

## THE EFFECTS OF CONCEPT MAPPING ON MATRICULATION STUDENTS' ESSAY WRITING PERFORMANCE

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### Abstract

This study investigated the effectiveness of the concept mapping technique on the factual essay writing performance of fifty Malaysian University English Test (MUET) candidates in a matriculation centre in Perak, Malaysia. MUET is a national English Language examination compulsory for all matriculating and diploma students who wish to enrol in first degree programmes in Malaysian universities. This paper examined the participants' perception on the effectiveness of this concept mapping technique used as a tool to enhance their writing organisational skills in factual essays. Writing is one of the four language components being tested in this test. To determine the effectiveness of the tool, a pre- and a post-test on a test item with similar features and rubrics were conducted prior to and after the lessons respectively. In addition, a 20-item survey questionnaire with 8-point scale adapted from Puteri Zarina (2004; 2014) was administered in this study to identify the students' perception in the effectiveness of the tool in their learning process. The test results showed that students who were taught using the concept maps performed better in the construction of topic sentences than those in the control group who were taught using the listing technique as a form of advance organiser. The survey results also showed that the students generally agreed that the use of concept map as an advance organiser in the lessons had indeed helped them in the construction of clear topic sentences in their factual essays. The findings suggested that more studies could be conducted on the effectiveness of concept maps in helping students achieve better performance in other language skills.

**Keywords:** concept map, advance organiser, MUET essay, topic sentences, matriculation

### 1.0 INTRODUCTION

Malaysian University English Test (MUET) is a compulsory public examination for students to enrol in Malaysian tertiary institutions. This test serves as a platform preparing students for their tertiary education which emphasises English as the medium of communication. Despite having eleven years of exposure in English in primary and secondary schools, the lack of competence in English among Malaysian students particularly in the writing and speaking skills has often been lamented by many. This study is focused on the essay writing component of the MUET writing paper as it is the language skill that is the most problematic to the students. Students' incompetence in this language skill is reflected in the past results of the MUET writing component (Hamzah et al. 2013).

Writing and the activities involved in composing are highly conventional. Malaysian learners' presentation of their essays normally lacks proper organisational structure which often leads to readers' incomprehension of the main points in the essays. This research looked specifically at the effectiveness of concept map as an advance organiser on MUET's students' essay organisational structure. The structural organisation of an academic essay normally follows a rather fixed structure. Every paragraph should include a topic sentence that identifies the main idea of the paragraph. This topic sentence also states the point the writer wishes to make about that subject. Generally, the topic sentence appears at the beginning of the paragraph. It is often the paragraph's very first sentence. A paragraph's topic sentence must be general enough to express the

paragraph's overall subject. However, it should be specific enough for the readers to gain understanding of the paragraph's main subject and point.

A concept map is a device that works on the premise of schematic display for representing the relationships among a set of concepts. A concept is a perceived constancy in events or objects, or records of events or objects which is designated by a label (Novak, 1998). Concept mapping is a technique that one can use for expressing his or her understanding of a conceptual framework (Novak & Gowin, 1984). The focus, however, is not on individual concepts, but on the association of a set of concepts in a conceptual framework. The emphasis is on the organisation of the whole, not on the individual entity. Simply put, concept mapping is a representation of knowledge which is organised and exemplified into cognitive structures. The technique of concept mapping has been applied in both instructional and an assessment activities albeit with some difficulties when used in the latter context due to lack of rigour and statistical reliability (Brinkerhoff and Booth, 2013, p. 44). As the present research only studied the use of concept map as an instructional tool, its function as assessment tool was not focused on.

The research was aimed at identifying the effectiveness of using concept mapping as a form of advance organiser in the teaching of essay organisational pattern to 50 matriculation students in a matriculation centre in Perak, Malaysia who sat for their MUET in November 2013. Another aim of this research was to seek students' perception towards the use of concept mapping as a form of advance organiser in the construction of their MUET essay organisational pattern. These aims generated the following research questions:

- a. How effective was the concept map as an advance organiser in helping the students in forming clear topic sentences in their MUET factual essays?
- b. How did the students respond to the lessons using the concept map as an advance organiser in forming clear topic sentences in their MUET essays?

The hypotheses for the study were:

- i. There is no difference in the pre- test results between the students in the treatment group and those in the control group;
- ii. There is no difference in the post- test results between the students in the treatment group and those in the control group, and
- iii. There is no difference in perception between the students in the treatment group and those in the control group about the usefulness of the tools in the construction of clear topic sentences in their expository essays.

