

**IMPACT OF I-THINK MAPS ON THE FLOW OF IDEAS AND
WRITING PERFORMANCE OF YEAR FIVE PUPILS**

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**FACULTY OF EDUCATION
UNIVERSITY OF MALAYA
KUALA LUMPUR**

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**DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR
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Original Literary Work Declaration

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**IMPACT OF I-THINK MAPS ON THE FLOW OF IDEAS AND WRITING
PERFORMANCE OF YEAR FIVE PUPILS**

Field of Study:

ENGLISH LANGUAGE EDUCATION

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ABSTRACT

The aim of this study was to investigate the impact of i-think Maps on the flow of ideas and writing performance of Year Five pupils. The use of i-think Maps as a cognitive tool enables pupils to activate and illustrate their flow of ideas in the i-think Maps templates during the planning and editing stages of the recursive process of writing.

A total of 28 pupils participated in this pre experimental: one group pretest post-test study where treatment lessons using four i-think Maps were carried out for 10 weeks. The qualitative aspect of this study focused on structured interviews, classroom and i-think Maps observations and document analysis.

Paired sample t-Test was used to determine the mean differences of the pre-test and post-test scores using the SPSS program quantitatively. There was a suggested significant difference in the scores for the pre-test ($M=7.71$, $SD=5.643$) and post-test ($M=10.47$, $SD=5.196$); conditions $t(27) = -9.295$, $p = 0.000$ which explains that the results were significant at 1%. Since this study was based on non-randomized selection of one class of pupils without a control group, other extraneous variables such as self-motivation and input from private tutors, parents or siblings may have also contributed to the increase in the flow of ideas and consequently, the post test scores.

However, on the whole, this study confirms past studies on the positive influence of using i-think Maps in enhancing pupils' writing skills. There are definitely pertinent pedagogical implications in employing i-think Maps for facilitating flow of ideas and writing performance. As the increase in the post-test scores is exclusively representative of the 28 participants of this study, further study on the impact of i-think Maps in ESL writing using two groups of randomly selected

pupils over a longer period is recommended to establish more conclusive results of using i-think Maps in the English Language classroom.

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IMPAK PETA MINDA I-THINK TERHADAP ALIRAN IDEA DAN PRESTASI MENULIS MURID TAHUN LIMA

ABSTRAK

Kajian ini bertujuan menyiasat impak peta pemikiran i-think terhadap aliran idea dan prestasi menulis di kalangan murid Tahun Lima. Penggunaan peta pemikiran i-think sebagai alat kognitif membantu merangsang serta melakarkan idea mereka ke dalam templat peta pemikiran i-think di tahap merancang serta mengedit penulisan mereka berdasarkan proses penulisan rekursif.

Seramai 28 orang murid terlibat dalam pra-eksperimen: satu kumpulan pra dan pos ujian di mana pengajaran rawatan menggunakan empat peta pemikiran i-think dijalankan selama 10 minggu. Dari aspek kualitatif, kajian ini berfokus kepada temubual berstruktur, pemerhatian di dalam bilik darjah serta pemerhatian terhadap peta pemikiran i-think dan analisis dokumen.

Sampel ujian-T berpasangan digunakan untuk menentukan perbezaan skor min pra dan pos ujian penulisan melalui program SPSS secara kuantitatif. Terdapat perbezaan ketara dalam skor pra ujian (Min 7.71, SP=5.643) dan pos ujian (Min=10.47, SP=5.196); dengan syarat $t(27)=-9.295$, $p=0.000$ yang menerangkan keputusan signifikan pada 1%. Oleh kerana pemilihan murid dibuat secara tidak rawak serta hanya satu kumpulan pelajar sahaja yang terlibat dalam eksperimen ini tanpa kumpulan kawalan, maka ada kemungkinan terdapat faktor lain seperti imput daripada guru tuisyen, ibu bapa atau adik beradik yang menyumbang kepada peningkatan dalam skor pos ujian penulisan.

