Waving or drowning? Re-evaluating the place of systems thinking in business and management learning and curricula

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Abstract

While much foundational work in business and management rests on the broad tenets of systems thinking the position and assumptions of systems theories have been subject to question and critique, and its place in today curricula is therefore not so assured.   Even so it has been claimed (Atwater at al, 2008) that many academics in business schools still regard systems ideas of being of import although it is unclear just how widely they are actually taught. This paper therefore re-appraises the role of systems thinking in the curriculum and examines the implications of introducing it into management education.

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INTRODUCTION

Waves can connect or divide, bring to the surface or engulf.   There have been a number of tidal waves in business and management over the past decades which, for a while, have shaped thinking and knowledge about organizational processes, touching many in academia and management practice before they ebbed and flowed, giving way to newer ideas and seemingly more compelling perspectives.   Systems thinking is one such wave, sweeping much before it at the inception of scholarly work in business and management but perhaps no longer considered to be at the crest of knowledge and learning in business school curricula.

However this view may be misplaced. A study by Atwater , Kannan & Stephens (2008) surveyed faculty in the top 63 graduate schools of management in the US to explore the awareness and perception of systemic (systems) thinking. The authors restricted themselves to fairly traditional views of this knowledge domain neglecting more recent developments. Even so, and perhaps surprisingly, the findings were that the majority of respondents thought that systems thinking was an essential part of graduate management education. Having said this although it appeared that it had permeated almost every functional area of business, it was unclear just how widely it was actually taught.

This paper therefore re-examines systems theory in the light of recent critiques about management learning and education. It then explores the challenges of introducing it into the curriculum, reviewing an attempt to do this in an MBA programme by way of illustration.

SYSTEMS THINKING AND BUSINESS EDUCATION

There is an implicit assumption that systems thinking is wedded to a functionalist paradigm, epitomising an essentially technocratic view of business problems. As such its legitimacy within contemporary business and management programmes is called into question, particularly in light of the now flourishing debate about the perceived problems of management education. These disquisitions have been extensively rehearsed elsewhere (see for example, French and Grey, 1996; Ghoshal, 2005; Grey and Mitev, 1995; Mintzberg, 2004; Pfeffer and Fong, 2002; Schneider & Kessler, 2004; Slater & Dixon-Fowler, 2010; Willmott, 1994), though it should be noted that the historical roots of this discourse are multifarious and its contributors diverse.   The essence of much of the dissatisfaction centres on three issues which, we argue, more recent developments in systems thinking can go some way to address. These are the fragmentary and compartmentalized nature of the business curriculum and its basis in functionalist thinking; the a-contextual nature of much business and management education which, it is argued, is situated within an essentially parochial, Western-based *Weltanschauung*, and the relationship between theory and practice in business and management programmes. We review each of these in turn to identify the issues and explore how systems thinking might relate to them.

A Fragmented, Functionalist Curriculum

There is disquiet over the apparent silo-nature of much business education, in which aspects of business and management (such as accounting and finance, operations management, marketing and so on) are taught and discussed as if they operated as discrete activities. Many have argued that we need a more holistic view of management (Starkey and Tempest, 2009) because too often the nature of the curriculum masks the essential interconnectedness of the subject matter (Pfeffer & Fong, 2002), overemphasising the analysis of individual parts of firms at the expense of an appreciation of the integrative nature of organizations as a whole

(Zald, 2002). There is consequently a danger that such perspectives encourage partial analyses of complex problems, (Ghoshal, 2005), leading to simplistic solution-seeking.

In stressing the complex and interrelated nature of business, systems thinking can be seen as a way to bring together these different elements of the curriculum. However this alone does not go far enough. It also needs to be acknowledged that such business problems are open to multiple interpretations about their causes, consequences and possible solutions. Management education needs to offer more than a functionalist analysis of management functions. Some systems approaches can assist here since they have moved away from unitary interpretations to recognise more complex and pluralistic views of the world. Strategic Assumption Surfacing and Testing (SAST) (Mason and Mitroff, 1981) is one example of this. In this approach the functionalism of hard systems thinking is relinquished for a more interpretivist orientation and the ill-structured nature of problem situation is explicitly recognised. SAST is concerned with 'wicked problems' (characterised by interconnectivity, conflict, and uncertainty) and views their solution from different perspectives to gain a higher level of understanding through participatory debate.

