

Application of Digital Mind Mapping (MINDOMO) in Improving Weak Students' Narrative Writing Performance

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Abstract

The English language is a widely used communicative language worldwide as more people take up English as Second Language (ESL). English is taught in Malaysia from the primary level until the tertiary level. However, written communicative competence among students is still low as students could not develop, organise and structure their written paragraphs appropriately. In line with these, this study aims to investigate if there is a significant difference in students' narrative writing performances after implementing the mind map technique. A total of 16 students were selected as research samples through purposive sampling. The instruments used in this study are pre-test scores, post-test scores and semi-structured interviews. It uses descriptive analysis and statistical analysis of pre-test and post-test scores using SPSS and semi-structured interviews, which were thematically analysed as evidence. The findings revealed that there was a significant difference in the pre-test score ($M = 8.19$, $SD = 2.562$) and post-test scores (13.81 , $SD = 3.124$) given the conditions; $t(15) = -9.893$, $p = 0.005$ which proves that students' narrative writing performance does show improvement after comparing both the pre-test and post-test scores using SPSS. Overall, the findings reflect a positive result.

Keywords

English as Second Language (ESL), Mind Map, Narrative Writing, Writing Performance, Writing Skills

1. Introduction

The English language, commonly referred to as the lingua franca, is a universal

language for people whose native or first language is not the same. It is spoken throughout the world, and it is taught as either English as Foreign Language (EFL) or English as Second Language (ESL). Sani & Ismail (2021) concluded that English is still relevant as a lingua franca students are expected to learn to survive the demands and the challenges of 21st-century education. Students in Malaysia learn English as a second language beginning from primary education until tertiary education. Dass et al. (2021) clarified that this is a status the English language has held since gaining independence. To further improve the quality of English among learners, the Education Ministry introduced the Common European Framework, where the first batch of pupils involved in the implementation of CEFR sat for their Sijil Pelajaran Malaysia (SPM) in the year 2022/2023. The Common European Framework (CEFR) consists of five components which are 1) language awareness-grammar, 2) listening skills, 3) reading skills, 4) writing skills and 5) speaking skills. The aim of this framework is to provide a more constructive assessment, language learning and teaching. It is crucial to encourage, promote and support the efforts of learners and educators who are constantly developing their teaching and learning based on their needs, motivations and characteristics, with the resources available around them (Council of Europe, 2001).

Writing skills is a skill that students do not prefer. Yunus et al. (2019) mentioned that writing skill is the most minor favourite skill in the English language as they classified it as complicating, demanding and wasting time. In order to help students to achieve their full linguistic potential, it is vital to identify the writing problems. This will eventually help students convey their intended message effectively to the audience. Yulianti (2018) listed the lack of vocabulary, lack of understanding of the grammar rules and the lack of confidence as the factors that cause writing difficulties. Pablo and Lasaten (2018) observed that the most evident problems in writing are the lack of ideas, usage of wrong words, poor sentence structures and absence of connectives. Habibi et al. (2017) also said that choice of words, organisation of ideas or sequencing and grammatical errors are the most prominent problems in learning writing among tertiary learners. These problems are a common problem faced by many English language teachers in Malaysia. Yunus and Chien (2016) mentioned that students were hesitating and were looking worried as they tried to write, thus, resulting in their points being unorganised. They further added that despite the students having ideas to write, they are not able to convey and transform the ideas into a well-written piece of text with proper continuity, delivery and language. These problems occur mainly because of the lack of practice among the students. Based on these data, we can categorise the writing problems into a few groups like the development of content, poor language use and self-belief. Thus it can be concluded that most writing problems occur during the process and practice stage and psychological elements like anxiety and motivation often accompany them.