## 2.0 CONCEPTUAL FRAMEWORK

This research applied a strategic planned beginning of a lesson based on a theory founded by David Ausubel (1960). His 'Advance Organiser Model' is derived from a theory developed by Ausubel himself known as the Subsumption Theory of Meaningful Verbal Learning which constitutes the use of advance organisers and meaningful learning. This theory is grounded in the work of Jean Piaget (1968) who advocates the idea that people actively "organise experience" and who believes that meaningful learning is determined by how the learners' prior knowledge is organised to incorporate new knowledge. A main component of learning is subsumption where new material is related to relevant ideas in our existing schema in general. Ausubel stresses that the use of advance organisers in a lesson helps strengthen students' cognitive structure and develop their ability to retain new information by associating the learning materials to the conceptual framework that is presented prior to any lesson (Joyce and Weil, 2000).

Accompanying this theoretical perspective, Ausubel's approach to teaching and learning is one, which is a 'top-down', or 'general-to-advanced' approach to learning (Van Patten, Chao, and Reigeluth, 1986). Advance organisers may be presented in many different graphical forms. One of them is a tool called concept mapping which is a form of visual or spatial strategy introduced by Novak (1998). Concept maps are tools for organising and representing knowledge which is suitable for the organising of ideas in essays.

Concept mapping varies from other knowledge representations in that the ideas deployed in the process are grounded in the constructivist epistemology and Ausubel's assimilation theory of cognitive learning. Furthermore, this technique also places great emphasis on the importance of prior knowledge in the acquisition of new knowledge (Ausubel et al., 1978; Novak & Gowin, 1984; Novak & Musonda, 1991).

## 3.0 RELATED LITERATURE REVIEW

The effectiveness of concept mapping as a teaching tool is supported by numerous research. Davies (2010)

states that concept mapping is a useful teaching and learning tool which is an effective device for both students and teachers as it enriches and provides new directions in education in the future. It is effective because concept mapping allows students to understand the relationships between concepts and hence understand those concepts themselves and the domain to which they belong. In their study on the effectiveness of concept maps among fresh students majoring in Biology at Brigham Young University, Brinkerhoff and Booth (2013) managed to show that students who used concept maps scored significantly higher than their peers who did not use the tool. This study yields evidence that supports the benefits of the concept mapping as a tool that can really help students to learn more meaningfully (Able & Freeze, 2006). Most university students normally fail to understand the connections of the learning items as they are more accustomed to memorising and regurgitating bits of information and recallable facts (Briscoe & LaMaster, 1991). After being exposed to the concept mapping technique in the lessons, the students in the treatment group managed to develop skills in establishing connections between various biology concepts.

This result showed that the students in the treatment group who used concept mapping were able to perform better than their peers in the control group. Bernstein (2011) also concurred that concept mapping was a proven tool to help students in a moderately challenging learning context. Her project looked at the effect of using concept mapping as a reflective and constructive exercise in an environmental analysis course at Lewis and Clark College in Portland, Oregon. The students in the research felt more positively challenged by the exercises using concept mapping and ultimately performed better in the course. Her study showed the wonders of concept mapping in helping the students foster deep learning despite being at the optimal level of intellectual discomfort.

The strength of concept maps as a teaching and learning tool to enhance the learning process is corroborated by a research done by Shimerda (2007) who found that the concept mapping technique helped enhance 'meaningful learning' of the accounting concepts among the accounting students in his study. He concluded that students' creation of concept maps allowed a learning evolution between a pre- and post-learning perspective which requires an adjustment process. This process of adjustment is one of the ways that helps students gain clarity in understanding concepts. Both learning and concept map creation are interactive with the latter being a useful tool that enhances students' learning process. Students' ability to link new learning items with prior concepts is demonstrated with the concept maps.

The benefits of concept map are further pursued by a research by Canasi, Amyot and Tira (2014). This study shows the ability of the mapping exercise in helping students concentrate on a main subject or discipline, link interrelated concepts, establish and/or build a knowledge base on which they reflect upon. The participating students in the Dental Hygiene Department, University of Missouri-Kansas City, America agreed that concept mapping was a useful tool in helping them acquire meaningful learning. The tool is proven to be a useful aid in the acquisition of complex material for processing and retaining and ultimately meaningful learning. The use of concept maps in the lessons had also significantly reduced failures in the course final exam by 14% from the previous 2 years, complemented by general improvements in final exam scores by 17%.

Strategy instruction is a teaching approach that facilitates students' development of strategies for all stages of the writing process and teaches self-regulation of performance of the strategies (Mohammad Reza and Giti, 2009). This teaching approach assists students in their writing by dissecting the writing tasks and making the sub-skills more explicit. One of the tools in this strategy instruction is the concept mapping. Giti (2011) agrees that the instruction of concept mapping strategy has a positive effect on EFL learners' writing achievements. In another study by Lee and Cho (2010), it is suggested that the students who used the concept mapping strategy for their writing planning outperformed the students who did not use the strategy in Korean writing.

