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Using mind mapping literature to enrich the subject of managerial intellectual learning (MIL): an exploratory exercise

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Abstract:

The subjects of mind mapping and managerial intellectual learning (MIL) both share the goals of using diagrams to improve intellectual learning. Although the two subjects are conceptually based on different theories, their theoretical groundings are not incompatible. Thus, it is useful to conduct a literature review on mind mapping to draw on mind mapping concepts and practical advices for enrichment of MIL subject. This exploratory exercise takes up this task and comes up with some conceptual findings. Finally, the paper encourages more research efforts on cross-fertilization of ideas between the mind mapping and MIL fields.

Key words: diagramming-based literature review, literature review, managerial intellectual learning (MIL), mind mapping

INTRODUCTION

In the subject of managerial intellectual learning (MIL), launched by Ho in 2013 (Ho, 2013), the use of diagramming, e.g., multi-perspective, systems-based frameworks, cognitive maps, rich pictures, systems diagrams and mind maps, has been recognized as a vital learning approach (Ho, 2015). These

diagrams facilitate the rendering of knowledge structures, some general while others context-specific; they constitute the cognitive filters for managers to cope with issues and concerns in their world of management practices. Recently, diagramming-based literature review, using mind mapping, systems mapping and cognitive mapping, is specifically investigated by this writer as a topic in managerial intellectual learning (Ho, 2016a; 2016b; 2016c). This paper takes a closer look at the literature on mind mapping with the two aims of (i) more clearly establishing the conceptual rationale of diagramming for managerial intellectual learning [aim 1] and (ii) enriching the subject of managerial intellectual learning with ideas from the mind mapping literature [aim 2]. Aim 1 is more specific than aim 2 and they are closely related. Such an intellectual endeavour is essentially a literature review exercise to contribute to the theoretical development of managerial intellectual learning; it is a theoretical exercise, not an empirical study. The paper comprises of a brief literature review on mind mapping and managerial intellectual learning (MIL). Built on the literature review knowledge, it then examines how to enrich MIL with mind mapping ideas.

THE MAIN IDEAS UNDERLYING THE MIND MAPPING LITERATURE

Mind mapping was initially proposed by Tony Buzan in 1974 (Buzan and Buzan, 1995). Similar exercises could be traced back to the third century on illustration of Aristotle's ideas (Gotz, 2012); it was also inspired by Leonardo da Vinci's notebooks, among others (Buzan and Buzan, 1995). For Buzan and Buzan (1995), a mind map is an expression of Radiant Thinking. And Radiant Thinking is explained as "associated thought processes that proceed from or connect to a central point". The underlying mind mapping ideas as explained in the

literature are grouped into the following five categories by this writer:

Category 1: On mind mapping characteristics (4 ideas)

Idea 1.1. Mind mapping supports learning that is idiosyncratic and experiential-based (Abi-El-Mona and Abd-El-Khalick, 2008);

Idea 1.2. Mind mapping promotes conceptual links among ideas in non-linear and holistic ways for meaningful learning (Abi-El-Mona and Abd-El-Khalick, 2008);

Idea 1.3. Mind mapping utilizes "the full range of cortical skills – word, image, number, logic, rhythm, colour and spatial awareness – in a single uniquely powerful technique" (Buzan and Buzan, 1995);

Idea 1.4. Mind mapping promotes active learning instead of passive learning[1] (D'Antoni *et al*., 2009);

Category 2: On mind mapping activities and techniques (9 ideas)

Idea 2.1. Basic mind mapping steps comprises (i) arm yourself with blank papers and colored felt-tip pens, (ii) get into the frame of mind for new and creative thought, (iii) select key word or image, (iv) branch off ideas from the central theme, (v) apply one color for each branch, (vi) use one word for each branch, (vii) usage of images is preferred over words, and (viii) refigure, refine and finalize your mind map (Anon., 1998);

Idea 2.2. Group mind mapping chiefly involves seven stages: (i) "defining the subject", (ii) "individual brainstorming", (iii) "single group discussion", (iv) "creation of first multiple mind map", (v) "incubation", (vi) "second

[1] *Passive learning* is "learning strategies that emphasize memorization without an attempt to connect and understand information" while *active learning* "encourages interconnectivity [between information] and engages the learner in activities that promote meaningful learning" (D'Antoni *et al*., 2009).

reconstruction and revision", (vii) "analysis and decision making" (Buzan and Buzan, 1995);

Idea 2.3. Mind mapping enables sketching out main ideas and their relatedness before "committing words to paper" (Buzan and Buzan, 1995);

Idea 2.4. Different views of participants in discussion sessions can be distinguished in a mind map with different colours (Burgess-Allen and Owen-Smith, 2010);

