The Effectiveness of Mind Mapping as a Learning Tool for Office Management and Technology Students

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Abstract

All educational system aims to improve students' ability to acquire information, as they are used to memorising facts instead of understanding and implementing the concept. Students must engage in a long-term process of individual learning. As a result, an approach known as mind mapping is contended to improve their individual ability to remember and recall things and improve their academic performance. Previous studies have proven the effectiveness of mind mapping for studying, summarising ideas, retaining, and retrieving information. Thus, the objective of this conceptual paper is twofold, which are to examine the importance of computerised mind mapping as a learning approach and to determine the effectiveness of computerised mind mapping among Office Management and Technology students. The questionnaires will be distributed to semester one students enrolled in the Personality Development course since mind mapping is covered in the syllabus. This data will be analysed using Statistical Package for Social Sciences (SPSS) 26.0 to determine the effectiveness of mind mapping for the students. It is believed that this study will identify the importance of computer mind mapping in enhancing the students' performance as positive evidence and outcomes of the past researchers are briefly discussed regarding the effectiveness of mind mapping. The researchers concluded with a rationale why computerised mind mapping works with the students, especially during this challenging COVID-19 pandemic.
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Keywords: *Mind Mapping, Students' Effectiveness, Learning Tool and COVID-19*

1. Introduction

The COVID-19 pandemic has impacted all education sectors as universities transitioned from in-person to online learning. However, since the previous educational system did not prioritise online education implementation, this circumstance presents a significant barrier for educators and students. Furthermore, online learning causes a challenge for educators because most of them have limited expertise in Information Technology (IT) and no experience in teaching online. The most challenging aspect is that some educators had no prior experience with online teaching tools and software.

For online learning to be effective, educators must design a method to make the learning experience more engaging for students by developing a detailed lesson plan and learning materials (Nyagblormase, Gyampoh, Hinson, Aidoo & Yeboah, 2021). Besides, the educators must design creative teaching strategies to ensure the learning environment runs smoothly and is enjoyable. A creative and innovative learning technique would encourage meaningful learning, student participation, and positive interaction between students and educators. Khairani, Shamsuddin and Idris (2019) have postulated that visualisation is one of the methods that could enhance creativity in teaching and learning. Choudhari, Gaidhane, Desai, Srivastava, Mishra and Zahiruddin (2021) described virtual mapping as a useful tool to break down complex information. They added that the virtual diagram simplifies the learning process and makes learning more interesting.

Even though numerous studies have been published on the approach used for effective online learning, the researchers discovered that there had been limited research on the importance of using computerised mind mapping as a learning tool among Office Management and Technology students in Malaysia. Since most educational sectors are now coping with the Covid-19 pandemic, creating a paper-based mind mapping seems impractical for students. Thus, computerised mind mapping is chosen as a helpful tool during this difficult period. Buzan (1989) indicated that computerised mind-mapping effectively stimulates the learner's whole-brain thinking. It emphasises spatial and visual language, which is generally inactive, stimulates the brain's right hemisphere, and encourages creative and logical cognitive environments. Subsequently, mind mapping has proven helpful for various purposes beyond simple note-taking (Brinkmann, 2003), and millions of people have used it for brainstorming, project planning, decision making, and document authoring.

Mind mapping, in this sense, can be a creative and alternative tool in the teaching and learning process that can suit digital-native learners due to its inherent nature. According to Buzan (1989), computerised mind mapping outperforms traditional paper techniques. Computerised mind mapping allows the learner to rearrange swiftly and move words and images, generate new ideas, and organise them logically. Furthermore, computerised mind mapping may quickly highlight distinct aspects of a complex mind map, including a feature that can bold or underline key information. Additionally, computerised mind mapping among university students will prepare them for their future careers, as in this digital age, it is inappropriate for them to submit their thoughts with a drawing of their plans. Abd Karim and Mustapha (2022) recently also contended that digital mind map provides various benefits not only for students, but also towards instructors, and professionals in today's digital world.

Organisations must innovate to meet tremendous competitive challenges; hence, whole-brain thinking has become more attractive. Market survival and expansion necessitate a steady supply of new and diverse products and services and enhance creation and delivery methods. Regardless of its proven effectiveness, many educators are unfamiliar with the mind mapping approach (Brinkman, 2003; Edwards & Cooper, 2010; Lu, Zou & Zhang, 2013 & Mueller, Johnston, Bligh & Wilkinson, 2002). Furthermore, due to a lack of exposure, educators may not employ this effective strategy in their teaching and learning (Edward & Cooper, 2010).