This takes us so far, but the fact remains that different stakeholders may have the power to impose their own views so any debate may be partial, provisional or personally motivated – participation in such cases being highly circumscribed or largely symbolic. Critical management perspectives (Grey, 2004) have long been suspicious of overly managerialist agendas that privilege the objectives of one group over others and concerns have been expressed about the tendency to ignore wider political and ethical questions in business schools (Ghoshal, 2005; Perriton, 2007).

The development of Critical Systems Heuristics (CSH) (Ulrich, 1983), following the work of Churchman (1968, 1971) has therefore been of significant import as this is centrally concerned with identifying and working to counter organizational and societal inequities. CSH explicitly recognizes that inequities may be perpetuated by excluding certain stakeholders from decision making processes. The methodology serves to reveal and challenge the underlying value assumptions, particularly about who is and who ought to be involved, that are endemic to planning and decision making but which so often are unquestioned. Hence in problematizing the notion of participation this approach offers a more critical and potentially emancipatory perspective.

Developing this further, the underpinning philosophy for critical approaches in systems thinking has been encapsulated in three commitments (Jackson, 2000):
- *critical awareness* relates to the critique of the different systems methodologies and social awareness of the societal and organizational context
- *improvement* relates to the achievement of 'something beneficial' reflecting a circumspect aspiration in the light of the postmodernist challenge to the notion of universal liberation
- *pluralism* recognizes the need to work with multiple paradigms without recourse to some artificial 'unifying' metatheory; the ability to use methods disconnected from the paradigm of their genesis but in an awareness of the paradigm that they are being used to serve, and the existence of other ways of being pluralistic, for example Mingers and Brocklesby's multimethodology (1997).

Hence newer approaches to systems thinking require a 'critical turn' in how validity claims are formulated and justified. According to Ulrich (2001: 23), "We must henceforth qualify

such claims very carefully, by explaining to what extent and how exactly they depend on assumptions or may have implications that we cannot fully justify as researchers, but can only submit to all those concerned for critical consideration, discussion and, ultimately, choice". Any meaningful introduction of systems thinking into business and management programmes requires that such advice is given serious consideration.

An A-Contextual View of Management
The second strand of criticism levied against business and management education is that it emanates from a largely Western perspective. A large tranche of the curriculum central to business and management programmes rests on the concepts and ideas put forward by scholars mainly from the US. As Engwall (2007) notes, the top tier journals are all published in the US and are dominated by US scholars. Similarly, research into textbooks used in business schools also indicates a US predominance. For example, a study of the origin of textbooks in 8 Nordic business schools found that 40% had a US origin and even non-US authors drew heavily on US sources (Engwall, 2000). If systems thinking is to be of real relevance outside of the classroom it must locate itself with the rich, culturally diverse context of the globalised world.

As with other areas of business and management the dominant narrative in systems thinking also originated with Western scholars, but newer work has recognised the importance of context. For example, a rich seam of thinking has explored the links between Western systems perspectives and Eastern philosophies (see, for example Brugha, 2001). The work of Gu and Zhu (2000) is particularly interesting because it does not merely seek to identify points of difference and similarity between the two but advances research in this field by proposing a systems methodology that is based on Chinese cultures and systems practice in the Oriental context since the 1950s. The WSR approach is comprised of three 'differentiable yet inseparable' aspects:
- Wuli (regularities or laws that govern the relational processes of the objective world)
- Shili (manners and styles we choose to follow in order to investigate natural and social phenomena)
- Renli (human relations)

Thus Gu and Zhu provide methods and process to assist research and practice through an investigation of these three concepts which, in sympathy with elements of Eastern traditions, emphasise the bringing together of diverse aspects in a creative tension.

