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Technology-Assisted Mind Mapping Technique in Writing Classrooms: An Innovative Approach

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Abstract

In language acquisition research, four important language skills form complete communication components consisting of listening, speaking, reading and writing. To aid in the acquisition of these core language skills, mind maps can be used in a multitude of ways, for instance to generate, to visualize, to structure and also to organize ideas. Other than these, mind mapping techniques can be employed to study and collect new information, to solve difficulties, to make decisions and finally to write purposefully. The present study was carried out to investigate the multipronged approach that can be adopted to inspire and support students who want to use mind mapping techniques in their English language writing classrooms. In this paper, we review previous work in this area and highlight present studies that explore the implementation of technology-assisted mind mapping techniques in the pre-writing stage. The results of the study reported in this paper indicate that attitudes of writing students became significantly more positive toward the adoption of technology-assisted mind mapping techniques. This is particularly true with reference to their pre-writing activities, in order to enhance their writing skills in ESL (English as a Second Language) classrooms in the Malaysian education context.

Keywords: Online Mind Mapping; Technique; Writing; Students' Attitudes

Introduction

Writing is a very significant core language skill, due to the fact that it is also related to academic prowess. According to Heaton (1988), writing skills are oftentimes quite challenging to teach because this language skill needs mastery of theoretical and critical elements. In addition, Flower & Hayes (1980) argue that writing is an intricate and imaginative process that is crucial for productive communicative practice. For Hadley (1993), writing refers to a range of different activities, for instance, composing in the form of narratives and converting raw data into new text. Thus, writing is best regarded as both artistic and mechanical (Adnan, 2014), whereby features of writing on one end will lead to more complex outcomes on the other (Abdullah, Rahman & Adnan, 2012).

For Flower and Hayes (1981), writing in English as a second language is equally difficult, especially for younger learners of a new language (see Adnan, 2006). This is due to the fact that younger children and novice writers will face writing-related psycholinguistics problems such as competing attention demands on ESL as opposed to their mother tongues, deciding on content that is appropriate to a writing topic, selecting suitable words and precise grammar to form comprehensible sentences, organizing each sentence into a longer paragraph and finally making sure that paragraphs flow together into an essay. Furthermore, beyond the page, writing students need to be aware of suitable organizational patterns and they must also consider the writing purpose and intended audience, once the writing product is finished (see Ab Manan, Zamari, Pillay, Adnan, Yusof & Raslee, 2017). These difficulties create extra burden that might overwhelm the inadequate capacity of short-term memory, especially in children (Ilias & Adnan, 2012) and lead to marked variances between the writing process and the written products of novice writers and expert writers (Flower & Hayes, 1981). Richards' (2002) work lend support to the above, in that writing is perceived as one of the most difficult skills for second language learners to learn, what more to master within the Malaysian Communicative Language Teaching syllabus (see Adnan & Abdullah, 2012; Ilias & Adnan, 2015).

Within the Malaysian English Language curriculum, students still cannot avoid from learning to write and to master this essential academic skill that will carry over from preschool level to primary to secondary, higher education and beyond (Ministry of Education Malaysia, 2000). Problematically, despite having learned the English Language for a number of years, many Malaysian students remain weak in this international language, particularly in their writing skills (Adnan, Ramalingam, Ilias & Mt Tahir, 2014). Chitravelu, Sithamparam and Teh (2005) suggest that writing is the skill that most Malaysian students are weak in because they do not know how to accomplish their written tasks satisfactorily. In Malaysian English classrooms, teachers play an important part in guiding their students to come out with quality ideas that can be used to practice both their speaking and also writing skills (Adnan & Abdullah, 2014).