Idea 2.5. Mind mapping is not only used for note-taking (i.e., summarizing thoughts) but also for note-making (i.e., organising thoughts) in individual and group settings (Buzan and Buzan, 1995; Burgess-Allen and Owen-Smith, 2010);

Idea 2.6. For focus group discussion, participants could comment and make corrections on the evolving mind map (Burgess-Allen and Owen-Smith, 2010);

Idea 2.7. In focus group sessions, participants are encouraged to "sort the emerging concepts into categories" themselves so as to avoid researchers' bias in qualitative data analysis (Burgess-Allen and Owen-Smith, 2010);

Idea 2.8. Skilful facilitators are required for employing mind mapping in focus group sessions (Burgess-Allen and Owen-Smith, 2010);

Idea 2.9. Quality of mind maps could be assessed with mind map assessment rubric (MMAR) (D'Antoni *et al*., 2009);

Category 3: On theoretical justifications (5 ideas)

Idea 3.1. Human brain functions much better when its physical and intellectual skills work together harmoniously (Buzan and Buzan, 1995);

Idea 3.2. Mind mapping reflects human's natural thinking patterns (Buzan and Buzan, 1995);

Idea 3.3. Mind mapping allows an expanding endeavor of associative 'probes' to investigate idea and questions, which

is compatible with the gestalt nature of human brains' working (Buzan and Buzan, 1995);

Idea 3.4. Human brains are better at remembering things that are: (i) appealing to any of the five senses, (ii) interesting, (iii) outstanding, and (iv) associated to things already learned (Buzan and Buzan, 1995);

Idea 3.5. Mind mapping is in line with cognitive constructivist theory thinking. With this thinking, "in the process of construction of new information, previous knowledge structures may undergo transformation, including (a) conceptual growth (structures will be partly supplemented or broadened) or (b) conceptual change (rearrangement of existing and/or development of new cognitive structures) as the learners actively searches for ways to merge new knowledge within existing frameworks" (Dhindsa *et al*., 2010);

Category 4: On benefits and limitations of mind mapping usage (10 ideas)

Idea 4.1. Mind mapping enables speedy qualitative data gathering and data analysis with focus groups; as a result, more focus group sessions can be conducted (Burgess-Allen and Owen-Smith, 2010);

Idea 4.2. Mind mapping aids "intellectual exploration and growth", thus also increasing changes of "mental breakthroughs" (Buzan and Buzan, 1995);

Idea 4.3. Mind mapping makes free thinking, e.g., on reflection of a subject's assumptions, more feasible (Burgess-Allen and Owen-Smith, 2010);

Idea 4.4. Group mind mapping enables and stimulates participants to discuss themes and issues more holistically (Burgess-Allen and Owen-Smith, 2010);

Idea 4.5. In business settings, mind mapping enhances creativity, memory, learning, cooperation, progress monitoring and goal envisioning (, 1998);

Idea 4.6. In education settings, online mind mapping promotes occurrence of long-term memory, interaction among students, construction of knowledge frameworks and personal knowledge management (Liu *et al.*, 2015);

Idea 4.7. In the education setting, mind mapping enhances the visibility and logic correlation among knowledge points in learning (Wang *et al.*, 2014);

Idea 4.8. Mind mapping is especially useful (i) with "communities whose cultures are strong on visual communication" and (ii) in cross-cultural situations where learners are weak in written English (Lloyd *et al.*, 2010);

Idea 4.9. Mind mappers could experience difficulty to capture contradictory or unclearly expressed comments in group discussion (Burgess-Allen and Owen-Smith, 2010);

Idea 4.10. Mind mapping is good at dealing with "what"-type of questions, but less so with "why"-type questions (Burgess-Allen and Owen-Smith, 2010);

Category 5: On application domains (6 ideas)

Idea 5.1. Mind mapping applications include: (i) group mind mapping for joint creativity, combined recall, group decision-making, group project management, (ii) training and education, (iii) self analysis, (iv) personal problem-solving, (v) mind map diary, (vi) mind mapping a book, (vii) mind mapping for time management, (viii) mind mapping for meetings, (ix) mind mapping for essays, (x) mind mapping for examination, (xi) mind mapping for presentation, (xii) mind mapping for personal information management and (xiii) computer-based mind mapping (Buzan and Buzan, 1995; Naqbi, 2011; Pollitt, 2003; Fourie, 2011; Abi-El-Mona and Abd-El-Khalick, 2008; Lloyd *et al.*, 2010; Gellert and Cristea, 2010; Zampetakis and Tsironis, 2007);

Idea 5.2. Online mind map can serve as interface of learning resource integration and sharing (Liu *et al.*, 2015);