Skeete (2012) examined the effectiveness of using concept maps and web pages in undergraduate literature courses at The University of the West Indies, St. Augustine conducted over a three-year period (2008/2009 to 2010/2011). This study was a reflection by a lecturer who attempted to motivate her students, encourage their participation and foster critical thinking and appreciation for the discipline using two assessment tools i.e. concept maps and web pages. Some students were also found to have incorporated the map into their oral presentations even when they were not required to perform so. In addition, the maps also proved ideal for eliciting information and ideas from students at the beginning of the course to emphasise certain issues or to initiate discussion of a literary text under study. Skeete concluded that the concept map was more suitable for individual tasks. These findings proved the benefits of concept maps as they encourage students' creativity in the various stages of reading and writing such as brainstorming, discussion, revision, etc.

There is also extensive evidence that drawing a concept mapping enables students to engage in advanced

cognitive functions (Novak & Gowin, 1984). In their study, Villalon et al, (2011) present a novel approach in the educational application of automated concept maps as embedded in writing lessons. It was found that from the students' perspective, concept mapping is useful to help students perform reflective analysis of their own knowledge. In addition, concept mapping also helps students view their own writing from a different perspective. From the instructor's point of view, concept mapping is a beneficial tool for rapid assessment of students' understanding of concepts and theories. Although the present study uses organically derived concept maps, the findings indicate the benefits of the concept map as a learning tool.

All these literature provide a strong evidence of the effectiveness of the concept map in the teaching and learning environment. Hence, the current study focuses on the use of this tool in the teaching of MUET essay writing as no research has been directed to examine its use in the development of writing skills in MUET.

#### 4.0 METHODOLOGY

The research employed a pre-test – post-test quasi experimental research design to explore the effects of concept mapping in the teaching of topic sentences for factual essays among MUET students. In addition, a survey was also distributed at the end of the lessons with the aim to seek the perception of the MUET candidates on the effects of concept maps as advance organisers in the construction of topic sentences in their essays.

The treatment group was taught the construction of topic sentences in their factual essays using the concept mapping technique as an advance organiser. The control group in this study, on the other hand, was exposed to lessons using listing of ideas as advance organiser. In these lessons, teachers are responsible to provide students with the opportunities to discover the structure of the subject matter for themselves by drawing up lists of ideas. The students in this study sat for the MUET in the October/November 2013 session in their own matriculation centre which was one of the MUET centres in the district. The study was conducted two months prior to the MUET session. The participating students came from two matriculation classes in the institution. This institution was chosen as a case study because it was the only matriculation centre in Perak where concept maps were taught as advance organisers.

For the purpose of this study, all fifty subjects who were naturally assembled into two classes by the matriculation centre were divided into two groups: treatment and control group. The treatment group was taught to use concept mapping as advance organisers for the construction of topic sentences in factual essays while the control group was taught to use listing as an advance organiser. Two different teachers with equal teaching experience were involved in this project. All measures were done to ensure that the control group would not lose out on any learning point during the two-month lessons. The only difference is the technique of organising ideas for the construction of topic sentences at the beginning of the writing process. Prior to the lessons, both groups were made to sit for the pre-test while the post-test was administered immediately after the last lesson. The students in both groups were required to write a factual essay each for the 50-minute tests based on a given title. To ensure reliability of test instruments, the pre-test was administered to a class of students with similar demographic patterns in a matriculation centre in another state. The marking of the papers was done by a MUET teacher from a neighbouring school using the standard MUET marking criteria designed by the Malaysian Examination Council. The administration of the survey questionnaire was done immediately after the entire writing lessons were executed.

Data from the pre-test and post-test were analysed using statistical analysis to test the hypotheses. This statistical measure was used as there was only one independent variable namely the use of concept maps in the teaching of topic sentences in factual essays. Three out of the 21-item questionnaire on a 7-point scale focused on the students' demographic details namely, age, sex and the Malaysian public examination grade called Sijil Pelajaran Malaysia (SPM) or Malaysian Certificate of Education (MCE).

#### 5.0 ANALYSIS

An independent-sample t-test via Statistical Packages for Social Sciences (SPSS) was used in this analysis to determine whether the mean difference was significant at the 0.05 level in the pre-test scores for the construction of the topic sentences between the treatment and the control group.

Table 1 below shows that the independent samples *t* test failed to reveal a statistically reliable difference between the mean of the treatment group ( $M=62.4$ ,  $SD=8.47$ ) and the control group ( $M=61.2$ ,  $SD=6.64$ ),  $t(48) = 0.558$ ,  $p = .580$ ,  $p > 0.05$ ;  $\alpha = .05$ . Based on this result, it is found that the students who received lessons using concept maps as advance organisers to construct clear topic sentences in expository essay obtained lower or equal scores than those who used the listing technique in the pre-test.