Namun, secara keseluruhannya, kajian ini mengesahkan keputusan kajian-kajian lepas tentang pengaruh positif penggunaan peta pemikiran i-think dalam memperbaiki kemahiran penulisan murid. Terdapat implikasi pedagogi yang penting

dalam penggunaan peta pemikiran i-think yang membantu murid terhadap aliran idea dan prestasi menulis. Walaubagaimanapun, peningkatan dalam skor pos-ujian adalah pencapaian eksklusif 28 orang peserta kajian ini. Oleh yang demikian, kajian yang lebih mendalam tentang penggunaan peta pemikiran i-think dalam penulisan Bahasa Inggeris disyorkan dimana dua kumpulan murid dipilih secara rawak dan jangkamasa kajian yang lebih lama digunakan untuk mendapatkan keputusan yang lebih konklusif dalam penggunaan peta pemikiran i-think di dalam kelas penulisan Bahasa Inggeris.

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LIST OF ABBREVIATIONS

UPSR	-	Ujian Penilaian Sekolah Rendah
PISA	-	Program for International Student Assessment
HOTS	-	Higher Order Thinking Skills
MBMMBI	-	Memartabatkan Bahasa Melayu dan Memperkasakan Bahasa Inggeris
ESOL	-	English for Speakers of Other Languages
EFL	-	English as a Foreign Language

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Writing is a difficult skill to master among second language learners (Hyland and Milton, 1997; Beck, Llosa and Frederick, 2013). The writing skill could be regarded as an array of activities that range from the manual features of writing to the more difficult act of composing (Salihovic and Akbarov, 2011).

According to Nor Puteh et al (2010), pupils consider writing in English as a very difficult skill to acquire (Finkbeiner and Schuler, 2017). The skill in writing needs the brain to process ideas and sequence them in a cohesive and coherent manner before penning them down to make it good reading material. Therefore, writing is definitely a challenging cognitive process which demands a lot of thinking and planning on the part of the writer to capture his/her thoughts into meaningful words (Englert, Yong, Dunsmore, Collings and Wolbers, 2007). Malaysian pupils being second language learners of English experience more writing problems compared to native speakers and English Language teachers face an uphill task of teaching them this skill. Moreover, in the writing process also, the end product cannot be obtained in an instant. Instead, it needs to be revised and edited a few times before it is deemed complete.

In Malaysian schools, the skill of writing is given much emphasis as soon as children are enrolled into primary schools at the age of seven. They are taught to make very basic and simple sentences from Years One to Three and as they progress into Years Four to Six, they are taught guided writing to write simple paragraphs (KSSR Teacher's Guidebook: English Language 2011). Unfortunately, not all the

pupils are able to write proficiently when they reach Year Six due to their inability to express their thoughts effectively in writing (Puteh, Rahmat and Abdul Karim, 2010). The pupils also lack the motivation and self-confidence to write as they have always lagged behind in being proficient writers (Pajares, 2003).

Moreover, the decline in English Language proficiency amongst Malaysian pupils has been a serious dilemma encountered by the Malaysian Education System for the past few years (Darmi and Albion, 2013). In international assessment tests such as PISA, the weak performance of Malaysian pupils is a harsh reminder of our low proficiency level in English Language. Malaysia was positioned 52nd out of 65 countries as stated in the 2012 PISA report published in 2014 (Darmi and Albion, 2013). In 2011 and 2013, the implementation of the Primary School Standard Curriculum (KSSR) and the policy 'To Uphold Bahasa Malaysia and to Strengthen the English Language' (MBMMBI) respectively were aimed to address this decline with the hope to increase pupils' competency in the English Language.

Currently, the latest change was the announcement by the Malaysian Examination Board in September 2015 regarding the new English Language writing format for Ujian Penilaian Sekolah Rendah (UPSR), which is a summative examination at the end of primary schooling in Malaysia. The new English Language examination format which will be used in 2016 places more emphasis on the writing component where it will be counted as two examination papers (comprehension and writing) instead of the one examination paper previously. Another compulsory aspect is the inclusion of higher order thinking skills (HOTS) questions in the new English Language examination format which warrants for pupils to be more cognitively competent and intellectually equipped to sit for the UPSR examination (Ganapathy and Kaur, 2014).

Thus, the implementation of Thinking Maps or i-think maps (the Malaysian version) in 2013 is a timely policy aimed to help Malaysian pupils think ‘out of the box’ instead of being guided by the teacher all the time. According to Agensi Inovasi Malaysia, “i-THINK maps train Malaysian pupils to think critically, analytically and to be adaptable in preparation for the future. The policy helps schools impart thinking skills to pupils, allowing them to be lifelong learners; great at solving problems and coming up with creative solutions” (Agensi Inovasi Malaysia, 2012-2014, pg. 24).

