many METD programs are impotent in *actually* effecting beneficial organizational change (e.g., Clarke, 1999). Although the present paper does not aim to address post-training operations change processes, the dissenting view is worth revisiting in discussing possible extensions of the research. Of more immediate importance is that the reviewed papers provided little detail concerning the design and execution of specific METD programs. The resulting gap in the literature, and one that this paper aims to address, is that the absence of such detail and structured analysis made it difficult to elicit any meaningful insight.

The article by Cunningham (1999) is somewhat of an exception in that it provided some information on a program aimed at building the managerial skills of physicians, and is thus taken as a point of departure for positioning the present work. Of particular note in the article by Cunningham is how the training/socialization of HCPs gives them a different mindset from the managers who are often the targets of the sort of METD programs discussed in the literature. Among these differences are that HCPs have limited managerial backgrounds, and are usually less comfortable with the uncertainty associated with making decisions on the basis of imprecise/incomplete data –often a fact of life for the professional manager.

This research argues that, while such differences present non-trivial challenges for designing METD programs for clinicians, there is one difference that represents a positive in that it can be used to accelerate the pace of learning. In particular, as noted earlier, HCPs, relative to the typical manager, generally have stronger research backgrounds. This sort of background

facilitates a situation in which the trainee's learning about a management issue is more likely to involve independent and rigorous probing into that issue. When the target of such probing is an actual organization, the learning is likely to be deeper and the resulting knowledge is more likely to constitute valid empirical research findings. This is the crux of the METD program reported herein. Given this, as well as the previously noted gap in the literature, the intended position of the present work with respect to the MTED literature can be summarized as description and analysis of an innovative and multi-objective MTED methodology targeted at HCPs.

The other aspect of the paper's contribution, empirical depiction of scheduling in health care, will be based on a much briefer review since the relevant background body of literature on the OM problem of resource/activity scheduling is fairly well established and known within the OM field. The review is thus limited to the following summary observations. First is that the literature is dominated by papers in which the emphasized solution to the scheduling problems in health care consists of the management science models and the information/decision support systems (IS/DSS) for effecting the operation of those models. Second, in spite of this dominance, the literature recognizes that because any given scheduling problem is invariably multidimensional (impacting multiple facets of the health care facility) and contextual, pure modeling and IS/DSS approaches will be inadequate. Instead, these approaches have to be part of a socio-technical solution to the problem. Based on the nature of the scheduling problems uncovered in the health care facilities that employed the trainees, this paper's contribution to the empirical base of health care scheduling is to affirm this view. A by-product of this affirmation is reinforcement of the METD program's value as a research tool.

THE MANAGEMENT EDUCATION TRAINING PROGRAM

The institutional framework within which the METD program was run was a project sponsored by the Pan American Health Organization (PAHO) and aimed towards effecting beneficial change in the management of Jamaica's health care facilities. This was to be accomplished through the delivery of a series of 8-week (30-hour) modules to HCPs from several of Jamaica's public general hospitals and specialty clinics. In the summer of 1999, the lead author taught the module of interest in this paper: *Operations Management* (*OM*) *for Health Care Professionals*.

The basic philosophy of the module consisted of two components. The first focused on realizing the module's pedagogical objective by attempting to answer the following question: *How can the training be enhanced by making the OM concepts more directly and immediately relevant to the organizations within which the participants work*? The second element dealt with pedagogy too but also incorporated the research objective. That element is that the pre-existing research skills of the trainees can be directed to not only sharpen their grasp of the OM concepts in the context of their organizations *but also to aid scholarly case-study research in those organizations*.

Table 1 summarizes how the METD program attempted to accomplish these multiple objectives by listing the topics covered in the module and the main course delivery activities. The trainees were required to form teams of 4-6 members, and within each of the six teams that were formed, the members worked at either the same health care facility or multiple facilities that were geographically close to each other. With that in place, the approximately 4-hour class for each of the eight topics started with a lecture covering the topic's basic concepts, models/techniques, and

managerial issues. The next major classroom activity required selected teams of trainees to lead a discussion about how they would address the assigned questions for that topic in their health care facility. The design of these questions was keyed to the previously stated pedagogical and research objectives. That is, each trainee would learn about the topic by reflecting on and articulating its characteristics within the health care facility he/she worked. At the same time this would give the course instructor (in his researcher capacity) a view of the organizations' OM issues as seen by the trainees (as future agents of managerial change in the operations of those organizations). The questions for each topic sought both descriptive answers and analytical answers (e.g., the trainee's perspectives on the quality of OM practices in their organizations).

