

The application of mind mapping as a technique to enhance collaborative, creative, and innovative learning among Geography undergraduates

Ananda Karunarathne^{*}, W.A.M.K. Weerasinghe²

^{*}Department of Geography, University of Colombo, ²Assistant Director, Zonal Education Office, Getangama, Rathnapura.

ABSTRACT

Mind mapping can be considered a method that helps students to enhance and accelerate their learning capacity effectively in a creative and innovative manner. This method is also popular as an efficient brainstorming technique. Tony Buzan (founder of the strategy) pointed out that it is an extremely effective technique for sharpening the thinking and learning process. Thus the aim of this study was to apply the mind mapping technique to enhance collaborative, creative, and innovative learning among Geography undergraduates. In this context, the technique was applied to the first year undergraduates who followed the Cartography Course Unit (GYG 1102 / GYG 1202) at the Department of Geography, University of Colombo in 2012. All the students of the Cartography Course Unit were included in the study (population = sample). According to literature, this technique has not been tried out with Geography undergraduates in Sri Lanka. The resultant mind maps revealed that the students were able to think and analyze one aspect from different perspectives (angles) very creatively. This was the main benefit that they obtained from this practice. The technique was also identified as one of the best techniques that can be applied in many situations of the learning process. Analysis of students feedback revealed that 86 per cent of students identified mind mapping as an active, creative, and collaborative learning technique. The practice enabled students to be more innovative in their learning process. Some students supposed that they can apply the technique successfully to another situation also and some expressed that they can relate the experience significantly in different contexts. Mind mapping was identified as an effective practice that helped students to enhance their learning capacity.

Keywords: *Mind Mapping, Creative & Collaborative learning, Geography, Brainstorming*

INTRODUCTION

The need for collaborative and innovative learning techniques in higher education has been well documented in general. The focus of higher education is shifting from “teaching” to “learning” today. Faculty roles are changing from lecturing to being primarily “designers of learning methods and environments” (Wirth and Perkins, 2008). Mind mapping can be used to express ideas, views, and concepts in a graphical way. This method is one of the best ways to conceptualize information. Mind mapping can be used for a variety of learning purposes such as, listing, presentation, effective note taking, problem solving, project planning, decision making, strategic planning, brainstorming, and knowledge management. Thus, the mind mapping technique has been applied as a learning method to enhance learning capacities of Geography undergraduates.

Tony Buzan, the founder of mind mapping, pointed out that it is an extremely effective technique for sharpening the thinking and learning process. It can be used in nearly every

activity where thought, planning, recall or creativity are involved (Buzan, 1989, cited in Mento *et al*, 1999). Their study reveals that by adding a visual and spatial dimension to generating and selecting information, mind maps show how metaphors promote ease of understanding when one element of experience is described in terms of another (Mento, Martinelli & Jones, 1999). A study by David Pollitt concludes that the mind map is one way of integrating many of the brain's learning skills and principles. By combining the full range of the brain's cortical skills, the mind map can enhance creativity and improve learning (Pollitt, 2003, p. 253).

Mind mapping takes into account the fact that the two halves of the human brain perform different tasks. While the left side is mainly responsible for logic, words, arithmetic, linearity, sequences, analysis, and lists, the right side of the brain mainly performs tasks like multidimensionality, imagination, emotion, colour recognition, rhythm recognition, shapes, geometry, and synthesis. Mind mapping uses both sides of the brain (Buzan, 1976, Cited in Brinkmann, 2003). John W. Budd applied mind mapping to his economics classes and theorized that the creation of a mind map in a small group is an active and collaborative learning exercise. He noticed that a mind map captures a specific topic in a nonlinear fashion and incorporates graphics and colors. This exercise can also resonate with learners whose style is not as well-served by traditional, linear, text-based materials (Budd, 2004, p.36). Mind mapping engages the mind and focuses on using visuals along with the traditional verbiage from lectures and tests, and this has a powerful effect on increasing learning speed and later recall (Zampetakis, Tsironis, & Moustakis, 2007). As Biggs & Tang (2007) noted, creating a concept map is a learning experience for the students, helping them to explicitly structure their thinking, and at the same time, the giving an indication of how the student sees the way in which individual concepts relate to each other. Another dimension emphasized by Mento, Martinelli & Jones (1999) is that mind mapping is a creativity and productivity enhancing technique that can improve the learning and efficiency of individuals and organizations. It is a revolutionary system for capturing ideas and insights horizontally on paper.