The i-Think programme emphasizes the use of “eight thinking maps namely the circle map, bubble map, double bubble map, tree map, flow map, multi-flow map, brace map, and bridge map” (Hyerle, Alper and Curtis, 2014, p.6) that can be used as a platform to transform pupils’ thinking skills in education thus enhancing teachers’ and pupils’ thinking capabilities. (Asmawi, 2014 as cited in Balakrishnan et al, 2014; Yunus and Chien, 2016).

Thinking Maps or i-think Maps facilitate pupils’ thinking process through activation of their prior knowledge (Gurlitt and Renkl, 2010). This skill needs to be channeled into the English Language classroom to enhance pupils’ writing performance (Asmawi, 2014 as cited in Balakrishnan et al, 2014). Since the concept of i-think Maps is to help learners organize new information based on their prior knowledge, they would be able to think critically and sequence their ideas systematically in the planning or pre-writing stage and slowly progress into while-writing or drafting stage.

According to Brown (2011), pre-writing is a very crucial step in developing writing skills. During this time, pupils’ creativity can flow as they brainstorm and discuss in groups after the teacher introduces a topic. When writing, the flow of ideas

is important because pupils need to plan what they want to write (Hartshorn et al, 2010). If they fail to organize their thoughts and have a proper sketch of what to write, they would not be able to produce good essays. According to Sun and Feng (2009), pupils are taught to record their ideas into a mind map, spidergram or a linear form as they can evaluate the flow and quality of their ideas.

Pre-writing can be utilized by pupils to write down their flow of ideas which can be used in their actual essay writing. This becomes the foundation of what they would write. When pupils generate ideas according to the topic, they can concentrate on the organization of their essay writing. This involves in the logical sequencing of their ideas in a systematic manner. (Negari, 2011).

This process eradicates the need for pupils to pause and wonder about what to write next. When pupils reach the end of one section, they simply look to their pre-writing plan (i-think Map) for a prompt about what comes next. The use of i-think Maps in the pre-writing stage is necessary as pupils need a cognitive visual tool to illustrate their thoughts in a map which they can systematically use in the while-writing or drafting stage.

In other words, writing good essays has a direct link with pupils' flow of ideas and writing performance which is connected to their thinking process. Pupils who are able to write well can organize ideas and put their thoughts into words meaningfully to relay a message to their audience effectively (Nurrohmah, 2016).

Pupils' attitude towards writing is also an important factor because a positive attitude would spur pupils to make an effort to write better. According to Erkan (2011) pupils who are proficient in other language skills of English, namely, reading, speaking, listening and grammar tend to exhibit a negative attitude towards writing. According to Sun and Feng (2009) the use of visual tools such as mind maps help

make ideas flow in a clear, hierarchical manner which will help pupils with the sequential arrangement and organization of their texts. Therefore, by using i-think Maps, pupils would be able to have systematic and well-structured ideas to write which in turn would create a positive attitude towards writing.

In the English Language classroom, the use of i-think Maps by teachers to teach pupils needs to be encouraged especially to nurture higher order thinking skills (HOTS) among ESL learners. This is because educators especially teachers must decide on strategies best suited to increase pupils' achievement in writing (Brown, 2011). Tools that link to thinking processes help pupils organize ideas, and eventually enhances their reading, writing and thinking skills (Gallagher, 2011).

However, study on the use of i-think Maps to improve learning has been concentrated mainly on pupils from middle and high schools (Al-naza and Abu-Owda, 2014; Ayverdi, Nakiboglu and Oz Aydin, 2013; Liu, 2011) with very less research on its impact on primary school pupils' learning. In addition, i-think Maps are more widely used in teaching science (Knight, Spooner, Browder, Smith and Wood, 2013; Bahm, 2013; Bramwell-Lalor and Rainford, 2014) and web-based subjects (Hwang, Kuo, Chen and Ho, 2013; Aslani, Haghani, Moshtaghi and Zeinali, 2012) compared to teaching and learning in English Language.