There are many different ways in which local teachers can guarantee that their English students will come up with ideas that are sound and acceptable (Ilias & Adnan, 2016); sadly the 'Malaysian English language dilemma' continues until today, even more so for the majority Malay-Muslim population who are overly protective of Malay as their mother tongue (see Adnan, 2005, 2013, 2017a, 2017b, to understand this sociolinguistics phenomenon). Back to the present day, due to the extensiveness of technology, writing in ESL classrooms continue to be critical to future academic success, due to the fact that writing is a basic productive skill, apart from the skill of speaking. As such, mind mapping and concept mapping have both been successfully employed as a pre-writing approach in other educational contexts. However, within Malaysian borders, research in this field is still few and far between, with more researchers interested in social networking platforms vis-à-vis classroom learning (Zamari & Adnan, 2011).

The Mind Mapping Technique

Mind Mapping

There are many different ways to label 'mind maps'. Mind maps as the general category can sometimes be referred to as concept or cognitive maps, knowledge or semantic mapping, think links or even graphic organizers (Svantesson, 1989). According to Buzan (1993), mind maps are employed to visually and to graphically depict associations between ideas or concepts. Buzan's

mind mapping technique is also seen by many as the most effective form of visual note-taking strategy. He also suggests a spatial, non-linear approach to note-taking. This is due to the fact that it taps a person's natural ability to think and imagine in an integrated, interlinked and complex manner. Mind maps feature tree-like branches of information that display important concepts as well as their relationships. However, mind maps are more global in the approach compared to linear concept maps (Adnan & Ilias, 2012). Students can quickly create a 'big picture' of their topics, and mind maps can help in organizing and remembering written spoken data, preparing to write essays, planning and assessing projects and events, or making a pictorial record of a meeting in progress. Both students and teachers will find this strategy useful for teaching and learning. In mind mapping, there is also an emphasis on colours and graphics as a way to make information more memorable. As the main proponent of mind maps, Buzan strongly suggests that mind mapping has immensely greater benefits compared to old-fashioned note-taking approaches.

Indeed, mind mapping is a great tool to help students to face day-to-day problems with the organization of their ideas and points of view (McGriff, 2007). McGriff (2007) adds that mind maps are an excellent way "to help learners organize knowledge, to empower themselves to better comprehend key concepts and principles in lectures, readings, or other instructional materials". He strongly believes that connecting pictures to concepts is a creative task which requires overt thinking instead of merely memorizing information.

Mind Mapping in Planning the Process of Writing

Planning a piece of writing before the transcription process begins would appear to be a supportive strategy and research shows that expert writers differ from novice writers in the amount of time spent during the planning stage. Scardamalia and Bereiter (1985) found that children under nine years of age made list-like plans, which they then transferred into a slightly fuller written piece of text with some revision or reorganization.

Mind mapping starts with writing down a key notion and then producing novel, related ideas from the central point. As such, this thinking strategy can effectively be employed to discover many different topics in the writing classroom and it can also be used in every genre of writing such as narratives, descriptive accounts, recounting memories, persuasive and also argumentative texts (Riswanto & Prandika, 2012). Adam and Mowers (2007) suggest that students who could express the learning process with the aid of graphical representations had a 40% higher retention rate compared to 'traditional' verbal learners. Their research data suggest that using mind maps in writing classes is not only a useful way to help plan the writing process, but it is also a productive way to continue to support learners as they continue their writing tasks fruitfully.

On the contrary, even with the abundance of research data that suggest the benefits of using mind mapping, this technique is considered by some researchers as not a very useful skill to learn and to adopt. For instance, it could take such a long time for the teacher of writing to present this technique and far longer for the students to grasp its intricacies, even more so if the students are weak writers or they are not very creative (see Buzan, 1993). This scenario may be true when using mind maps in an examination scenario, especially if the students are not very familiar with the concept of mind mapping from the outset. For that reason, teachers must give

their students plenty of chances to rehearse this thinking and planning scheme before examinations start so that they can use it in more effectively in the long run.