Hence, to overcome these identified problems, the researcher chose the narrative writing type as it is relatively easier to accomplish than a more factual type

of writing. [Namasivayam et al. \(2017\)](#) remark that writing is the most challenging skill to master because it challenges the cognitive system. Students need to construct sentences and paragraphs and simultaneously think critically to generate ideas. She further adds that writing is an indirect skill that does not require direct communication or face-to-face interaction. The thought process enables ideas, concepts, and feelings to be presented in written form. There are various genres or types of writing that can be introduced to students. However, in this study, the main focus will be on narrative writing. In simple words, narrative writing could be identified as storytelling in written form. [Bruner \(1991\)](#) presented that narrative writing is a recollection or interpretation of life experiences in an organised manner, whether it is an actual event or a fictional event.

Strategies and techniques were devised to teach narrative writing to the students successfully. [Yunus et al. \(2018\)](#) listed free writing, brainstorming, questioning, listing, clustering and mapping as pre-writing strategies. Mind maps are generally used as a pre-writing strategy for generating and expanding ideas when writing an essay. The researcher chose the mind map technique to help students produce a more organised and detailed essay because it provides a basic outline before students start to write. These maps were created and believed to aid in organising ideas in a systematic manner and promote thinking skills. [Tee et al. \(2014\)](#) explained that mind maps help students think, integrate new information and develop a conceptual schema. It facilitates learning by enhancing creativity and makes learning easier. This can be supported by [Borkar \(2011\)](#) that the mind map technique can be used for information retention and optimising brain power. Not only that, but it also promotes critical thinking that leads to permanent learning and strengthens students' idea development ([Keles, 2012](#); [Saed & Ali Al-Omari, 2014](#)).

It is commonly known that mind maps are generally done using paper and pen or a whiteboard, depending on the teaching environment. However, due to the ever-changing nature of the educational scene, more emphasis is being paid to incorporating digital settings in teaching and learning. [Pazilah et al. \(2019\)](#) state that using technology during lessons has become significant, and it provides room for improvement in the aspect of language learning. Therefore, given that students are continuing their education from home due to the Covid-19 pandemic, it is a perfect opportunity to introduce a more digitalised mind mapping technique. [Yunus \(2018\)](#) mentioned that the usage of technological tools in the field of Teaching English as a Second Language (TESL) is not something new. According to [Aydogdu and Guyer \(2019\)](#), these computerised mind maps are used for various functions, including communication, entertainment, learning and reading. Besides the traditional mind mapping functions, [Chang et al. \(2018\)](#) explained that digital mind mapping allows students to complete and record information related to their studies and simultaneously promotes the integrity of their knowledge. It helps students generate ideas effectively using the stimulus they have prepared to convey the concepts in a fun and operative way.

However, teaching writing skills during the pandemic was challenging and required extra effort. It was seemingly repetitive and was not helping students on the whole as they were from different proficiencies. Lukas and Yunus (2021) elaborated that moderating writing online was difficult since students had different and contrasting interests and learning styles. Thus, in this study, the MINDOMO was chosen as a learning tool to assist students with their narrative writing in the pre-writing stage to provide a more personalised setting for their learning. MINDOMO is a software application used for digital mind-mapping used to improve productivity, develop ideas, and boost learning effectiveness. It promotes collaborative concept mapping, mind mapping and outlining. In short, the mind mapping technique is a fun, simple and effective way to plan, draft and produce ideas.

Therefore, to improve students' writing performance using the mind map technique, this study aims to

- 1) Investigate if there is a significant difference in students' narrative writing performances after implementing the mind map technique and
- 2) Examine if there is a significant effect on students' narrative writing performances after implementing the mind map technique.

2. Methodology

1) Research design

This research is a mixed-method study. The research was divided into two parts, and the researcher collected the data within two months. The first part was the pre-test, treatment and post-test. In comparison, the second part was the semi-structured interview. This study attempts to identify the effectiveness of using the mind mapping technique and its effect on ESL learners (Figure 1).