This view finds some resonance in postmodernist orientations which also eschew the universalistic prescriptions of earlier systems thinking in favour of more causally ambiguous and indeterminate positions. So, for example, Taket and White's (2000) Participatory Appraisal of Needs and the Development of Action (PANDA) sets out the main features of intervention in the spirit of postmodernism. Rather than offer a rigidly structured methodology, Taket and White suggest the need to recognise and respond to pluralism in four areas: in the nature of the client, in the use of specific methods, in the modes of representation employed, and in the facilitation process. They offer this framework in the explicit recognition that knowledge about these areas is partial, provisional and contingent and 'improvement' can only be defined according to the local context.

Theory, Practice, and Pedagogical Issues
The third concern has been the link between theory and practice, epitomised by debates about the utility of business and management knowledge to practitioners (Perriton, 2007; Pfeffer

and Sutton, 2006; Slater & Dixon-Fowler, 2010) and the concomitant challenge to teach material that is both rigorous and relevant (Gulati, 2007). The charge is that the link between theory and practice is problematic and, in consequence, academic programmes in business inadequately prepare graduates for the "real world", (Atwater, Kannan & Stephens, 2008:9; Mintzberg, 2004).

Some strands of work in contemporary systems thinking relate directly to such critiques. For example the founding assumptions of Critical Systems Practice (CSP) (Jackson, 2003) is that the real world is characterised by complexity, heterogeneity, ambiguity and paradox and that no one theoretical paradigm alone is sufficient to offer the rich insights necessary to operate effectively in these contexts. Instead, in line with one of the *commitments* outlined above (Jackson, 2000), a multi-paradigmatic approach is advocated to cope with the inherent volatility of complex modern organizations. CSP therefore utilizes a variety of developed and emerging systems approaches and methodologies that are based on opposing paradigms. The apparent incompatibility of their underlying philosophical assumptions means that they cannot be integrated without something being lost so the approach seeks to manage paradigm diversity by encouraging them to confront one another on the basis of 'reflective conversation' (Gregory, 1996; Jackson, 2003). No paradigm or methodology is allowed to escape unquestioned because it is continually confronted by the alternative rationales offered by others. The preferred way of working (Jackson, 1999) is to observe a continuous commitment to methodological pluralism by working with 'dominant' and 'dependent' methodologies in creative combination. Pollack (2009) calls this a 'parallel' approach to multi-methodology as opposed to a 'serial' approach.   Working with seemingly incommensurable paradigms in this way goes some way towards mirroring the challenges of paradox and contradiction inherent in the messy and multi-faceted problems of the real world and using a range of theoretical perspectives to reflect on practice.

All this takes us some way from the assumptions of relative simplicity inherent in early systems thinking. While this new understanding may be required in order to engage with contemporary business conditions, managing methodological pluralism in practice is no easy task and switching between paradigms and methodologies places significant demands on managers (Brocklesby, 1997), as we discuss below.

Debates about *what* to teach ultimately raise questions about *how* to teach business and management. There is a fundamental uncertainty here about how far the knowledge and skills deemed to be associated with these topics can be taught, and how far they can only be gleaned through experience. Thus perceptions about the nature of management education are intimately related to questions of pedagogy. If systems thinking is sincere in its attempts to bring about a more multifaceted, holistic appreciation then how this is facilitated must also be considered. The challenges in making such ideas accessible to students and managers are now discussed, as we candidly review the success, failures and learning points for those engaged in such endeavours.

UTILIZING SYSTEMS THINKING IN CURRICULUM DESIGN AND TEACHING
The above has reviewed how developments in systems thinking might relate to some concerns about business and management education. But how might each of the areas identified above be addressed and what are the challenges in practice?   We now examine one attempt to bring systems thinking into an MBA programme, not only as a component of the curriculum but also into the design of the programme itself.   The purpose here is not to offer an exemplar of MBA design but to highlight some of the key issues involved for both

faculty and students. The MBA discussed here is a UK-based, full time, 12 month programme which takes in around 35 international students each year who come from a wide range of regions including Asia, the Gulf, Africa and Europe. It should be noted that participants have considerable work experience and hold senior positions in a wide variety of manufacturing and service organizations.