With reference to the skill of writing, a study by Padang and Gurning (2014) on enhancing the ability of students in constructing descriptive written texts through mind mapping showed that this thinking and planning technique to organise our thoughts could actually increase students' achievement in writing; mind maps can also help teachers in their writing lessons more productively. The improvements noted by the two researchers were not only observed in the increment of the mean of the students' test scores, but they also noted a rise in students' enthusiasm and drive in the skill of writing. For Warsidi and Arafah (2013), students' writing abilities can really be enhanced through the combination of mind mapping techniques and advanced organizational patterns. In the long run, the contents of written products will benefit through more rigorous organization, larger vocabulary and more complex language use. Therefore, the combination between mind mapping techniques and advanced organizational patterns *can* develop students' positive attitudes in future, as they become more driven to plan and to come out with their own written products.

Advantages of Mind Mapping in the Process of Writing

As the preceding section has highlighted, there are several productive reasons for the teaching and learning of mind maps in the process of writing in a second or foreign language. For Zaid (1995), mind mapping is very useful in the process of outlining an essay on any given topics or in the process of helping students to start writing actual paragraphs. In addition, Mercer (2002) believes that mind mapping aids students in the process of making connections amongst ideas and in linking known information with previously unknown information. In this sense, mind mapping will be useful before the process of writing, during writing and also post-writing. This researcher also observed how mind mapping can aid novice writers to focus on the given topic by having their ideas explicitly seen in front of them as they start the writing process. Complete mind maps also help novice writers to write in correct and logical order. Consequently, mind mapping can be viewed as a mental tool that can guide writing students through four stages of the writing process, namely the prewriting stage, drafting stage, editing stage, and finally the revising stage. Most notably, mind mapping techniques can support and encourage a nonlinear style of thinking. By creating mind maps, writing students can move around in their minds and follow their personal interests in an organized yet non-constricting framework.

In a research conducted by Yunus (2016), 92% of writing students generally provide positive responses to the use of mind mapping in their MUET (i.e., Malaysian University English Test) writing paper. These students strongly believe that mind mapping can assist them in the process of writing English essays. Indeed, mind mapping techniques lend support to their writing by assisting them in organizing initial ideas before they even start writing, creating novel ideas in their writing products with suitable and relevant examples, and also allowing them to list key points so that they can elaborate these easily in the actual writing product. Without a doubt, mind mapping techniques are effective tools to help students to plan and to organize their writing products whilst simultaneously encouraging them to gain in-depth understanding of the things that they write about.

The above ideas find support in the work of both Keles (2012) and Bharambe (2012). From providing an avenue for visually stimulating ideas to be created to illustrating logical sequences

of events – past and future, and from helping writing students to effectively organize their thoughts to allowing them to present these ideas beautifully and coherently, modern mind mapping techniques are perhaps the next most important invention since human beings learned how to write in the first instance.

Mind Mapping using Technology

Mind mapping is an operational and simple way of using diagrams to show information. It is also a great tool for brainstorming (Zamari, Adnan, Idris & Yusof, 2012). It helps the writing process especially in the pre-writing stages. Conventionally, mind maps were drawn with coloured pens and paper. With presently available technology, it is possible to create mind maps by using computers, which make them easy to style, review, revise and save. Online mind mapping is a useful way to excite students' interests and teach intricate or multi-layered topics. This technique can help learners to see the interconnections between characters in a literary work, to understand factors that change the global economy, and to tease the possible effects of climate changes on our lives (Adnan, Ilias, Ramalingam & Mt Tahir, 2012; Adnan, Ramalingam, Ilias & Mt Tahir, 2012). There are many mind mapping software and mind map application tools that teachers and course instructors can use such as Free Mind, Mindmeister, MindMapple, Bubbl.us, NovaMind, Edraw Mind Map and Freemind; these can be productively employed for brainstorming, organizing, and presenting ideas. These mind mapping software and applications can be conveniently accessed through the computer and mobile devices.