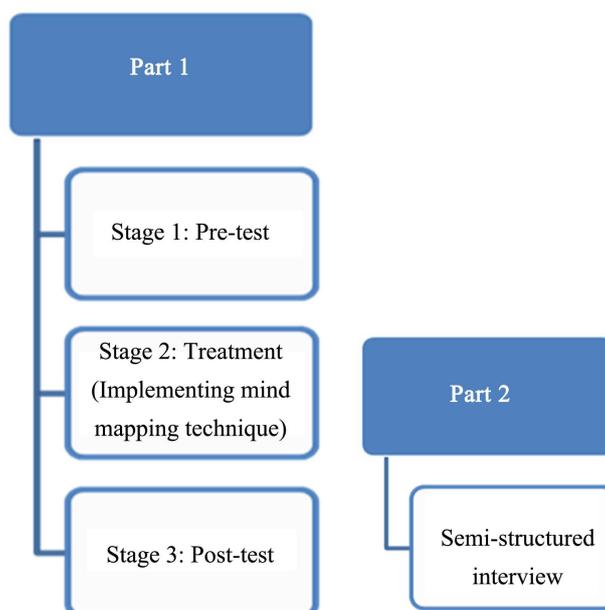


Figure 1. Research design.

2) Sample and data collection

The participants in this research are 16 mixed-ability Form 4 English as Second Language (ESL) learners in a rural school in Labis, Johor. The participants were chosen through purposive sampling. The instruments used in this research are the pre-test scores, post-test scores and semi-structured interviews. The researcher carried out each session for 50 minutes within the span of 8 weeks. After completing the 8-week cycle, eight students from the intermediate, lower intermediate and poor categories were selected to participate in the interview.

3) Analysing of data

The quantitative data collected from the pre-test and post-test (scores) were compared and analysed using descriptive statistics and statistical analysis using SPSS. Students were tested on the same question for pre-test and post-test. The scores were obtained using the rubrics by Brown (2003). The qualitative data gathered from the grouped semi-structured interview were thematically analysed. The data was gathered and grouped by codes and themes. According to the students' opinions, samples related to the theme were provided to allow a better comprehension.

3. Findings and Discussion

Table 1 reports the pre-test scores, post-test scores and the difference in scores based on the test of all 16 students involved in the study in a rural school in Labis, Johor. All the students have been given pseudo names. However, the pseudo names are given according to their respective gender and race.

Table 2 shows the students' pre-test scores, post-test scores and the difference between pre-test and post-test. The pre-test was given in the first meeting before introducing any treatment. There were 16 candidates in total. The lowest score was six, while the highest score was 15. The median score was 7.5, and the mean score of the pre-test was 8.19, while the standard deviation was 2.562.

On the other hand, the data gathered from the post-test shows the scores which were obtained after the mind mapping technique was introduced to the students involved in the study. The post-test was given during the last meeting after treatment had been introduced. The lowest score is six, while the highest score is 18. The mean score is 13.81, the standard deviation is 3.124, and the median score is 14.5.

Based on the pre-test and post-test data, we can see the difference in scores between the pre-test and the post-test results. The lowest gained score is 0, while the highest gained score is 9, which signifies that while there is a particular student who showed no improvement at all in the score, there was also a student with an impressive improvement. Meanwhile, the difference between the mean score is 5.62, and the difference in standard deviation is 0.562.

From **Table 3**, we know that the mean of both tests is significantly different, where the mean of the pre-test is 8.19, and the mean of the post-test is 13.81.

Table 1. The students' pre-test score, post-test score and score difference.

STUDENTS	PRE-TEST (n/20)	POST-TEST (n/20)	SCORE DIFFERENCE
Tan Tai Hao	11	17	6
Wong Ye En	12	18	4
Khoo Boon Ping	15	18	3
Koh Wee Hong	9	15	6
Siti Aisyah	8	14	6
Hasya Hilfina	6	12	6
Nurul Akma	6	12	6
Tan Mei Zi	6	11	5
Lee May Yan	7	13	6
Muhd Fitri	8	15	7
Muhd Haikal	9	15	6
Siew Hui Yang	7	16	9
Patrick Twan	7	15	8
They Shun Yi	6	14	8
Tan Lee Ling	8	10	2
Thim Wei Cong	6	6	0
Total	135	221	86

Table 2. Summary of distribution statistics of pre-test and post-test.