A Fragmented Curriculum
Thematic organization
The use of systems thinking at the early stages of the re-design highlighted that, in many ways, an MBA programme can be thought of in critical systems terms. An MBA is multi-dimensional in nature and should be viewed holistically (as a programme) rather than simply being seen as the sum of its parts (a collection of modules or courses). A critical systems perspective acknowledges that one module will be limited in terms of what it enables us to see, but a programme that is informed by systems thinking should facilitate, through its design, the students' ability to learn by reflecting on the links between the parts (modules) in order to better understand multi-dimensional issues and multiple interpretations of business and management problems. The emphasis here is not on functional 'tool kits' to solve managerial problems but about recognising the variety and contested nature of much of our reading of organizational phenomena. This conceptualization of the MBA focussed attention on how we could create a learning 'space' in which both students and staff could be encouraged to focus on the links between modules.

A long period of discussion and reflection led to the emergence of five themes: Managing in a Global Context, Managing Relationships, Managing the Value Chain, Managing Knowledge and Managing Strategically which together was felt could capture the core elements of the MBA. The content within themes was designed to be intentionally overlapping, in keeping with the aim of developing an interconnected curriculum. Specialist and advanced options were also incorporated into these themes, while a final dissertation provided another way of integrating elements of the programme. An overarching module incorporating a critical systems perspective and entitled Managing Holistically was developed to connect the different themes and provide a vehicle for a critical reflection of the curriculum as a whole. This is now examined in detail.

Connecting the Themes: Managing Holistically
The redesign of the programme incorporated a fundamental rethink of how systems thinking could be taught in terms of delivery, content and assessment.

Delivery and Content   To employ systems thinking in the design of the MBA required that we see modules as wholes in themselves but with strong links to other modules within the relevant theme, that themes could be regarded as wholes but again with strong links to other themes and the programme. To use systems language, we were seeking to give maximum autonomy to the parts while retaining the cohesiveness of the whole. As we did not want systems to be relegated to the silo of a module or theme again, we recognised that the design of the programme had to emphasise the links between the modules and themes and this would affect the plan for the delivery of Managing Holistically. Hence Managing Holistically 'tops and tails' the core modules of the MBA programme. In the early stages of the programme, systems theory is introduced and a range of different paradigms and associated methodologies are discussed and students are encouraged to think about how to make sense of these in terms of a critical systems approach. At the end of the first part of this

component students are left with a challenge; when studying other areas on the MBA, to think about whether the field is dominated by a particular paradigm, whether any paradigm shifts have taken place in the area and what systems methodologies might be drawn on to better understand practice. Hence the module not only serves to help students reflect on systems thinking, it also challenges them to apply this thinking when studying the rest of the MBA.

The final part of the Managing Holistically module, delivered at the end of the core taught programme, provides students with an opportunity to critically reflect on the MBA as a whole and how an understanding of systems thinking might relate to practice. For example, we look at how various systems methodologies might augment the strategic management process. Students are introduced to a model of the strategic development process (Dyson et al., 2007) that embodies key systems concepts: coping with variety, managing complexity, respecting intuition and understanding specificity. Using this model as a basis, students are able to complement this with other systems methodologies for promoting critical reflection and learning that they have been introduced to through the Managing Holistically component and, in so doing, reconceptualise the strategic development process.

Overall, the intention was to enable students to:
- Apply a range of systems methodologies and models to enhance critical reflection and learning
- Evaluate how the different systems methodologies and models can lead to an enhanced understanding of how to manage strategy, relationships, knowledge, and the value chain
- Have a critical awareness of the roles of management and the status of managerial knowledge in organizations and society.