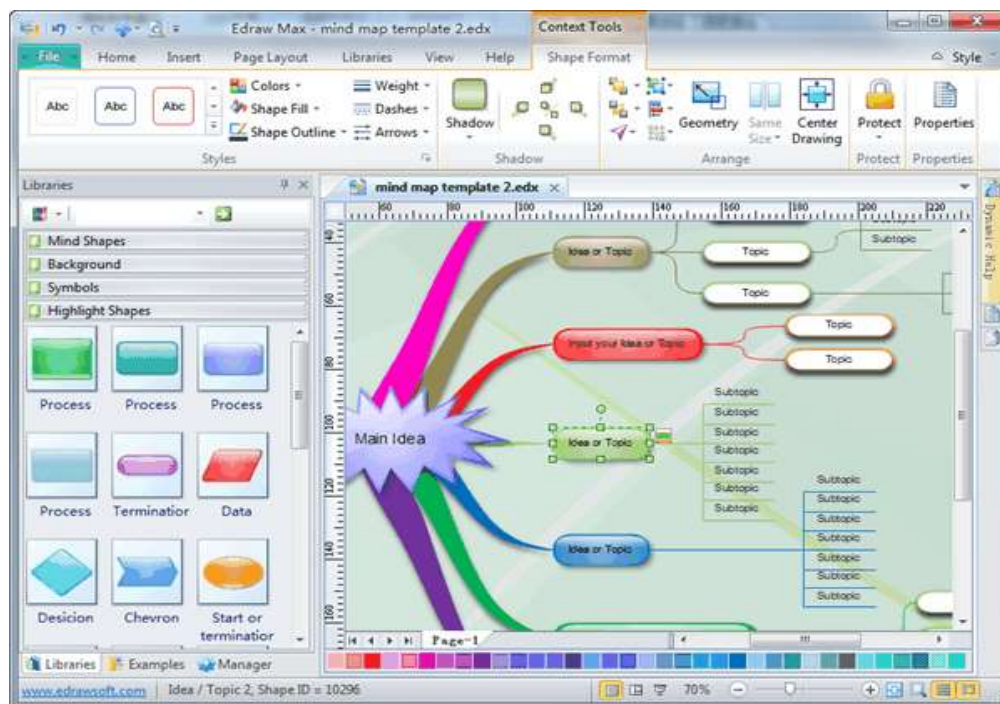


Figure 1: Example of a brainstorming diagram software - 'Edraw Mind Map'

Figure 1 above shows a sample of a diagramming software which 'brainstorms' a core topic. This map was augmented with mind mapping software that aids the mapping process. Students begin the mind map by outlining the core topic in a square in the middle. After that, minor nodes are drawn from this middle square, branching out. From each new single idea, other

nodes are then drawn to state more sub-ideas (from there on, more examples or extra details are further linked to other nodes).

One of the most important steps in generating a mind map is to use colours. Colours aid in differentiating between different sub-topics and also sub-ideas. Budd (2004) suggests that using images, icons and other visual aids such as short film clips in computerized mind mapping are quite useful as an aide-memoire to help learners to link ideas more effectively. Dominic (2014) suggests that one of the ways to create a mind map is by using a mind mapping software that can help our learners to manipulate, colour and restructure the map, its nodes and also branches. By using computer software, the process of producing mind maps also become faster and easier even for novice learners or true beginners. Compare this with the process of creating mind maps on paper that will take far too long even with considerable effort.

Al-Jarf's (2009) research project employed software mind mapping techniques with the experimental group (but not the control group) to measure its overall effects on students' writing attainment. The results of this project suggest that the former group will score significantly higher compared to the latter group. A post-research survey later shows that computerised mind mapping can actually encourage creativity and critical thinking as students became more adept at producing and shaping more and more complex ideas for writing. The findings by Al-Jarf find support in the work of Liu (2011) who explored the effects of different computerized mind mapping levels (from no mapping at all to individual mapping to complex cooperative mapping) on the performance of pre-writing for students with dissimilar writing abilities. Liu found that computerized mind mapping had the same benefits on both low and mid-proficiency writing students compared to those who did not use mind mapping at all. As for high-proficiency writing students, they performed even better especially when they were given the space and time to create individualised mind maps. Indeed, using technology in general will help in the process of teaching and learning, especially for current learners with their penchant for information and computer technologies (see Adnan & Zamari, 2012). Furthermore, there are numerous paths to a higher prospective of mobile learning and mind mapping in teaching ESL writing (Rafidah, Abdul Ghani and Farah, 2017).