**Table 1:** The Independent-sample T-test results for the pre-test scores in the construction of the topic sentences between both groups (total scores)

Group Statistics					
	stream	N	Mean	Std. Deviation	Std. Error Mean
pretest	treatment	25	62.36	8.465	1.693
	control	25	61.16	6.638	1.328

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
pretest	Equal variances assumed	1.652	.205	.558	48	.580	1.200	2.151	-3.126	5.526
	Equal variances not assumed			.558	45.416	.580	1.200	2.151	-3.132	5.532

Table 2 below shows that there is a significant difference between the treatment and the control group in post-test scores of the construction of topic sentences in the expository essays. The independent samples *t* test revealed a statistically reliable difference between the mean of the treatment group (M=70.3, SD=7.82) and the control group (M=59.7, SD=6.07),  $t(48) = 5.336, p = .000, p < 0.05; \alpha = .05$ . Based on this result, it is found that the students who received lessons using concept maps as advance organisers to construct clear topic sentences in expository essay obtained higher scores than those who used the listing technique in the post-test.

**Table 2:** The Independent-sample T-test results for the post-test scores in the construction of the topic sentences between both groups (total scores)

Group Statistics					
	stream	N	Mean	Std. Deviation	Std. Error Mean
posttest	treatment	25	70.28	7.818	1.564
	control	25	59.72	6.066	1.213

## Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
posttest	Equal variances assumed	1.474	.231	5.336	48	.000	10.560	1.979	6.581	14.539
	Equal variances not assumed			5.336	45.208	.000	10.560	1.979	6.574	14.546

Table 3 below shows that there is a significant difference in the students' perception of the effectiveness of the lessons between both groups. The independent samples *t* test revealed a statistically reliable difference between the mean of the treatment group ( $M=7.32$ ,  $SD=.416$ ) and the control group ( $M=2.62$ ,  $SD=.640$ ),  $t(46) = 30.45$ ,  $p = .000$ ,  $p < 0.05$ ;  $\alpha = .05$ . Therefore, the students who received lessons using concept maps as advance organisers in the treatment group found the lessons helpful in the construction of clear topic sentences in their expository essays.

**Table 3:** The Independent-sample T-test results for the perception between the students in the treatment group and control group about the usefulness of the tools in the construction of clear topic sentences in their expository essays

## Group Statistics

	stream	N	Mean	Std. Deviation	Std. Error Mean
perception_mean	treatment	25	7.3200	.41552	.08310
	control	23	2.6184	.63945	.13333

## Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
perception - mean	Equal variances assumed	4.527	.039	30.448	46	.000	4.70164	.15442	4.39082	5.01247
	Equal variances not assumed			29.925	37.258	.000	4.70164	.15711	4.38338	5.01991

## 6.0 DISCUSSION AND CONCLUSION

Hypothesis 1 was rejected because the results obtained in the pre-test could have been either lower or equal between both groups. This may be due to the nature of the question in the pre-test that affected the students' performance. This unfavourable result may have been due to the idiosyncrasies of the student population in the case study. This result may also have been attributed to the fact that the students were not aware of any particular pre-writing technique that could help them organise and structure their essays more effectively.

The results indicated that students can learn more effectively if they are alert to and aware of the learning processes and then decide to act on this sensitivity (Giti, 2011). It was also shown that concept mapping technique was a useful tool that teachers can use to help their students in forming clear and concise topic sentences in the MUET essays. Teachers should identify their students' diverse learning styles to achieve the desired teaching and learning outcomes. Helping the students identify with particular writing techniques like concept mapping can provide them the much needed guiding tool for effectively organised essays. This is in line with the new development in the education for the future which relies on effective teaching and learning tool (Davies, 2010).

The study has undoubtedly some implications for language teaching and learning in ESL. Teachers should employ creative techniques like the concept mapping strategy to help increase their students' confidence in writing. Additionally, the paper also has some implications for syllabus design. Concept-based teaching exposes the students to the importance of classifying and reinforce their creativity and self-awareness. Not only is this way of teaching useful for the development of the students' writing skills but also enhances their sense of retention, understanding, problem-solving ability and classroom performance.

Concept mapping is a useful strategy, but like any other strategies, it can be overused indiscriminately. The concept mapping technique that has the potential to promote learners' organisational ability and teachers should add them to their repertoire of teaching tools. It is thus recommended that more extensive studies be done to unearth the wonders of the advance organisers specifically via the use of concept maps in helping students achieve better performance in all the language skills.

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