Due to the challenges above, this paper intends to conceptually examine the effectiveness of mind mapping as a learning strategy among Office and Management Technology students as it is part of the method used for their Personality Development course. Therefore, the objectives of this study are two-fold, which are to examine the importance of computerised mind mapping as a learning approach and to determine the effectiveness of computerised mind mapping among Office Management and Technology students.

2. Literature Review

2.1 The History of Mind Mapping

Mind mapping emerged from Ausubel's meaningful learning in 1978, which proposed that learning happens when learners integrate new concepts into existing conceptual and propositional frameworks (Ausubel, Noval & Hanesian, 1978). However, Mento Martinelli and Jones (1999) claimed that Tony Buzan invented mind mapping in 1978 to capture ideas and insights on a sheet of paper. Buzan (1978) indicated that mind mapping is a creative and performance approach that can assist individuals and organisations improve their learning and efficiency. Buzan trademarked the term "mind mapping" in 1990 and later introduced computerised mind mapping through mind mapping software.

According to Weinstein and Mayer (1986), mind mapping is the cognitive learning method because the learner wants to understand how received information is processed and organised into memory. Buzan (2000) and Howitt (2009) defined mind mapping as a visual tool that assists learners in generating ideas, taking notes, organising thoughts, and developing concepts. Finally, Jiang (2020) refers to mind mapping as a diagram that contains a visual representation of information. Mind mapping constantly organises knowledge since it employs a free-flowing strategy that encourages natural thinking.

Mind mapping has numerous advantages, specifically for educators. It can, for example, assist instructors in preparing and reviewing class lessons, making the learning session more exciting and diversified (Edwards & Coopers,

2010). Besides, mind mapping allows the learners to record and summarise the information on paper by integrating various concepts and ideas (Mento, Martinelli & Jones, 1999). Furthermore, the ability to think about the subject in a global, holistic way is aided by the visual presentation of concepts, promoting mental flexibility for the learners. However, the researchers agreed with the explanation of Buzan (1996) that mind mapping works as it includes the learner's radian thinking, which the human brain naturally and automatically functions. Furthermore, the mind mapping nature is associated with the mind's function, and it can be employed in practically any activity that involves cognition, remembering, planning, or creativity (Buzan, 1989).

2.2 The Mind Mapping Techniques

Mind mapping can be done in a variety of ways by students. For example, Margulies (1991) recommends starting the mind mapping with a central image and using keywords, colours, codes, and symbols to replace the traditional manner of taking notes in the workplace worldwide. The widespread availability and the use of mind mapping software have accentuated this tendency and will continue to do so. According to Buzan (1989), mind mapping involves seven principles, as shown in Table 1.1 below.

Table 1: Principles of Mind Mapping

	Principles of Mind Mapping
1.	Start from the center with a coloured image
2.	Use images throughout the mind mapping
3.	It is necessary to print the words
4.	All written words should be on separate lines, with each line connected to the next.
5.	The words should be organi**s**ed in "units" or one word per line.
6.	Use **colours** for the entire mind mapping
7.	The mind should be allowed to make as many associations and connections as possible

Source: Buzan (1989)

2.3 The Advantages of Mind Mapping on Student's Learning

There are many advantages that the students will gain when using mind mapping. Instead of being a helpful teaching and learning method, it can assist the students in learning more effectively. According to Nyagblormase et al. (2021), mind mapping can help students improve their listening and recording skills, boost their creative thinking skills, and efficiently address their problems. Astriani, Susilo, Suwono, and Lukiati (2020) indicated that mind mapping could help students improve their metacognitive skills by generating more meaningful associations with things. In addition, mind mapping assists students in better recalling the knowledge they learn during the lecture and increasing their ability to remember information effortlessly (Adodo, 2013).

Research has shown that mind mapping can assist learners in improving their writing strategy (Derbentseva, Sayeni & Canas, 2007; McGriff, 2007; Novak & Canas, 2006; Scarcella & Oxford, 1992). Mind mapping makes writing more meaningful by conveying thoughts and ideas through pictures and symbols. Spencer, Anderson, and Ellis (2013) emphasised that implementing mind mapping during the learning process can assist students in experiencing a creative and unique learning technique. In addition, Zhao (2003) stated that using a mind mapping strategy with students helps improve the delivery process by increasing their learning sense-making process.