Technology-assisted Mind Mapping Technique Implementation in the Pre-writing Class

The aim of our practical small-scale project is to gauge the possibilities and limitations of using computerised mind mapping to encourage our students in the English writing classroom. To this end, we incorporated an online mind mapping component into a university course entitled 'Integrated Language Skills III' as taught in Universiti Teknologi MARA, Malaysia (or MARA University of Technology). Twenty-five students were selected to participate in this research project. We started the research cycle by exposing the participants to online mind mapping techniques using *Bubbl.us* (<https://bubbl.us>). The participants were asked to create simple mind maps for their pre-writing stage. Selected topics for an expository essay were given to all the participants, and based on the topics the participants were asked to create their online mind maps. This was an individual task for all twenty-five participants. At the end of the research cycle, all twenty-five participants successfully generated their individual mind maps with the help of *Bubbl.us* and these were shared with the other participants.

Findings and Results

At the end of the research cycle, a questionnaire was administered to all the participants to investigate the students' attitudes toward mind mapping for their writing classroom. Seventeen questions in all were posed to the participants. Our study found that 90% of the participants viewed online mind maps for learning writing as a positive thing in their English classroom. Their positive attitudes can also be associated with their positive perceptions toward the use of online mind mapping. For instance, more than 70% of the participants believed that creating online mind maps actually improved their novice writing skills. In addition, more than 80% of the participants reported having a positive experience using online mind mapping because they felt that online mind mapping improved the quality of their original ideas.

Conclusion

This study reveals that mind mapping is a very useful tool that can help both educators and students to overcome the complexity of writing and make it more enjoyable. Hence, this technique should be recommended to students, and be used in other language skills courses. Furthermore, our paper also highlights a transformation from traditional conventional ways of teaching to a new innovative one that involves technology. That said, further research on a bigger scale is needed to confirm the present results to provide further useful insights into the benefits of online mind mapping. To sum up, it can safely be argued that online mind mapping techniques will be beneficial for all learners of writing. If students are exposed to online mind mapping in writing classrooms, they not only become more creative but also more critical in generating new and useful ideas for their writing products. And, the best thing about online mind mapping is that several online tools are freely and readily available right now for students and educators alike, who are open to online-based and computer assisted (English) language learning.

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References

- Ab Manan, N. A., Zamari, Z. M., Pillay, I. A., Adnan, A. H. M., Yusof, J., & Raslee, N. N. (2017). Mother tongue interference in the writing of English as a Second Language (ESL) Malay learners. *International Journal of Academic Research in Business and Social Sciences*, 7(11), 1294-1301.
- Abdullah, H., Rahman, N. S. N. A., & Adnan, A. H. M. (2012). *The secondary school English Language reading curriculum: a teacher's perceptions*. Online Submission, ERIC USA.
- Adam, A., & Mowers, H. (2007, November). Get inside their heads with mind mapping. *School Library Journal*, 53(3), 24.
- Adnan, A. H. M. & Ilias, N. (2012). "I think I'm an active learner": a narrative-quantitative research on the metacognitive preparedness of first semester [college students]. *Proceedings of the International Conference on Active Learning (ICAL 2012), Universiti Teknikal Malaysia Melaka (UTeM)*, 1, 121-127.