Comparatively, research on the use of i-think Maps to enhance writing among primary school pupils is scarcer. Many research works identify using graphic organizers and other visual strategies for reading, listening and speaking (Pang, 2014) but very minimal are available on the use of i-think Maps to improve writing skills in English Language. This scenario reveals an interesting niche for the impact of i-think Maps on the flow of ideas and writing performance of Year Five pupils.

In spite of the many research studies available globally, there has been to the researcher's knowledge, a very small number of research studies which target Malaysian primary pupils' flow of ideas and writing performance using i-think Maps. Therefore, this study is carried out to investigate the impact of using i-think Maps on the flow of ideas and writing performance of Year Five pupils.

1.2 Statement of the Problem

In the Malaysian English Language classroom, primary school pupils need to master the writing skill to equip them for more in-depth writing experience as they step into secondary school and institutions of higher learning. Although good writing skill among these pupils is vital, many are still struggling because it is a challenging cognitive effort. The writing process can be both exasperating and overwhelming because it entails so much that must be mastered, namely, drafting, editing, proofreading and many other writing conventions such as spelling, sentences structure, and transition (Diliberto, 2004; Harris, Graham and Mason, 2003).

Moreover, most of the pupils have difficulties in producing good flow of ideas which are well organized, coherent and cohesive. They also face problems in their writing performance as they are unable to use a variety of sentences and link them logically to produce good essays. In addition, the inclusion of the English writing examination in UPSR has caused apprehension amongst English teachers and pupils especially those who are weak in writing as these pupils need to obtain a pass in this writing examination.

These pupils need a lot of guidance in their thought patterns to sequence their ideas systematically in the pre-writing or planning stage. In order for the English Language teacher to help these learners to organize/assemble their thoughts in a systematic manner, i-think Maps need to be used in the writing classroom in the planning or pre-writing stage (Hyerle, 2012; Pang, 2013). In an attempt to address the abovementioned concerns, this research describes the impact of using i-think Maps on the flow of ideas and writing performance of Year Five pupils of a National School located in the Keramat District in Kuala Lumpur. This is a Malay medium school and the pupils being second language learners of English have difficulties in English proficiency and more so in writing. The constant drop in the UPSR English Language examination results of this school for the past five years (2013-2017) is testament to the need for more well-planned instructions on the part of English teachers to help these pupils in writing. Thus, the aim of this study is to find out the impact of using i-think Maps on the flow of ideas and writing performance among Year Five ESL pupils.

1.3 Purpose of the Study

In the teaching of English language in Malaysian primary schools, the main aspects emphasized are the teaching of basic skills of listening, speaking, reading and writing. The English Language curriculum for Years One and Two stresses the improvement of basic language skills, namely listening, speaking, reading and writing so that the pupils will have a good foundation to develop their competency in the language. From Year Three onwards a fifth module is added which is grammar (KSSR Teacher's Guidebook English Language, 2011). Writing is regarded as the

most complex skill to master among Malaysian pupils (Darus and Subramaniam, 2009; Nik et al, 2010; Yunus et al, 2013).

Therefore, the aim of this research is to investigate the impact of i-think Maps on the flow of ideas and writing performance of Year Five pupils of a National School in Kuala Lumpur. The study also aims to provide data concerning the impact of using i- think Maps on the flow of ideas and writing performance of Year Five pupils.

1.4 Research Objectives

1. To find out to how i-think Maps help Year Five pupils' flow of ideas during writing.
2. To find out if there's an impact in Year Five pupils' writing performance after i-think Maps are used during writing.

1.5 Research Questions

1. How do i-think Maps help Year Five pupils' flow of ideas during writing?
2. Is there an impact in Year Five pupils' writing performance after using i-think Maps?

1.6 Conceptual Framework

The Conceptual Framework comprises of two fractions, one includes the independent variable namely the i-think Maps and the second includes dependent variables which are the flow of ideas and writing performance. In this study, the experimental group is given a cycle of treatment or intervention using i-think Maps. There are two main characteristics of this study which is firstly, the use of a single group of participants namely a class of pupils from Year 5 Ibnu Sina. These pupils are all exposed to the

same treatment and assessments. The second characteristic involves the assessment of a dependent variable before and after a treatment is implemented (i.e., a pre-test–posttest design).