Idea 5.3. Interactive mind map widgets can be employed to enhance documents classification and retrieval (Xuan *et al.*, 2013);

Idea 5.4. Mind mapping can be employed in computerized visualization for text analysis, e.g., for expression of wine taste (Hirokawa *et al.*, 2014);

Idea 5.5. Mind mapping has been employed for computer-supported collaborative learning (Koznov and Pliskin, 2008);

Idea 5.6. Mind mapping has been employed to model semistructured documents in software development projects (Bia *et al.*, 2010);

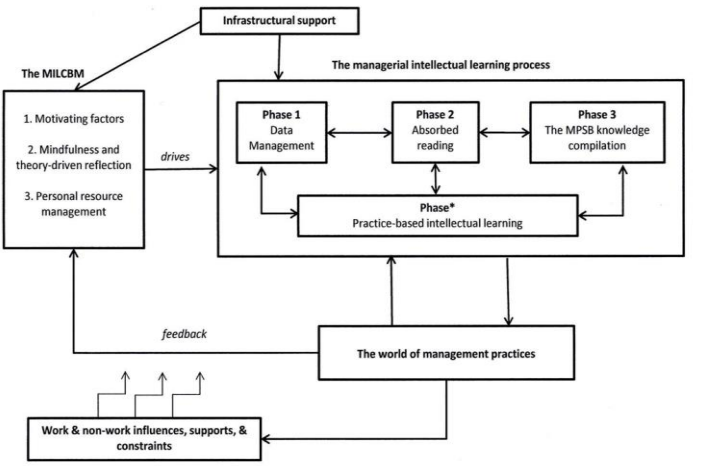
On the whole, some of the mind mapping ideas are more related to diagramming practices while others are primarily associated with intellectual learning. The former group of ideas is useful to answer aim 1 of this paper while the latter group is more informative to deal with aim 2. Together, these representative ideas from the literature reveal the nature and rationale of the mind mapping subject. This conceptual overview of mind mapping informs the following discussion on the main MIL ideas and the enrichment of MIL with mind mapping ideas.

THE MAIN IDEAS UNDERLYING MANAGERIAL INTELLECTUAL LEARNING (MIL)

The full name of managerial intellectual learning (MIL) is multi-perspective, systems-based (MPSB) managerial intellectual learning (Ho, 2015). There are 9 topics in the primary MIL study domain and 3 topics in the secondary MIL study domain (Ho, 2015). In this paper, two main MIL ideas are singled out to facilitate the discussion. The first MIL idea is the **MPSB managerial intellectual learning** (or simply called managerial intellectual learning (MIL). It is defined as the Multi-perspective, Systems-based intellectual learning by people of management concepts to be employed to inform real-

world management practices. The second MIL concept is the **managerial intellectual learning process** (re: Figure 1). It is described in the form of a process framework with four phases. They are: (i) Data Management, (ii) Absorbed reading, (iii) the MPSB knowledge compilation, and (iv) Practice-based intellectual learning (Ho, 2014).

Figure 1: An integrated view on the managerial intellectual learning process



The first concept of MIL (on "what is MIL") underlines the theoretical anchoring of managerial intellectual learning on the MPSB Research while the second concept of the MIL process (on "how to do MIL"), as illustrated in Figure 1 (Ho, 2014), portrays a set of inter-related learning activities. From a literature review perspective, data management in the MIL process is primarily a literature search as well as preliminary literature review endeavour. Note-taking is significantly involved in data management. Via data management, conceptual growth is experienced. As to absorbed reading, another MIL activity, a more intensive effort is made to memorize, understand and critically reflect on the literature of a theme under investigation; in this case, note-making (re: mind mapping idea 2.5), rather than note-taking, is carried out.

Via absorbed reading, conceptual change and mental breakthrough (re: mind mapping ideas 3.5 and 4.2) are experienced. With the MPSB knowledge compilation, the activity and experience are similar to that of absorbed reading, except that (i) a set of MPSB concepts are explicitly employed in the intellectual learning and (ii) MPSB knowledge structures (i.e., the MPSB frameworks) are constructed in this MIL absorbed reading phase. Lastly, practice-based intellectual learning is chiefly action learning-oriented as well as context-specific. This learning phase is informed by the other MIL learning phases and vice versa. Also, regarding Figure 1, diagramming-based literature review as elaborated on by Ho (2016a; 2016b; 2016c) is primarily carried out in the phases of Data Management, Absorbed reading and the MPSB knowledge compilation. Diagramming is also employed in the Practice-based intellectual learning phase, but it is not for literature review purpose. It is not the intention of the writer to go into details to elaborate on MIL and the more encompassing intellectual project of the MPSB Research. Readers are referred to the respective Facebook pages (re: the ***bibliography***) for further information on topics of MIL and the MPSB Research). There is a also a Facebook page on mind mapping (re: the ***bibliography***). The next section takes up the intellectual exercise to enrich the concepts of MIL and the MIL process with mind mapping ideas.