Additionally, it has been discovered that mind mapping aids memory retention by allowing the learner to display all connected ideas on the same mind map, with emphasis and links indicated by images, symbols, and colours. Mind mapping is straightforward to understand, saving time and increasing productivity (Murley, 2007).

2.4 The Effectiveness of Mind Mapping on Student's Performance

Previous studies have shown that mind mapping significantly impacts student performance. For instance, Abi-El-Mona and Abd-El-Khalick (2008) discovered that mind mapping improves students' grades and boosts their ability to store the knowledge they acquire from their teachers' among Chemistry students. Furthermore, Saed and

Al-Omari (2014) discovered that mind mapping helps students enhance their writing skills in a study of eleventh-grade students in Jordan. According to the study, students who use mind mapping to organise and summarise material generate more ideas in their summary writing than those who do not utilise this strategy. In addition, Budiono, Degeng, Ardhana, and Suyitno (2016) discovered that using mind mapping significantly enhances student writing skills and performance among ninth-grade junior students in Indonesia.

When comparing students who used the mind mapping approach to students who utilised the traditional method, Astawa (2019) discovered that students who used the mind mapping approach performed better. Furthermore, consistent findings were found by Muchhal, Patthi, Singla, Gupta, Malhi, and Chaudhary (2018), indicating that mind mapping is one of the approaches and appealing teaching techniques that help students learn the subject more efficient and creatively as the substitution of standard teaching methods. In addition, a recent study by Nyagblormase et al. (2021) that compared the usage of mind mapping during online learning to physical learning discovered that mind mapping helped increase the students' performance. As a result, based on the evidence of the previous research, this study proposes to evaluate the potential influence of the mind mapping approach on improving student performance.

2.5 Integrative Mind Mapping Applications

The Office Management and Technology program students must undertake a Personality Development course in their first semester. The students were taught about mind mapping, and to determine their degree of understanding, the educators requested them to design their mind mapping based on the topic. Using the computerised mind mapping approach, students must summarise the thinking skill chapters on a one-page mind map.

Figure 1.1 below shows a sample of the individual integrative mind mapping application. The selected work produced by a student showed the ability to provide logical connections integrating common themes and concepts based on the understanding of the thinking skills chapter. This was the individual's first integrative mind mapping created by the student, and it was wonderfully done and produced beyond expectation.

Fig. 1 Student Developed Integrated Computerised Mind-Mapping of Thinking Skills Topic

3. Proposed Framework

Based on the literature, the following is the suggested framework for this study:

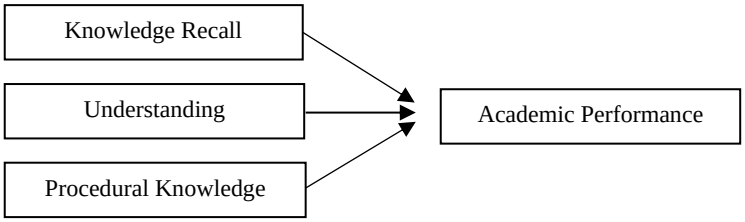

Figure 2: Proposed Framework (Adopted from Nyagblormase et al. 2021)

4. Methodology

Computerised mind mapping was chosen as an innovative method to teach Office Management and Technology students, specifically for the Personality Development course. Since mind mapping is one of the topics covered in the curriculum, semester one students enrolled in the Personality Development course will be chosen as the study's responses. By using a quantitative technique, the researchers will examine the impact of computerised mind mapping on student performance among Office Management and Technology students. The expected total population for this study is approximately 1317 students from six different campuses of Universiti Teknologi MARA offering the same program, including Melaka, Pahang, Kedah, Terengganu, Kelantan, and Sarawak.

The students will be selected using the stratified sampling technique, and the self-administered questionnaires will be distributed. The students will first be assigned to create a mind mapping for the topics covered in the Personality Development course. Then, the questionnaires will be distributed at the end of the semester after completing their assessments. The measurement items will consist of 18 items adapted from Nyagblormase et al. (2021) to investigate the effectiveness of mind mapping on student performance. Questions like "I understand the mind mapping learning strategy" and "Mind mapping is a relevant learning strategy" will be asked. These 18 items will represent knowledge recall, understanding and procedural knowledge as independent variables.