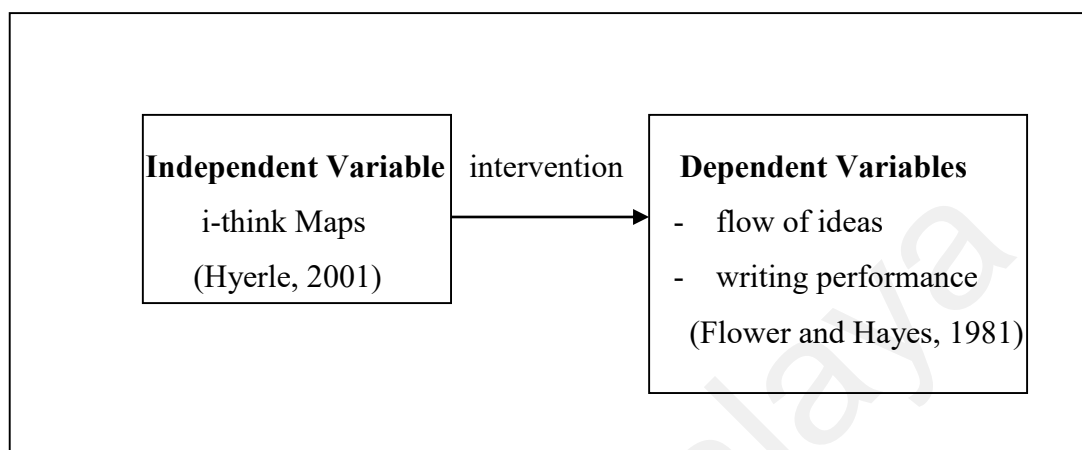


Figure 1.1 Conceptual Framework of a pre-experimental study

This study is grounded on the cognitive perspective of writing based on the Cognitive Process Theory of Writing (Flower and Hayes, 1981). According to this theory, the “composing process is a set of distinctive thinking process which writers orchestrate or organize during the act of composing” (Flower and Hayes, 1981, p. 366). The i-think Maps are used as the intervention to gauge whether they impact the flow of ideas and writing performance of Year 5 pupils. The operational definitions of the independent variable, namely i-think Maps and dependent variables, flow of ideas and writing performance are detailed under Section 1.9 (pp. 11-14) with more in depth explanations in Chapter 2 of the Literature Review. Therefore, through the intervention, the impact of the i-think Maps on the flow of ideas and writing performance is ascertained.

1.7 Significance of the Study

This research is significant due to four reasons. Firstly, it would expose teachers to

use i-think Maps to enhance the writing performance of Year Five pupils. This is because as second language learners, these pupils are not proficient writers in English and therefore pupils need to be exposed to the benefits of using i-think Maps in their writing.

Secondly, it may help to improve pupils' writing performance by enabling them to make various mental connections to their prior knowledge in the pre-writing and while-writing stages using i-think Maps. It will also encourage pupils to start using i-think Maps as a cognitive tool for other subjects too.

Thirdly, i-think Maps would create pupils who write with a purpose and transform them into autonomous learners as they provide deeper understanding for the importance of proper planning during the pre-writing stage of process writing. Pupils will also be instilled with a mindset that although writing is tedious, it is a rewarding process if it is planned well in the pre-writing stage and not merely a product they achieve at an instant.

Finally, this research could be used as a guide for future studies. Since i-think Maps are easily learned and user-friendly, schools and institutions of higher learning can use them for various subjects and evaluate the impact of i-think Maps on pupils' writing performance, score achievements, pupils' confidence and cooperation among peers.

1.8 Limitations of the Study

This research was carried out on pupils from a non-random Year Five class which does not represent all Year Five pupils from a school, district or state. Therefore, the research outcome cannot be generalized to all Year Five pupils.

Secondly, this pre-experimental research comprising one group pre-test post-test design was carried out on only one class of pupils. Therefore, without the comparison group, there are internal and external validity threats to this study.

Thirdly, only four i-think Maps namely the circle map, bubble map, tree map and flow map were used extensively in this study in line with the UPSR English Writing paper format. Thus, pupils will be more familiar with these four maps only instead of the eight i-think Maps.

Finally, only five cycles of treatment lessons using i-think Maps were carried out which cannot be a conclusive yardstick for gauging the pupils' level of writing as it is a recursive skill which develops over a period of time.