The preliminary trainee-led discussions enabled the instructor to conduct a preliminary test of the trainees' grasp of the topic and/or questions, as well as to provide any needed clarification. Following this, the trainees used the one-week period between classes to collect the information and prepare their written reports and formal oral presentations. Based on these, the trainees were given further written and face-to-face feedback, which they were required to incorporate into their final (end-of-course) report covering all topics. Each trainee's performance in the course was based on the quality of the discussions, reports, and the formal oral presentations.

In addition to being the bases for assessing the METD program's pedagogical efficacy, these reports, presentations, and the instructor's notes that were derived from them also comprised the primary case-study information on the five health care facilities that were studied. Remaining information came via observations from partially guided and ad-hoc (based on convenience) facility visits. Of note is that although six team reports were turned in by the students, the reason for reporting on only five case studies is that one of the reports was considered unusable. That is so because that report did not have a sufficient number of topics covering a single health care facility among the several facilities studied by that team.

FINDINGS & ANALYSIS

Findings on the METD program's pedagogical effectiveness was based on evaluating the degree of the trainees' cognition using three components. First, the trainee's answers to the assigned questions had to convey good grasp of the each topic's basics. Second, their descriptive answers had to be thorough enough so as not to leave the reader in an unduly uncomfortable guessing situation about what happens at the health care facilities. Third, their answers concerning their perceptions/analysis of each OM issue should depict the multi-dimensional nature of that issue. The general conclusion is that these criteria were satisfactorily met. Table 2, which summarizes the trainees' answers concerning resource/activity scheduling in their health care facilities, epitomizes this conclusion.

To understand the rationale for this conclusion, first note that the trainees' use of cause/effect analysis to identify potential sources of improved scheduling was complemented by the use of the 5 *Ps* framework in Chase, Aquilano, and Jacobs (1998) to categorize the sources. Also, from the findings on which Table 2 is based, attainment of cognition for the multidimensionality component also evinced attainment for the thoroughness component, which in turn evinced the trainees' grasp of the OM fundamentals. Now, as Table 2 shows, the trainee's suggested potential solution sources depict cognition of the multidimensional nature of scheduling. That is,

invariably, each suggested source is shown to be related to most areas in the 5 *Ps* framework. The conspicuous presence of the "OTHER" category resulted from the difficulty of irrefutably categorizing the original research data under any of the 5 *Ps* in the Chase *et al*. framework. The most significant illustration of this was the recurring theme that effective solutions to the cited problem would require that more decision making authority and resources be moved from outside to within these facilities; e.g. from the health and finance ministries.

The discussion in the immediately preceding paragraph mirrors the findings concerning the other OM decision areas covered in the module. This result is quite predictable since the module's grading scheme (of which the trainees were fully aware) required them to demonstrate cognition with respect to the three stated components. It should be noted that Table 2 does not represent an exhaustive list of the suggested sources (or the problem causes). Instead, only the more critical ones (either cited by at least two of the five health care facilities or treated as consequential in the report on at least one facility) are presented. Also to fully convey all the important details of the descriptions in the original research data would mean presenting (almost) *ad verbatim* descriptions. So, in the interest of parsimony, the table shows summary statements that portray the essential content of the original descriptions (of problems/causes/solutions) and further characterizes the breadth of these descriptions via the 5 *Ps* framework.

The trainees' commendable level of cognition, especially with respect to the multifaceted nature of OM issues, seemed due in no small part to their pre-existing research orientation. In other words, without that research mind-set, the trainees might not have been able to so impressively detail both their descriptive answers and their more analytical answers depicting the multiple facets of the various OM issues. To summarize all of this, it appears that the work by the trainees has positively affirmed the METD program's capability of achieving its pedagogical goal. One way in which this is encouraging is that it shows the METD program as enabling individuals to, while learning a subject, systematically study an organization with a view towards defining its OM problems and potential solutions as part of the process towards resolving those problems.

A similarly positive conclusion applies to the question of whether the METD program's research objective was met. In essence, this conclusion results from the similarity between evidence of the program's pedagogical effectiveness and of its research effectiveness. For example, with the trainees' use of cause/effect analysis to elucidate each issue, they have effectively contributed to the research task of providing ample empirical illustrations of the multi-dimensionality of that issue. Attainment of the research objective is further evidenced by the fact that the data on the five health care facilities not only generated some interesting and testable hypotheses but were rich enough to hint at the likely outcomes of tests of those hypotheses. Space limitations preclude presentation of all these hypotheses here but one of them is worth citing as an illustration. This hypothesis is that the perceptions of the trainees (HCPs) on the nature of the problems, potential solutions, etc., differ from those of administrative personnel. The trainees' frequent reference to what seemed to be an age-old clash of views between HCPs and administrators suggests that formal tests would support that hypothesis. In terms of change management process and issues of power in organizations, this hypothesis is particularly interesting. That is, in the absence of much power, HCPs cannot expect their ideas to have a clear path to implementation, unless those solutions are in sync with the views of administrators.