- Adnan, A. H. M. & Zamari, Z. M. (2012). "I am a Techno-Rebel!" Malaysian academics & their personal experiences of progressing into e-Learning. *Procedia - Social and Behavioral Sciences*, 67, 61-72.
- Adnan, A. H. M. (2005). The 'English Language Dilemma' in Malaysia: Vision, reality and the ethnicity-religion-language tapestry of the Malays. In K. Ariffin, M. Ismail, M. Latif, N. K. Leng & R. Aziz (eds.), *English in Education: Issues and Challenges in the Malaysian Classroom* (pp. 1-13). Shah Alam: UPENA Universiti Teknologi MARA (UiTM Press).
- Adnan, A. H. M. (2006). The link between cognitive development and language acquisition in the early years and implications for language teaching. In K. Ariffin, et al. (eds.) *English in the Malaysian Context* (pp. 1-17). Shah Alam: UPENA Universiti Teknologi MARA (UiTM Press).
- Adnan, A. H. M. (2013). Language use and identity construction in a 'micro-community' of Malay undergraduates. In R. Machart, C. B. Lim, S. N. Lim, & E. Yamato (eds.), *Intersecting Identities and Interculturality: Discourse and Practice* (pp. 91-110). Newcastle upon Tyne: Cambridge Scholars Publishing.
- Adnan, A. H. M. (2014). "Seeing red": practicalities of correcting written work in the Malaysian (faux) ESL context. In H. Harun, et al. (eds.) *Research and Issues in Second and Foreign Language Teaching* (pp. 157-170). Bandar Baru Nilai: USIM Publisher [Universiti Sains Islam Malaysia].
- Adnan, A. H. M. (2017a). Being English teachers in Malaysian Islamic schools: identity narratives from a five year 'Life Journey'. *Arab World English Journal*, 8(1), 220-233.
- Adnan, A. H. M. (2017b). Learning English (and Arabic) in Malaysian Islamic Schools: Language Use and the Construction of Identities. *Arab World English Journal*, 8(3), 407-420.
- Adnan, A. H. M., & Abdullah, H. (2012). Communicative Language Teaching: misconstructions and misunderstandings in the Malaysian context. *English Language Journal (UPSI)*, 5, 79-93.
- Adnan, A. H. M., & Abdullah, H. (2014). Role play as a speaking and listening tool: considerations for Malaysian classrooms. In H. Harun, et al. (eds.) *Research and Issues in Second and Foreign Language Teaching* (pp. 139-155). Bandar Baru Nilai: USIM Publisher [Universiti Sains Islam Malaysia].
- Adnan, A. H. M., Ilias, N., Ramalingam, S., & Mt Tahir, N. T. (2012). Soft skilling Malaysian technical-technological undergraduates: a study of perceived needs and future preparedness. *Proceedings of the International Conference on Behavioural and Social Science Research (ICBSSR 2012), University Tunku Abdul Rahman Malaysia (UTAR)*, 1, 82-89.
- Adnan, A. H. M., Ramalingam, S., Ilias, N., & Mt Tahir, N. T. (2012). Critical thinking, problem solving, lifelong learning and information management skills: a survey of Malaysian ICT students and their learning of soft-skills. *Proceedings of the International Conference on Active Learning (ICAL 2012), Universiti Teknikal Malaysia Melaka (UTeM)*, 1, 330-335.
- Adnan, A. H. M., Ramalingam, S., Ilias, N., & Mt Tahir, N. T. (2014). Acquiring and Practicing Soft Skills: A survey of technical-technological undergraduates at a Malaysian tertiary institution. *Procedia - Social and Behavioral Sciences*, 123, 82-89.
- Al-Jarf, R. (2009). Enhancing freshman students' writing skills with a mind mapping software. Paper presented at the *5th International Scientific Conference, eLearning and Software for Education, Bucharest*, April 2009.