1.9 Operational Definitions

Terms that are defined enable researchers to think clearly about their research and communicate their findings and ideas accurately with precision (Creswell, 2012).

The following terms are operationally defined :

Flow of Ideas

The trait of ideas focusing on the clear identification of supporting details of a main topic or prompts (Culham, 2003). For this study, details are single words, phrases or clauses used to describe the central focus of the writing prompt.

Writing performance

Writing performance based on Section C of the UPSR Writing Paper tests pupils' ability to write an essay between 80 to 100 words. The marking scheme for Section C provided by the Malaysian Examination Board is shown in Table 1.1.

Table 1.1

Marking Scheme for Section C of UPSR English Writing

BAND	DESCRIPTIONS	MARKS
EXCELLENT (EX)	<ul style="list-style-type: none"> • Excellent and confident use of the language. • Ideas conveyed clearly through a variety of sentence structures. • Confident use of new words to express ideas. • Ideas are well-planned, organized and are linked so as to sustain the interest of the reader. • Overall accurate use of spelling and punctuation. 	21-25
GOOD (GD)	<ul style="list-style-type: none"> • Proficient use of the language throughout. • Attempts made to construct a variety of sentence structure but occasional errors occur. • Most ideas are well-organized, relevant and conveyed clearly. • New words to express ideas. • Punctuation and spelling errors may occur occasionally but overall meaning is clear. 	13 – 20
SATISFACTORY (ST)	<ul style="list-style-type: none"> • Simple sentences with minor errors but meaning is still clear. • Most words given are used correctly. • Satisfactory presentation of ideas. • Vocabulary is adequate to convey meaning. • A few punctuation and spelling errors may be found in the script. 	7 – 12
WEAK (WK)	<ul style="list-style-type: none"> • Poor use of language. • Multiple errors found in the sentences. • Ideas are incomprehensible even after a few readings. • Limited and incorrect use of vocabulary. • Direct lifting. • Chunking of words. 	1 – 6

(Adopted from Lembaga Peperiksaan Malaysia, 2016)

Pre-Writing Stage

It is also known as the planning phase which “includes the sub-operations of generating, organizing and goal setting. Planning involves retrieving the relevant information from long term memory and the task environment” (Flower and Hayes, 1981, p. 372).

Process Writing

A composition paradigm attempts to make the “invisible” stages of writing more tangible as it separates the strategies into stages such as planning, drafting, revising, editing, and publishing (Tompkins, 2004).

Scaffolding:

The “support provided by a teacher to pupils as they read and write” (Tomkins and Jones, 2019).

Visual tools:

Visuals tools are “organizers, webs, and thinking-process maps which exhibit patterns of thinking” (Hyerle, 2000, p.12).

i-think Maps:

The Malaysian version of i-think Maps consist of “eight visual tools based on fundamental thinking skills” (Agensi Inovasi Malaysia, 2012- 2014, p. 24); These maps include Circle Map, Bubble Map, Double Bubble Map, Tree Map, Brace Map, Flow Map, Multi-flow Map, and the Bridge Map” (Hyerle, Alper and Curtis, 2014, p.6).

Circle Map:

Thinking Map that is used for "representing and brainstorming ideas, defining words by showing context clues, and identifying audience and author's point of view" (Hyerle, Alper and Curtis, 2014, p.6).

Circle maps can be used to list everything discussed about a particular topic or idea used during brainstorming sessions (Agensi Inovasi Malaysia, 2012).

Bubble Map:

Thinking Map that is used for "expanding descriptive vocabulary, describing characters using adjectives, and providing descriptive details for writing" (Hyerle, Alper and Curtis, 2014, p.6).

Bubble maps are used to list down adjectives related to quantities or attributes so that it can be described more clearly for better understanding (Agensi Inovasi Malaysia, 2012).

Tree Map:

Thinking Map that is used for "identifying main ideas, supporting ideas, organizing topics and details for writing including taking notes for lectures and research papers" (Hyerle, Alper and Curtis, 2014, p.6).

Tree maps are used to classify information into different categories to understand the whole concept (Agensi Inovasi Malaysia, 2012).

Flow Map:

Thinking Map that is used for "sequencing story plots by stages and sub-stages, analyzing and prioritizing important events, and sequencing paragraphs for writing" (Hyerle, Alper and Curtis, 2014, p.6).