ENRICHING MIL WITH MIND MAPPING IDEAS

Both MIL and mind mapping share the common goals of promoting effective intellectual learning in the face of explosion of information and knowledge in the contemporary environment of learning and management practices. For examples, university e-libraries and Internet search engines, as literature search tools, are powerful these days. In particular, MIL and mind mapping are both interested in:

(i) stimulating holistic and creative thinking in intellectual learning;
(ii) facilitate efficient and effective intellectual learning;
(iii) improving managerial practices via effective learning, both individual and group-based;
(iv) using diagramming to enhance and make visible knowledge structures generated in intellectual learning;

It is clear that MIL is grounded on critical systems thinking/ the MPSB Research while mind mapping is based on Radiant Thinking and cognitive constructivist theory (re: mind mapping idea 3.5); their theoretical foundations are not the same, though not mutually exclusive. In this paper, the aims are to (i) more clearly establish the conceptual rationale of diagramming for MIL and (ii) enrich the MIL subject with the mind mapping literature. This is now done in the form of Table 1.

Table 1: The two MIL concepts and related mind mapping ideas

The two main MIL concepts	**Related mind mapping ideas for MIL idea clarification and enrichment**
1. Managerial intellectual learning (MIL)	The four ideas from category 1 (on mind mapping characteristics) and the five ideas from category 3 (on theoretical justifications) are highly compatible with MIL; they serve to clarify the characteristics of MIL.
2,1 The managerial intellectual learning process: data management	Using mind mapping for (i) note-taking (idea 2.5), (ii) associative probing (idea 3.3), (iii) conceptual growth (idea 3.5), and (iv) promoting long-term memory (idea 4.6), is especially relevant for this phase of the MIL process. The mind mapping know-how (re: category 2) also offers practical advice on how to conduct MIL data management.
2.2 The managerial intellectual learning process: absorbed reading	Using mind mapping for (i) note-making (idea 2.5), (ii) associative probing (idea 3.3), (iii) qualitative data analysis (idea 4.1), (iv) intellectual exploration and mental breakthroughs (idea 4.2), and (v) visibility enhancement and logic correlation (idea 4.6) is especially relevant for this phase of the MIL process. The mind mapping know-how (re: category 2) also offers practical advice on how to conduct MIL data

	management.
2.3 The managerial intellectual learning process: the MPSB knowledge compilation	The mind mapping know-how (re: category 2) offers practical advice on how to construct MPSB knowledge structures in this MIL phase (the MPSB knowledge compilation). The existing mind mapping literature does not consider the subject of the MPSB Research at all.
2.4 The managerial intellectual learning process: Practice-based intellectual learning	Idea 1.1, which expresses mind mapping support to idiosyncratic and experiential-based learning, is highly relevant here. The mind mapping know-how (re: category 2) offers practical advice on how to make use of mind mapping to conduct practice-based intellectual learning. Category 5 (application domains) provides examples of "practices" in practice-based intellectual learning; this category also indicates how computer-based mind mapping can be employed in this MIL process phase.

Regarding Table 1, the mind mapping ideas are related to the two main MIL concepts, i.e., (i) managerial intellectual learning and (ii) the managerial intellectual learning process. The table indicates that mind mapping ideas from its literature is quite able to contribute to the theoretical enhancement of MIL and MIL practices. Thus, the intellectual value of mind mapping to MIL study is clearly established in this exercise. In the writer's view, MIL is also capable of enhancing mind mapping theories and practices. This topic of how to enrich mind mapping with the MIL literature is not dealt with here, though. In short, there are substantial benefits in cross-fertilization of idea between the fields of MIL and mind mapping.

CONCLUDING REMARKS

The intellectual exercise presented in this paper chiefly relies on literature review by this writer to achieve two aims:
Aim 1: more clearly establishing the conceptual rationale of diagramming for managerial intellectual learning;

Aim 2: enriching the subject of managerial intellectual learning with ideas from the mind mapping literature.

Both aims have been met via the exercise in the form of Table 1. Specifically, in the mind mapping literature, some mind mapping ideas are about diagramming while others are mainly on intellectual learning. The intellectual endeavour conducted here is novel in both the MIL and the mind mapping fields. For instance, so far, the mind mapping literature has not considered the MPSB Research and the MIL subjects. This conceptual exercise is, however, brief. Thus, more research works both theoretical and empirical, need to be carried on this topic of ideas cross-fertilization in the future. It is worth doing, given its substantial academic and practical values as well as newness in the mind mapping and MIL fields.

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