- Bharambe, M. I. (2012). Effectiveness of mind mapping in educational psychology. *Journal of Biological Chemistry*, 2, 10-18.
- Buzan, T. (1993). *The Mind Map Book*. London: BBC Books.
- Budd, J. W. (2004). Mind maps as classroom exercises. *Journal of Economic Education*, 35(1), 41-46.
- Chitravelu, N., Sithamparam, S., & Teh S. C. (2005). *ELT Methodology: Principles and Practice*. Selangor: Penerbit Fajar Bakti.
- Dominic, S. (2014). *Mind mapping using semantic technologies*. Diploma Thesis. Retrieved from https://dip.felk.cvut.cz/browse/pdfcache/salaidom_2014dipl.pdf
- Flower, L. S., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication*, 32, 365-387.
- Ilias, N., & Adnan, A. H. M. (2012). Enhancing learning and retention through 'cognitive linkages': a case study of Malaysian children. *International Journal of the Computer, the Internet and Management*, 20, 1(SP2), 59.1-59.4.
- Ilias, N., & Adnan, A. H. M. (2015). *A Reflective Analysis on Malaysian Teachers' Language Alternation in ESL Classrooms*. Kuala Lumpur: MARA Poly Tech College (KPTM).
- Ilias, N., & Adnan, A. H. M. (2016). *Meaningful Learning from Field Trips: Exploring the World and Constructing Learning Experiences*. Kuala Lumpur: MARA Poly Tech College (KPTM).
- Keles, O. (2012). Elementary Teachers' Views on Mind Mapping. *International Journal of Education*, 4, 93. Retrieved September 22, 2016, from <http://dx.doi.org/10.5296/ijev4il.1327>
- Kementerian Pelajaran Malaysia (Ministry of Education) (2000). *Sukatan Pelajaran Bahasa Inggeris (English language Syllabus)*. Putrajaya: Malaysian Ministry of Education.
- Liu, P. (2011). A study on the use of computerized concept mapping to assist ESL learners' writing. *Computers & Education*, 57(4), 2548-2558.
- McGriff, S. (2007). *Instructional systems program*. Pennsylvania State University, 62(2), 8-25.
- Mercer, N. (2002). *Multicultural Education Programs*. University of Southern California.
- adley, O. A. (1993). *Teaching language in context* (2nd ed.). London: Heinle & Heinle.
- Padang, J. S. M., & Gurning, B. (2014). Improving students' achievement in writing descriptive text through mind-mapping strategy. *Register Journal of English Language Teaching of FBS-Unimed*, 3, 1-11.
- Karim, R. A., Abu, A. G., and Khaja, F. N. M. (2017). Theoretical perspectives and practices of mobile-assisted language learning and mind mapping in the teaching of writing in ESL classrooms. *Journal of English Teaching*, 2 (1), 1-12.
- Riswanto, & Prandika, P. P. (2012). The use of mind mapping strategy in the teaching of writing at SMAN 3 Bengkulu, Indonesia. *International Journal of Humanities and Social Science*, 2, 60-68.
- Svantesson, I. (1989). *Mind mapping & memory: Powerful techniques to help you make better use of your brain*. London: Kogan Page.
- Warsidi, M. M., & Arafah, B. (2013). A collaboration of mind mapping and organizational pattern to improve students' essay writing ability. *E-Journal Program Pascasarjana*.
- Yunus, M. M., & Chien, C. H. (2016). The use of mind mapping strategy in Malaysian University English (MUET) Writing. *Creative Education*, 7, 619-626.
- Zaid, M. A. (1995). Semantic mapping in Communicative Language Teaching. *Forum*, 33(3), 6-16.

- Zamari, Z. M., & Adnan, A. H. M. (2011). Fusing CALL with SALL: The Good English Language Learner community on Facebook as a case in point. *English Language Journal (UPSI)*, 4, 126-146.
- Zamari, Z. M., Adnan, A. H. M., Idris, S. L., & Yusof, J. (2012). Students' perception of using online language learning materials. *Procedia - Social and Behavioral Sciences*, 67, 611-620.