	Pre-test	Post-test	Gain
N	16	16	-
Mean	8.19	13.81	5.62
Standard deviation	2.562	3.124	0.562
Minimum	6	6	0
Maximum	15	18	9
Median	7.5	14.5	6

Table 3. The t-test of the pre-test and post-test.

	Pre-test	Post-test
Mean	8.19	13.81
N	16	16
Standard deviation	2.562	3.124
Standard error mean	0.640	0.0781

Besides, the standard deviation from both groups is also different. The standard deviation of the pre-test is 2.562, while the standard deviation of the post-test is 3.124.

Table 4 is a paired-samples t-test to compare the pre-test and post-test scores of students involved in the research. It can be observed that the mean is -5.625 , the standard error mean is 0.569 , and the standard deviation is 2.277 . The upper limit is -4.412 , while the lower limit is -6.838 .

There was significant difference in the pre-test score ($M = 8.19$, $SD = 2.562$) and post-test scores (13.81 , $SD = 3.124$) conditions; $t(15) = -9.893$, $p = 0.005$. These results suggest that students' narrative writing does show improvement if both the pre-test and post-test scores were compared. Therefore, we can conclude that there is a significant difference in students' writing performance after implementing the mind mapping technique was introduced to the mixed ability Form 4 students.

Data obtained from the interview with the students will answer the second objective and are presented in the form of tables.

As seen in **Table 5**, the benefits of using a mind map listed by the students are grouped under two principal codes: remember and plan. As suggested, under the code of "remember", the identified themes were using mind maps to remember ideas and reinforce what they have previously learned. Next, based on the code of "plan", themes found were that it helps them divide points accordingly, come up with relevant ideas, find a connection between ideas, and spend their time preparing and writing wisely.

Hofland (2007) stated that mind mapping provides L2 learners with a meaningful repetition and retention of new words. Graphics and pictures in mind maps allow more vivid memory retention and motivation for learners (Liu et al., 2014). Reflecting on these statements, they will be able to remember what they have learned better. Based on the grouped interview, we know that students believe it helps them with memory retention and reinforcement of previous knowledge. Heidari and Karimi (2015) revealed that students could store vocabulary in their long term memory for a more extended period because the mind maps have a mnemonic role in vocabulary learning. They also added that mind maps are easy to review, and thus, regular reviewing reinforces learners' memory. In short, it is clear that using the mind map technique helps reinforce what they have previously learnt and helps them with memory retention of vocabulary and ideas.

Table 4. Pair sample t-test.

Paired Samples Test							
	Mean	Standard deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	Sig. (2-tailed)
				Lower	Upper		
Pre-test-Post-test	-5.625	2.277	0.569	-6.838	-4.412	-9.893	15 0.005

Table 5. The analysis of the answers students gave to the question “From your observation, what are the benefits of using the mind mapping technique?”.

Codes	Themes	Sample Expressions
remember	Memory retention	“using the mind map can help me to remember better (idea & vocabulary)”
	Reinforce what was learned	“the mind map is repetitive because it is like notes, so what we learn before this we can always recall easier”
plan	Divide the points accordingly	“the branches help to divide the points and supporting details”
	Relevant ideas	“we won’t mix up ideas because the branch is very clear, so we won’t write clumsily”
	Connect the ideas	“when I do the mind map it helps to understand the connection between one idea and the other” “it become very fast to write the essay”
	Spend time wisely	“when all points are ready and arranged, I won’t stop to think when I’m writing the essay”