LIMITATIONS/EXTENSIONS

One of the noteworthy features of this study is its inclusion of *action research*. That is that the subject METD methodology was engineered to produce the results that are reported here. Thus, a possible criticism is that the findings concerning the pedagogical value of the methodology are not independent of the methodology but the inevitable result of it. Specifically, since students will, in their own self-interest, invariably try to satisfy the course's stated success requirements, and since the outcomes of their efforts comprise the research results, then there is little reason for divergence between the results and the course design (methodology). Though valid from a research purist's point of view, this criticism is peripheral to the more central research contribution of illustrating how the methodology can be made to work.

In spite of this rebuttal, the above concern suggests that one way in which the research could be extended is to apply the concept of *triangulation* (discussed in, for example, Jick, 1979) by using a formal course evaluation instrument as part of the METD methodology. Thus, in addition to evidence from the trainees' work in the course and from their positive unsolicited feedback on the course, evidence from such an instrument might enable fuller assessment of the methodology. The research can also be extended in at least two other ways. First, because the perceptual (as distinct from objective) research data are based on the views of HCPs and exclude the views of non-HCP personnel, there may be some bias. This means that if the research is to be replicated then one option to help assure a more balanced picture of the OM issues is to deliver the program to a mixed group (clinicians, physicians, administrators, etc.). A second possible extension is a follow study up to determine the implementation status of the trainees' suggested solutions. As reported in the literature review, Clarke (1999) cited a lack of post-training implementation so such a research extension would enable investigation of that generalization. The inadequacy of the wherewithal to effect change, being a general concern in the trainees' reports, might, in such a follow up study, prove to be one possible explanation for the generalization.

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Table 1
Design of Course Module: Operations Management for Health Care Personnel

COURSE TOPICS (in the sequence covered over the 8 weeks)	**KEY COURSE DELIVERY ACTIVITIES**
1. Fundamentals of OM in HealthCare Sector 2. Quality Assurance 3. Forecasting and Facility Location 4. Process Design, Capacity and Layout 5. Waiting Line Models 6. Job Design & Work Measurement 7. Inventory/Supplies Management 8. Short-Term Scheduling	**A: Lecture given on the topic** **B: Preliminary test of cognition based** **C: Trainees collect and analyze data on their health care organizations** **D: Trainees give written reports and oral presentations of their findings** **E: Instructor feedback to trainees** **F: Reports revised for final submission**

Table 2
The Nature of Short Term Operations Scheduling Problems in Some of Jamaica's Health Care Facilities

Part (a): Problem Severity

Cited Problems	Number of facilities that cited it
1. Staff shortage (clinical and support staff)	5
2. Staff punctuality (lateness, absenteeism)	5
3. Shortage of inventory/supplies	5
4. Inadequacies of patient processing rooms	4
5. Punctuality of patients (lateness, no-shows)	3
6. Equipment malfunction	3
7. Staff aversion to reassignment ("floating"[a])	2
8. Missing/misplaced patient records	1
9. Patients' non-compliance with health care instructions	1

Part (b): Potential Sources of Improvements

Sample of Cited Solution Sources	Frequency of Mention	OM Category: People	Plants	Parts	Processes	Planning & Control Systems	OTHER
1. Strengthen internal inventory control functions	5	✔		✔		✔	
2. More systematic scheduling via routine collection of relevant data (demand, processing times, etc.)	5	✔		✔		✔	
3. Better work conditions and incentives for nurses to raise commitment to the profession	4	✔			✔	✔	✔
4. Formalize/streamline the maintenance function for equipment (especially) and buildings	3	✔	✔		✔	✔	✔
5. Emphasize breadth of skills in nurse training to assist with more effective floating, etc	3	✔					✔
6. Establish a formal unit with responsibility for improving the physical, informational, and transactional efficiency of procurement processes	3	✔		✔			✔
7. Broaden the base of transportation options to assist staff in their normal commute and in their delivery of community ("off-site") services	3				✔		✔

Notes: The 5 *Ps* framework by Chase *et al*. (1998) uses these definitions: *People* (direct labour force); *Plant* (facilities where transformation processes occur); *Parts* (inventories used in transformation processes); *Processes* (equipment/steps in the transformation processes); *Planning*/*Control Systems* (procedures and information used to operate/regulate transformation processes).

Notes: [a]"floating" refers to the approach of reassigning nurses hospital-wide according to demand fluctuations.