Assessment The key emphasis of the assessment is to ensure that it has both practical relevance and is holistic in nature. The assessment requires students to analyse their own problem situations or 'messes' (Ackoff, 1981) and consider how these might be addressed using a systems approach. One student grasped well the multi-faceted nature of the assessment in describing the situation that she faced when stepping up to the role of manager of a bank branch in Lekki, Nigeria. She was able to demonstrate the utility of several system approaches in addressing the different aspects (for example, structural, political and emotional) of the situation. Recognition that the success of any real-world intervention is only partial but provides the basis for further learning is key here.

This approach to assessment is designed to reflect Grey, Knights and Willmott's (1996:100) argument that a critical approach should start with the students' own lived experiences. There is of course a danger that privileging such concerns might lead to pure pragmatism; 'this works in my context so how can its value be questioned?'. Hence the emphasis in designing the assessment for this module is on students critically reflecting how well the use of certain systems methodologies would work in their own context, what might facilitate or impede this and making links between different concepts. Given the multicultural nature of the student body, much is learnt at this stage about the use of different systems methodologies in different contexts. An example arose in Bahrain, where a passionate classroom debate arose about the usefulness of rich pictures (a technique used in Soft Systems Methodology (SSM), Checkland, 1981). Orthodox Muslims may believe that there should be no portrayal of a person's image so this prompted a lively debate. Such issues are rarely considered in the theoretical literature on SSM.

A-Contextual Views of Management

As noted, business and management education has been accused of ignoring contextual issues, for example by not explicitly acknowledging cultural differences and thus implicitly assuming Western value systems, norms and beliefs. These charges can be levied at systems thinking alongside other mainstream subjects on the MBA, notwithstanding attempts by researchers such as Gu and Zhu (2000) outlined above.

Undoubtedly we were helped by the fact that the School in question has long experience of teaching the MBA in a non-Western context, having delivered the programme on a part-time basis in Hong Kong, Singapore, Oman and Bahrain for more than 15 years. Even so, the notion that our students needed to challenge accepted practices was easier to convey than the idea that they also needed to develop an awareness of what might be more amenable to challenge in a given situation and where points of leverage for change might lie. Indeed, we had to remain acutely aware that some cultural norms might be antipathetic to overtly critical approaches. As Mingers (2000: 227) has articulated: "being overly critical in a real situation could be dangerous" and we felt this to be particularly true given the diverse nature of the student body in terms of culture, as well as gender and religion. Having said this, when used with sensitivity, systems thinking can illuminate cultural differences. In Singapore, the teaching of Critical System Heuristics provided the stimulus for a discussion about the role of management in society, social constraints and social change.

Theory, Practice and Pedagogical Issues

As noted above, there are debates about the relationship between theory and practice in business and management programmes. While Atwater et al. (2008) find evidence of some systems thinking in graduate management education it is not yet mainstream in MBA curricula in the way that, say, accounting and marketing are, and the inherent challenge of discussing a topic that embraces apparent contradiction and theoretical pluralism means that systems thinking must present a convincing argument about its relationship with business and management practice.

In designing the MBA we had advice and feedback from practitioners through the external advisory committees of the School and the MBA. This ensured that we had the view of practising managers, however we were mindful of the possibility of tension between being seen to be 'relevant' and maintaining a critical stance. This is a central dilemma for critical approaches in business and management where students may need to be persuaded of the legitimacy of such critiques and require demonstrations of 'real world' application.

In the MBA discussed here, this situation was resolved to a some degree by the contribution of a practising manager familiar with the concepts and ideas who could demonstrate their utility in helping to address complex business problems. This individual was the head of corporate review for a major police force in the UK and also a doctoral candidate at the School. Being familiar with systems thinking, he was able to provide examples of how this is utilized in the police force and also reflect on how it relates to many of the approaches covered in teaching, thus uniting the concepts taught in the module with real world practice. Overall the use of external practising managers as invited speakers was crucial in establishing the credibility of the systems approach with students, particularly those who had not come across systems ideas previously. Pedagogies which require students to examine systems thinking in their own organizational settings, as in the assessment described above, are

additionally useful in putting ideas into practice and so offering the chance for a more direct critical examination of their utility.