However, up until now there have been no systematic studies published in the literature related to geography on learning styles. Kolb (figure 1) theorizes that effective learning involves four key elements: concrete experience, reflective observation, abstract conceptualization, and active experimentation (Healey, Kneale, & Bradbeer, 2005). In this context, this study focused on that how to apply mind mapping techniques to enhance the learning capacity of Geography undergraduates.

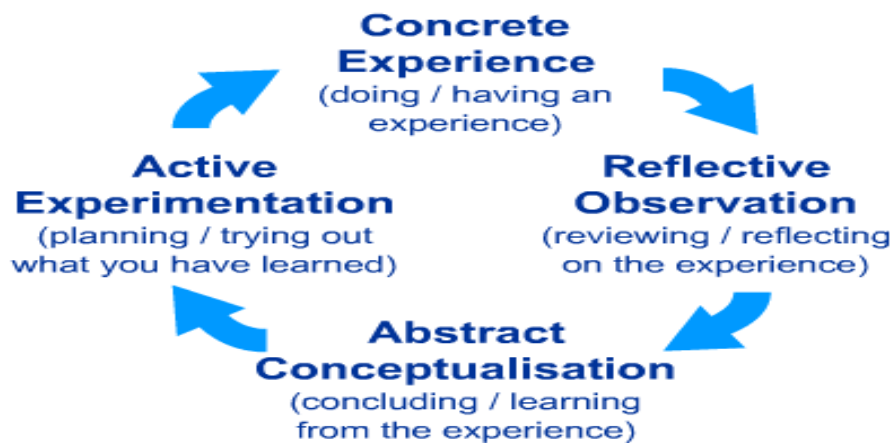


Figure 1: Kolb's Learning Cycle

Source: http://www.ldu.leeds.ac.uk/ldu/sddu_multimedia/kolb/static_version.php (Accessed: 15-05-2012).

Where;

- **Concrete Experience (CE)** is for those who enjoy being involved in a new experience.
- **Reflective Observation (RO)** is preferred by those who are comfortable watching others or developing observations about their own experience.
- **Abstract Conceptualization (AC)** is about creating theories to explain observations.
- **Active Experimentation (AE)** involves activities such as using theories to solve problems.

OBJECTIVES

To apply mind mapping technique in order to enhance collaborative, creative, and innovative learning among Geography undergraduates

To train students to use mind mapping techniques in their learning process

METHODOLOGICAL BACKGROUND

The study involved first year undergraduates at the Department of Geography, University of Colombo who followed the Cartography Course Unit (GYG 1102) in 2012. All of them (59 students) were included in the sample and 54 out of 59 were female students. The students were divided into four groups (Group 1 had 14 students while Group 2, Group 3, and Group 4 had 15 students respectively), and were given the same topic ("The Mapping Process of Cartography") to create mind maps. They were provided with large Bristol

boards, colored markers, and other required materials. The groups were given approximately two hours to construct a mind map. Their feedback was also collected in order to analyze their experiences and insights on this exercise. Two assistant lectures facilitated and supported students. This study will be added to the Geography literature as the first attempt to apply mind mapping technique to enhance the learning capacities of Geography undergraduate in Sri Lankan context.

RESULTS

All the students were actively involved in using the new strategy and finally, four mind maps were produced by them as a result of the collaborative effort. Within the given period of time, all the groups were able to classify, analyze, and demonstrate new aspects, thoughts, and dimensions on the given topic.