On the other hand, the role of the mind map in aiding in organising ideas is widely discussed. The mind mapping technique is an innovative technique that facilitates the generation of ideas quickly. It outlines a short summary or draws a connection between points. Before students start writing, they would prepare their points and ideas to make writing easier. Students have mentioned that the mind mapping technique helps them draw relevant points and allows them to divide points accordingly. Students also will not mix up ideas because the branch is apparent, and they can write with clarity and precision. This shows that the mind mapping technique helps with the organisation of ideas to plan their narrative essay writing. This relates to [Stankovic et al. \(2011\)](#), who explained that mind mapping is a simple brainstorming method that uses the map as a central portal to connect vital information. [Vijayavalsalan \(2016\)](#) proved that the mind mapping technique as a pre-writing tool improves the quality of an essay and helps to understand as there is a better focus on ideas which are written according to the learners’ own words and understanding. When students are able to make connections and associations on their own using the mind mapping technique, they will be able to produce better-written essays as this allows students to strengthen their thinking and write a well organised and thorough story ([Saed & Al-Omari, 2014](#); [Yunus & Chien, 2016](#); [Abubakar et al., 2021](#)).

[Khoiriyah et al. \(2021\)](#) agreed that mind mapping saves time by mentioning that students are required to think logically to control their time. [Krishnan et al. \(2021\)](#) reiterated that mind maps save time by stating that mind maps are shortcuts which aid in remembering something and save time, especially when the user is dealing with a large concept and working against the clock. This is very true in the sense of students having to create narrative essays within a short

amount of time during examination when the entire writing paper for Sijil Pelajaran Malaysia (SPM) tests them on three separate parts of essays. To sum up, it is clear that mind mapping allows students to plan their ideas, and they know how to sort their ideas, list relevant ideas, connect the ideas and not waste time during the writing process

Based on **Table 6**, the difference noticed by the students when using the mind map technique can be grouped into two themes which are cognitive, affective and time. For “cognitive”, the sub-themes were a clear and precise writing style, easier to write an essay, and they can write a better storyline. Apart from the difference in the essay, the sub-theme of “affective” is felt happy and motivated to write after using this technique.

The mind map is seen as a visualisation tool which facilitates more meaningful learning. It is mainly used to show students logical thinking ability and cognitive scheme development. *Ningrum and Ahmad Yani (2021)* elaborated that mind maps can also be used to record students’ thought processes to know how they interpret new information they have received. They further explained that mind maps offer a systematic analysis and maximise cognitive function among learners. This is in line with *Al-Jarf (2021)*, who concluded that the mind mapping technique highly effectively increases cognitive processing and develops a more structured idea in a written text.

Next, before students start writing their essays, it is crucial to have an outline. Through mind maps, they can make learning more meaningful. *Nurlaila (2013)* proposed that the mind mapping technique can stimulate the mind and provides ideas as an outline for students to refer to when they begin writing. *Al-Zyoud et al. (2017)* stated that the mind mapping strategy is an innovative strategy that enables students to generate better ideas to produce good written texts. They also stated that the hierarchical structure helped students to link ideas better and produce a more connected essay. This shows that the mind mapping technique is superior in producing a skilled and organised thought process which is later transferred into a written text. Next, a student also mentioned that they think critically about the implementation of the mind mapping technique.

Table 6. The analysis of the question “What is the difference noticed when using the mind mapping technique?”.

Codes	Themes	Sample responses
Cognitive	Precise writing style	“I can write the essay orderly and to write good essay”
	Easier to write the essay	“The points make write essay easier”
	Write better storyline	“The points are arranged clearly, so I can write a clear storyline”
	Critical thinking	“I think critical thinking because I must draft idea, then later I can write the story”
Affective	Feel happy and motivated	“I feel relaxed because of the systematic technique”

Additionally, the mind mapping technique provides a way for students to connect two dots easier. Vijayavalsalan (2016) clarified that it provides a better understanding of a topic and observes a connection between the ideas. Essentially, students have a hard time to develop ideas. By using the mind map, students are forced to think critically about how they would like to expend their ideas in a more logical manner. Sari (2020) reveals that students think actively while creating the mind map. Thus, they train to seek knowledge on their own.