In answering the research question, the data to be collected will be analysed using Statistical Package for Social Sciences (SPSS) 26.0, and the descriptive and inferential statistics will be carried out. The frequencies, mean and standard deviation will be assessed during the descriptive test, while the inferential statistics will be conducted to perform the reliability test. Multiple regression will be used to measure the relationship between independent and dependent variables.

4. Discussion

Learning orientations vary amongst students in higher learning institutions. Some students are prone to be visual, some are auditory, and some are kinesthetic. However, based on a study conducted by Ramalingam (2014), the majority of learning orientation among Malaysian undergraduates is visual learners. On the other hand, visualisation has been suggested as a critical tool that can enhance creativity in teaching and learning (Khairani et al., 2019). Thus, the mind mapping approach is an efficient and creative technique that allows students to quickly produce innovative thinking for essays, assignments, and other projects.

As previously stated, the purpose of this study is two folds. First, this study is conducted to investigate the significance of mind mapping as a learning strategy and second, to determine the effectiveness of computerised mind mapping among Office Management and Technology students. As a result, it is anticipated that this research will assist students, particularly those in Office Management and Technology programs, in developing a successful learning plan during the Covid-19 pandemic. Based on previous research, this study anticipates that the use of computerised mind mapping will improve students' performance. In addition, it may make online learning more enjoyable while assisting students in understanding, enjoying, and improving their academic performance. Previous studies also have proven that the mind mapping approach provided a creative and innovative strategy as it encouraged learners to participate and improve their academic performance.

Hillar (2012) agrees that mind mapping is a valuable platform for instructing students. For example, when introducing a new topic to students, mind mapping is a conceptual method that aids in communicating information. Furthermore, when examining the differences between computerised mind mapping students and those who did not, Al-Jarf (2009) discovered that mind mapping could help students brainstorm, develop new ideas, and connect distinct topics. Students who did not employ mind mapping, on the other hand, struggled with spreading concepts in writing paragraphs. Consistent with the findings of Riswanto and Putra (2012), who conducted a study among first-year students and discovered that employing mind mapping can help improve students' writing achievement while teaching the mind mapping approach.

5. Implications

In today's educational practice, practical teaching approaches for stimulating text-based learning are required (Alexander & Res, 2012; Schlag & Ploetzner, 2011). This study focuses on the instructional use of mind maps, which are currently widely utilised in classrooms. The potential outcomes to be produced by this study could have several significant implications for educational practice and research. First, the researchers believe that by conducting this research, more insight and knowledge on how to improve teaching and learning methodologies for all educators dealing with the COVID-19 pandemic. However, based on the review of the past studies, it is found that most of the studies on mind mapping usage have been conducted in the Western countries, and limited research is to be conducted in looking at the effectiveness of mind mapping on student performance in Asian perspective. The researchers believe that by using mind mapping, the student can enhance and integrate work from several books and publications into a single, comprehensible, understandable set of thinking. In fact, a recent study on the application of mind mapping as a learning tool by Vaddatti, Chaitra, Kiran, Renuka, Laxmi and Potti (2022) among 112 MBBS students revealed that the knowledge obtained and retrieval of information were higher than conventional learning.

As learners only have one page to express the content of an article or book chapter, they must be efficient and attentive in selecting the most relevant thoughts and ideas for comprehension and memorisation. Besides, the purpose of this study is to encourage educators to incorporate the computerised mind mapping approach into their current teaching styles to make the lesson more exciting. They are encouraged to use worked-out mind maps with escalating levels of difficulty, complemented by student activities that simulate authentic learning scenarios, in consultation with mind mapping and subject matter experts.

6. Conclusion

In conclusion, the researchers believed that mind mapping brings a renewed sense of delight to the classroom because it increases the learner's notion of skill in grasping the assigned topic. In addition, digital-savvy students are expected to use more digital media devices in their learning sessions, and these devices should be smoothly integrated into their classroom experiences. In fact, by using computerised mind mapping increases a learner's intrinsic motivation, making them appreciate the learning process because students have exciting and engaging experiences. Being only a conceptual paper, this research suggests that a more comprehensive study should be initiated in the future to confirm further the arguments and claims that have been postulated. It is acknowledged that whether the students are visual, auditory, or kinesthetic learners, their learning styles may increase their performance and make learning more engaging and fun. Thus, computerised mind mapping is a tool that could help them become more effective and engaging learners.

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8. About the author

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