C. Meyers and T.B. Jones pointed out that the creation of mind maps in small groups instead of by individual students facilitates a deeper analysis of the topic through brainstorming. Moreover, small group activities allow students to voice their ideas, support their ideas with evidence, listen to other points of view, and gain confidence (Meyers and Jones 1993, Cited in Budd, 2004). In this practice, each group consisted of five to twelve students and all members contributed with their ideas and thoughts. Their final products were more impressive and innovative as all of the students were cartography students. They had portrayed their insights graphically in analytical and artistic ways on their mind maps (figures 2, 3, 4, 5, 6).



Figure 2: Conceptualizing and making mind maps as collaborative effort,
Date:02.07.2012.



Figure 4: Resultant mind map of group 2 with some representatives, Date: 02-07-2012.



Figure 5: Resultant mind map of group 3 with some representatives, Date: 02-07-2012.



Figure 6: Resultant mind map of group 4 with some representatives, Date: 02-07-2012.

All the groups made their mind maps on the same topic. However, the resultant mind maps contained graphical structures that were totally different from each other. Also, they had analyzed the topic from different dimensions. In this way, they had expressed their creative and innovative thoughts collaboratively. The use of different colors made the resultants mind maps more effective. Brinkmann remarked that the method of mind mapping and concept mapping were not invented as educational tools, but it was found that these methods are useful in a variety of applications in teaching and learning processes (Brinkmann, 2003). Figure 3, 4, 5, and 6 show that students were able to thoughtfully express relationships among different cartographic techniques through their mind maps. Table 1 represents the key characteristics and differences among the resultant mind maps.

Table 1: Comparison matrix of resultant mind maps

	Group 1(G1)	Group 2 (G2)	Group 3(G3)	Group 4 (G4)
Group 1(G1)		(2-3) G 1 analyzed many sub headings with their logical links. G2 used symbols to explore links. Both used many colors for different meanings. G1 used the globe as the central image.	(2-4) G3 linked relationships of sub headings in new ways. G 1 analyzed many sub topics with their logical links. Both used many colors and the globe as the central image.	(2-5) G3 explored links of sub and sub-sub headings by using many symbols. G 1 analyzed many sub topics with their logical links. Both used many colors and the globe as the central image.
Group 2(G2)	Same as the cell (2-3)		(3-4) G3 linked relationships of sub headings in new ways. G2 used symbols to explore links. Both analyzed the topic with their insights and used colors.	(3-5) Both used many colors and different symbols to explore links of sub headings. G1 explored analytical thoughts than G4. The central image of G4 is the globe and G2 used a circle.
Group 3(G3)	Same as the cell (2-4)	Same as the cell (3-4)		(4-5) Both used the globe as central image and different colors for diverse meanings. G3 revealed many analytical ideas than G4.
Group 4(G4)	Same as the cell (2-5)	Same as the cell (3-5)	Same as the cell (4-5)	

According to the results, group 3 pointed out many important dimensions of mapping processes in Cartography than did the other groups. The structure of the resultant mind maps of the groups is different from one another and that indicates how students think in different ways about one concept. All the groups have analyzed and linked key headings of the topic in many ways with the central image.

CONCLUDING REMARKS

Mind mapping brings a renewed sense of enthusiasm to the classroom because it tends to increase one's sense of competence in mastering the assigned materials (Mento, Martinelli & Jones, 1999). That sense is confirmed by the results revealed in this study. Within the given time, all the groups were able to produce their mind maps. Analysis of students' feedback revealed that a great majority of students identified 'mind mapping' as an active, creative, and collaborative learning technique. The practice enabled students to be more innovative in their learning process. They analyzed the topic 'Mapping Techniques in Cartography' in a variety of ways through different dimensions. Some students supposed that they can apply the technique successfully to another situations and some expressed the notion that they can relate the experience significantly to different contexts. mind mapping was identified as an effective practice that helped students to enhance their learning capacity.

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