Flow maps are used to write the steps in a process systematically so that we can understand the method correctly (Agensi Inovasi Malaysia, 2012).

1.10 Chapter Summary

This chapter discusses the background of the problem, the problem statement, the purpose and significance of this study together with its limitations to find out the impact of using i-think Maps on the flow of ideas and writing performance of Year Five pupils.

Universiti Malaya

CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction

This study looks at theoretical aspects that are related to the study of i-think Maps and its impact on pupils' flow of ideas and writing performance in the ESL classroom. It also investigates the impact of using i-think Maps as a cognitive tool to produce better writers among primary school children especially Year Five pupils.

2.2 Cognitive Process Theory of Writing

Flower and Hayes (1981) stated that the writing process is a “series of decisions and choices” (p. 365) which the writer makes. They also point out that the decisions of what to write is guided by a thinking process in order to “understand the nature of rhetorical choices in good and poor writers” (p. 366)

According to Flower and Hayes (1981), the Cognitive Process Theory of Writing lays groundwork for more in-depth knowledge about thinking processes in writing. This theory is founded on cognitive orientation and is focused on the interconnectivity of thinking, learning and writing. According the Flower and Hayes (1981) the cognitive processing theory is based on four key points:

- i) “The process of writing is best understood as a set of distinctive thinking processes which writers orchestrate or organize during the act of composing.
- ii) These processes have a hierarchal, highly embedded organization in which any given process can be embedded within any other.
- iii.) The act of composing itself is a goal-directed thinking process, guided by the writer's own growing network of goals; and

- iv) Writers create their own goals in two key ways: by generating both high level goals and supporting sub-goals which embody the writer’s developing sense of purpose, and then, at times, by changing major goals or even establishing entirely new ones based on what has been learned in the act of writing” (Flower and Hayes, 1981; p.366).