We have touched on how systems approaches may begin to address some of the concerns about business education. However introducing such changes is not straightforward and we now turn to examine the challenges that may arise.

CHALLENGES FOR FACULTY AND STUDENTS
Faculty
The Need for Critical Self Reflection
The process of curriculum design and development is often demanding. This particular re-design required staff to operate in a more open and critically reflective way to draw out the connections at the level of content to enable the alignment of modules around the emerging themes. The process of re-design required us to explicitly question the cohesiveness of the modules and themes. It also promoted a discussion about the assumptions that underpin different domains of knowledge; what we teach and why. This highlighted the fact that whilst perspectives in some themes were seen as sharing similar ways of seeing the world, others appeared to differ in their stance towards organizations and managerial prerogatives. Such contradictory positions are not necessarily problematic since this more accurately reflects real world states than the imposition of a stance that seeks to encompass all managerial knowledge within some spurious all-embracing *logique*. The challenge, however, is firstly for faculty to be open-minded to the possibilities of alternative perspectives in other domains of knowledge and, by implication, receptive to critiques about embedded assumptions in their own spheres of expertise. The second challenge is for faculty to represent oppositional states to students in a way that aids understanding, rather than confuses.

Attempts at critical self-reflection are likely to be more readily welcomed by the immediate teaching team who are committed to making it work. However if, as in this case, the systems approach is intended to penetrate the entire programme, this requires wider receptivity across the faculty which may not be so easy to secure. As Mingers (2000: 221) has suggested "The prevailing view within business schools and management departments is the utilitarian one that management education is primarily concerned with enhancing managerial effectiveness." This does not sit easily with a more critical orientation. The harnessing of faculty commitment is explored in the next section.

The Need to Establish the Credibility of the Systems Approach
The redesign process not only challenged our tolerance for different perspectives but reinforced the need for an overarching approach to make sense of such differences. As argued above systems thinking, especially in more recent iterations, has the potential to offer a holistic understanding whilst simultaneously providing a framework in which alternative positions can be counterpointed. However this view is not necessarily supported by all academics and there is thus the need to build support within the faculty.

This was certainly the case here. Even though systems research had long been carried out in the institution and systems thinking was already included in the school's MBA, its place in the curriculum was not always accepted unquestioningly. The MBA syllabus is already over-crowded and the legitimacy of existing as well as new inputs has continually to be re-affirmed. Debates about what should be included or excluded can be seen as territorial skirmishes in which individual faculty members advance or defend their own claims to have

expert knowledge of central import to the programme. Prominence given to systems thinking implies the privileging of this area over others and is a signifier of perceived status differentials between academic areas and, potentially, academics. How much more problematic then, might it be to introduce it into other programmes where systems thinking has no history or advocates, particularly if, as Podolny (2009) claims, (most) 'business schools don't develop students' powers of critical thinking and moral reasoning'. The academic soil has to be fertile for systems thinking to take root and this may not be the case in all institutions, especially if the legitimacy of this topic rests on a historical, functionalist, understanding rather than an appreciation of its more recent critical orientation.

The Need to Develop New Pedagogies
Since the main elements of critical systems thinking were covered in the Managing Holistically element, it was important to make the philosophy and structure of this component clear to the students. Since systems thinking may appear somewhat abstract and arcane to students immersed in the world of practice we found that it was important to ground the concepts and ideas.   This was facilitated by drawing on the students own personal experiences and requiring them to:
- address their own 'messes' and how these might be tackled using a systems approach. Besides facilitating the application of theory to practice, the use of different systems methodologies in their own situations assisted students with the crucial contextualization of these ideas.
- reflect on their experience of other core modules studied in the MBA programme and explore how paradigm shifts can be charted in other areas of business and management and how the MBA themes can be viewed from different systems perspectives.