Additionally, besides the cognitive aspect, students also mentioned the improvement in the affective aspect. They mentioned that they felt happy and motivated when they were using the mind mapping technique. This shows that when students have a certain amount of guide to start with their writing, they can feel better about themselves. According to Nazril et al. in Novianti and Kareviati (2021) the mind map technique not only improves students' writing achievement, but it is also able to motivate students to write better because it is a great pre-writing tool. It is further discussed that the mind map technique using motivates and facilitates students in making concepts in writing. Brainstorming activities motivate students who do not usually want to write by creating a non-threatening atmosphere (Scane, 1991). Listyani and Tananuraksakul (2019) discussed that negative emotions like lower confidence and anxiety act strongly as a barrier and hindrance when processing the input and in general students' productive performance. Jones et al. (2012) claimed that a high majority of students were content using the mind maps because they believed that they learned from it and could see their progress. In short, when students are not stressed about the outcome and are happy with their learning atmosphere, they feel more motivated to learn and are satisfied with their learning outcome. To sum up, two themes were identified: cognitive aspect and affective aspect.

Based on the findings above, it is evident that students are satisfied with their experience of using the mind mapping technique. This is because students gave a more positive response towards to implementation of the mind mapping technique to write a narrative essay. Through the positive responses gather from the students, we can gauge that the implementation of mind mapping technique is favoured by students. These findings also reflect the results that the researcher would have hoped for. So, we can conclude that the implementation of the mind mapping technique to improve narrative writing performance was flourishing and had a significant effect on students' written essays. The findings also show that the mind mapping technique is significant in engaging students to prepare a well-structured narrative essay.

4. Conclusion

Using the mind mapping technique to teach narrative writing among mixed-ability Form 4 students shows more positive results than when mind maps were not used. Based on the tabulation of data and statistical analysis carried out by using SPSS, it was found that there was a significant difference in the pre-test score (M

= 8.19, SD = 2.562) and post-test scores (13.81, SD = 3.124) given the conditions; $t(15) = -9.893, p = 0.005$. Looking closely at these results, it proves that students' narrative writing performance does show improvement after comparing both the pre-test and post-test scores using SPSS. According to the interview, students had various positive opinions regarding the implementation of the mind mapping technique. Hence, mind mapping is helpful in improving the quality of students' narrative writing performance.

5. Recommendations

The findings in this study reflect that students have a positive response to the implementation of the mind mapping technique. Despite this method being favoured by the students, teachers or future researchers could improve this mind mapping technique by introducing the element of technology in this study. Although the researcher carried out the lessons via Google meet, the researcher personally did not have a satisfactory experience. To overcome this problem, the researcher suggests that future researchers include social media like Facebook or Twitter as one media where students can participate more actively and freely without too much pressure or being afraid that they could be wrong. This is because social media is a more relaxed environment, unlike Google meet, which is a more official setting. The researcher could ask students to share their completed tasks online, where peers and classmates could give their feedback on aspects that could be improved to create more meaningful learning for students. It would reflect on the 21st-century learning agenda, which the government has always promoted. The researcher could create a private Facebook group where all the students could join and control the interactions that happen in the group. This will not only open avenues for research on students' cognition process involved in learning when the mind mapping technique was introduced, but the researcher could also learn more about the affective domain of learning like motivation, learning anxiety, enthusiasms, attitudes towards learning and values adopted during learning. However, it should be noted that the success rate of this will be higher in an urban school as compared to a rural school.

6. Limitations

This study focuses on the students' narrative writing ability in terms of content development, organisation and structuring of ideas, language use, vocabulary and mechanics of written language like capitalisation, spelling and punctuation. In order to ensure that students have enough practice and understanding of the technique, three rounds of exercises were done before the post-test was carried out. However, due to the nature of the online lesson during the COVID-19 pandemic, the chances of real-time feedback were limited. Feedback will be provided after students submit their written essays. Thus, it limits students' and teachers' interactions.

Other than that, the limitation while conducting this research will be students'

overall attendance. Most of the students in the particular school are students from underprivileged backgrounds. This means not all students have their own mobile phones or a gadget to attend online classes. There are also students who have to share their gadgets with their siblings, and consequently, they will not be able to attend online classes. In short, these are the limitations of the research.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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