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# Using mind maps to study how business school students and faculty organize and apply general business knowledge



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## ABSTRACT

Concerns have been raised that business school pedagogy has limited students' intellectual development with respect to integrative thinking, synthetic reasoning and the ability to analyze complex problems. Mind maps were used in this study to explore these concerns. Specifically, undergraduate and MBA students, and business school faculty performed a mind mapping exercise for a complex, multifaceted problem. Results supported concerns about students' intellectual development. Mind maps indicated that advanced undergraduate and advanced MBA students partitioned knowledge into distinct silos and that their knowledge bases were thin. In contrast, business school faculty developed rich mind maps characterized by dense connections among concepts. Implications of these findings for business school pedagogy were discussed.

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## 1. Introduction

An ongoing, spirited debate about the future direction of management education is evident in the recent literature. Concerns about management education are broad in scope and include the preparedness of business school graduates for managerial and professional positions (Bennis & O'Toole, 2005; Raelin, 2009; Rousseau, 2012), the relevance of business school curricula to management practice (Gosling & Mintzberg, 2006; Mintzberg, 2004), and the degree to which business school pedagogy develops critical thinking (Kilpatrick, Dean, & Kilpatrick, 2008; Starkey & Tempest, 2009).

One area that has received increased interest in the recent literature is the intellectual development of business school graduates. It has been suggested that business school pedagogy is centered on small, simple problems that limit students' abilities in the areas of critical thinking, integrative thinking, creativity, and synthetic reasoning (Kilpatrick et al., 2008; Starkey, Hatchuel, & Tempest, 2004; Starkey & Tempest, 2009). Consequently, business school graduates are seen as not fully prepared to address the complex, interdisciplinary problems characteristic of management practice (Mintzberg, 2004; Pfeffer & Fong, 2004; Raelin, 2009).

Although there has been an ongoing interest in integrative learning in the management education literature, it is usually within the context of specific courses (cf., Corner, 2002; Stewart, Houghton, & Rodgers, 2012) or in terms of functional integration within a capstone course (cf., Flannery & Pragman, 2010; Stephen, Parente, & Brown, 2012). Much less attention has been paid to the manner in which students organize and assimilate knowledge, especially when management is

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compared to other disciplines with a practice orientation such as nursing or engineering (cf., [Abel & Freeze, 2006](#); [Mueller, Johnson & Bligh, 2001](#)).

This study adds an empirical dimension to concerns about business students' intellectual development by using mind maps to explore the manner in which they organize and apply data to solve a complex, ambiguous problem. We begin with a discussion of concerns about management education. Next, we explain mind mapping as a methodology to assess the problem-solving approaches of undergraduate business students, MBA students and business school faculty. The paper concludes with recommendations for business school pedagogy derived from a mind mapping exercise.

## 2. Background

### 2.1. Criticism of business school pedagogy

Critics have suggested that business school pedagogy emphasizes instructional methods that are focused on tangible, quantifiable skills that are limited in scope ([Colby, Ehrlich, Sullivan, & Dolle, 2011](#); [Kilpatrick et al., 2008](#); [Shoemaker, 2008](#)). They argue that an emphasis on targeted, intra-functional learning occurs at the expense of higher-order cognitive skills related to critical and integrative thinking, and synthetic reasoning ([Raelin, 2009](#); [Starkey & Tempest, 2009](#)).

Undergraduate business education has been characterized as the default major at university. A survey of American students found that a business major was viewed as less intellectually demanding than were degree programs in the sciences and liberal arts ([Glenn, 2011](#)). This point was reinforced by an extensive analysis of business programs in the United States in which it was suggested that undergraduate education would benefit from increased emphasis on the critical thinking and creativity that is reinforced with intellectual rigor ([Colby et al., 2011](#)).

Similar concerns have been raised about MBA programs. Several prominent writers have suggested that MBA programs present students with stylized, simplistic problems that are not related to management practice (cf., [Bennis & O'Toole, 2005](#); [Khurana, 2007](#); [Mintzberg, 2004](#)). [Bennis & O'Toole \(2005\)](#) make the point that business school cases do not map well to business problems because they are too simple and too structured to capture the complexity of managerial work. As a result, MBA students do not develop the depth of thinking necessary to analyze problems of practice. [Mintzberg \(2004\)](#) makes an even stronger case arguing that MBA curricula have no relationship to managerial work so that business schools are graduating MBA's and not managers. Finally, [Khurana \(2007\)](#) suggests that MBA programs are graduating technicians and not professional managers.

Business school faculty are seen by critics of management education as exacerbating these problems. The emphasis on rigorous academic research in business schools has been criticized as focusing business school faculty on publishing highly technical papers that are limited in scope and that have little relationship to management practice ([Bennis & O'Toole, 2005](#); [Khurana, 2007](#); [Mintzberg, 2004](#)). This orientation toward parsimony and rigor in academic research is thought carry over to curricula and pedagogy which is reflected in an emphasis on models and markets at the expense of other dimensions of managerial work ([Datar, Garvin, & Cullen, 2011](#)).

### 2.2. Mind maps

Mind mapping is a technique in which thought processes are represented visually by connecting concepts and ideas related to a central issue or problem ([Buzan, 1995](#)).

The process begins by placing a thought or focus area in center of the map. This represents the problem or issue to be addressed. Branching from the central focus are groups of related concepts. These concepts are then linked with arrows that demonstrate associations among them. Thus, mind mapping allows the process of solving a problem to be viewed holistically and there is evidence that using mind maps as a learning tool encourages both left and right brained thinking ([Wycoff, 1991](#)).

Mind maps provide insights into the manner in which people deploy and organize knowledge by capturing concepts deemed relevant to a particular problem ([Kern, Bush, & McCleish, 2006](#)). They have been used to both assess and facilitate student learning in academia in several disciplines including the social sciences ([Budd, 2004](#)), nursing ([Kern et al., 2006](#)), engineering ([Zampetakis & Tsironis, 2006](#)), and business ([Mento, Martinelli, & Jones, 1999](#)). Research in engineering education indicates that mind maps enhance student creativity ([Zampetakis & Tsironis, 2006](#)) while mind maps in EMBA programs helped students to integrate diverse higher-order constructs and to develop metaphorical thinking ([Mento et al., 1999](#)).

## 3. The study

### 3.1. Purpose

The purpose of this study was to examine the manner in which business students and faculty frame and analyze complex problems. It addresses several gaps in the management education literature. To begin with, assessment of students' ability to integrate and apply knowledge is usually course specific, and when assessments are more general, they are usually focused on

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