Even so, the need to address the different philosophies underpinning the various systems and management approaches to enable students to develop skills in dealing with multi-methodologies was demanding for staff as well as students. Although we already had an established portfolio of strategies for teaching the individual methodologies and their use in creative combination, the challenge of developing exercises to encourage students to apply systems thinking to their own MBA learning experience was something new.   It is unquestionably demanding to devise experiences that facilitate the shift of mind that comes about when one is able to grasp the whole not merely the parts. One of the ways we attempted this was through the creation of an exercise based on concept mapping involving the creation of a 'live' concept map in the classroom. Ropes of different colour and varying thickness were used to demonstrate the strength of association between the different modules and paradigms. Captured from above, the whole representation of the MBA can be seen but at the lower level, when 'in' the system, those things that are closest are visible, and hence understanding is limited to this. The exercise therefore affords both a physical and metaphorical appreciation of holistic thinking.

Students
We have already touched upon some of the challenges for students in our attempts to introduce critical systems thinking. Certainly, there is a need to be clear about the objectives of the course, a need to reassure students about the parameters for assessing the legitimacy of the subject matter, to take into account potential cultural sensitivities and to be mindful of the challenges that this subject poses for all students. More than this, the Managing Holistically component necessitated addressing the different philosophies underpinning the various systems and management approaches and becoming familiar with coping with multi-

methodologies. Students not only need a deep theoretical and practical appreciation of the range of theories, but also to be aware of personal prejudices and preferences when making choices between approaches, and this is not straightforward.

More prosaically, while the themes represented our view of what the MBA encompassed, it was soon realized that the need to conform, at least in part, to student expectations meant that the traditional areas of management also had to be distinguished. Students require the familiar core constituents of an MBA programme to be readily identifiable (so, too, do accrediting bodies such as AMBA, the Association of MBAs). Thus one of the challenges in embedding holistic approaches in the MBA is to effect an acceptable balance between emphasising connectedness and acknowledging accepted demarcations between different knowledge domains.

In terms of student performance this was highly satisfactory in that the overwhelming majority passed their assessments in the Managing Holistically module; however, this is a crude indicator since students must achieve a pass whether or not they subscribe to the material and overarching philosophy. Some students clearly struggled more with the second part of the module and this aligned with the lecturer's and the external examiner's view that students had approached this part of the assignment rather superficially. Therefore later classroom sessions utilized a framework to help with this aspect by making explicit student perceptions of how the different modules and themes reflected different paradigms. Some students elaborated on this framework in their assignments where they attempted to critically reflect on the history of different areas of management as well as the limitations and potential future developments in these areas. This proved to be a useful way of prompting reflection about the nature and status of managerial knowledge as portrayed through the MBA.

To complete the feedback loop examples of the frameworks produced by students were fed back to lecturers involved in delivering the MBA programme and this led to further discussions about how to foster the continued evolution of holistic thinking across the MBA. Several new ideas emerged, such as the use of Collier's (2009) multi-paradigmatic view of accounting information for decision making and the use of concept maps in the research methods module to help students see connectivity between related concepts and the need to define an appropriate boundary to their areas of proposed research study.

CONCLUSIONS
Systems thinking has a long pedigree and there are on-going debates about how far it has relevance for contemporary management learning. It is argued here that systems thinking can reveal how a preoccupation with the apparently separate elements of business and management can lead to myopic thinking and impoverished decision-making. Critical systems thinking offers the possibility of a more holistic and searching approach. However this paper has also demonstrated that while systems thinking may address some concerns about business and management education there are challenges for faculty and students. Developments in systems thinking have moved the discipline forward but this is a continuing process. As Churchman (1968) has suggested, we need 'to see systems design as a never ending process' and to pursue it in the 'heroic mood'. It is clear that both systems thinking and management education need to evolve to ensure their relevance in an increasingly interconnected, multi-layered and unpredictable world. It may be that they can do so to mutual advantage; it may be that the wave is gathering strength once more.

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