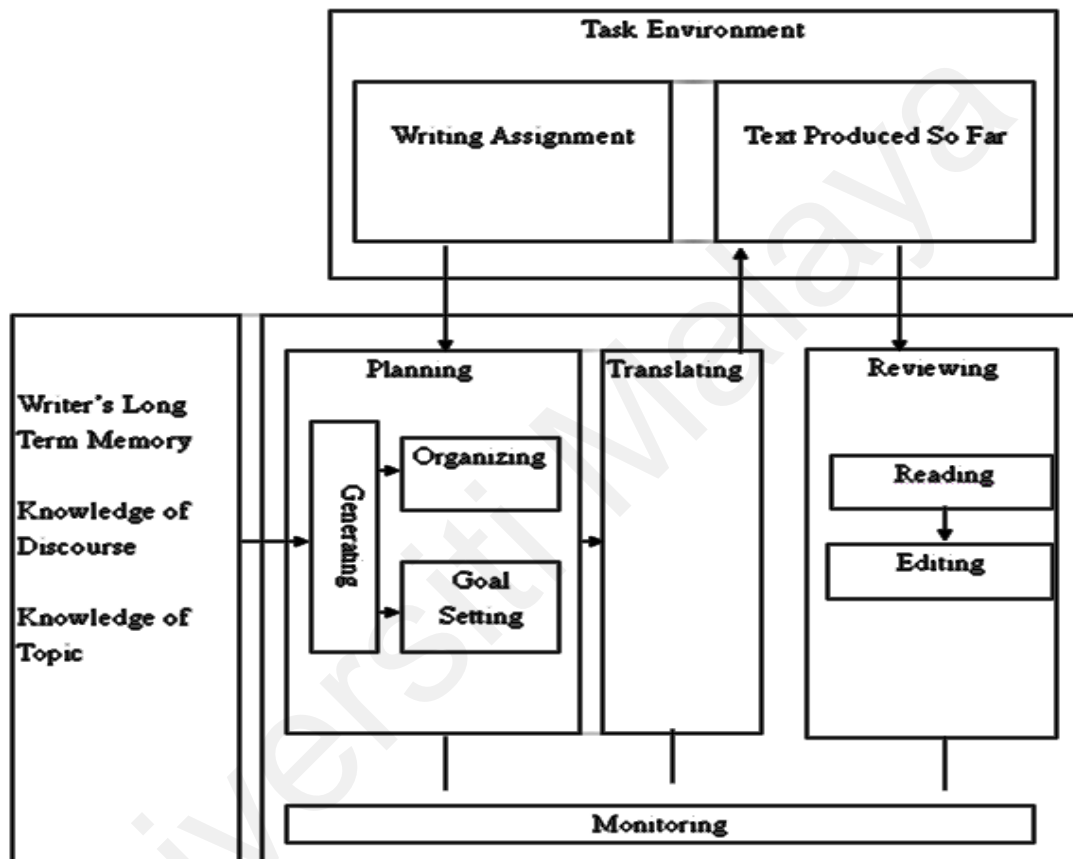


Figure 2.1 Cognitive Process Theory of Writing Model (Flower and Hayes, 1981)

Flower and Hayes (1981) also pointed out that the writing task entails three main components such as the task environment, the writer’s long term memory and the writing processes. The task environment includes the elements that the writer interacts with before he/she begins writing such as the rhetorical problem or writing assignment and eventually the expanding text itself. The writer’s long term memory “can exist in the mind or outside resources such as books. They are the storehouse of

knowledge about the topic, audience, writing plans and problem representation” (p. 371). Meanwhile, the writing process is divided into planning, translating and reviewing which are controlled by a monitor. For example, in the beginning a writer would have a topic. Then after planning what to write, a framework would be created. This leads to paragraphs that are linked one to another. Finally, the writing will be edited and revisions will be made.

Planning

Planning is divided into three sub-strategies: generating ideas, organizing, and goal-setting. According to the Flower and Hayes model, generating ideas consists of retrieving relevant information from the task environment and long-term memory, which is a storehouse of knowledge about discourse and topic. Organizing entails selecting the material retrieved by the generating process and organizing them into writing. The other sub-strategy of planning is goal setting. In this sub-strategy, some materials from the generating process are standards that are used to judge the text in terms of meeting the goal specified.

Translating

In the Flower and Hayes writing model, the second part of the writing process, the act of composing referred to as "translating," is when writers actually put their ideas into visible language, an activity through which the writer transforms the ideas from a linear or hierarchic plan into sentences (Flower and Hayes, 1981). It involves putting ideas into language (text generation) and then into written words (transcription) to build a cohesive and coherent text (Berninger et al., 1994, 1997, 1998).

Reviewing

Reading and editing are the sub-strategies of reviewing. In these sub-strategies, the writer examines any material written with the goal of correcting anything that would prevent the text from meeting the established goals. This includes correcting grammatical errors and altering the contents of the writing. Reviewing is a conscious process in which writers choose to read and examine what they have written either as a “springboard to further translating or with an eye to systematically evaluating and/or revising the text” (Flower and Hayes, 1981, p. 374)

Monitoring

According to Flower and Hayes (1981), monitoring the writing process well is the ability to think about thinking and to continuously coordinate and examine the mental manipulation in sustaining and shifting the focus of attention among sub-processes in order to ensure the writing progresses and has quality. This process involves the writer’s current writing process which is also referred to as the “writing strategist” (p. 374) where the writer progresses from one process to the next.

Although the processes of writing are hierarchically organized, they are not linear but recursive as the processes are embedded within other components. This means while a writer is translating his/her ideas, he /she may generate or organize a new set of ideas to further improve his/her previous ideas. Thus, the writer is not constrained to use these processes in a fixed order or according to stages. This is powerful because of its flexibility as it allows the writer to work on a few basic processes such as plan, translate and review at his/her own pace.

According to Flower and Hayes (1981), “writing is a goal-directed process” (p. 377) which is the foundation of the Cognitive Process Theory. The goals of writing are divided into process goals and content goals. Process goals refer to the

instruction writers give to themselves about what to write. Content goals refer to all the writer wants to convey to his/her audience. These content goals develop into a detailed organization of goals and sub-goals. Therefore it can be summed up that the goal-directed writing process aids in the purposefulness in writing.

Flower and Hayes (1981) also stated that writers generate their own goals by creating goals and supportive sub-goals which form the aim of writing in which they are free to change by re-generating their top-level goals to suit their thinking processes. During this phase, the writer relies on his/her schema which grows and changes through library researches and/or fresh inferences. These two processes are further broken down into three patterns of goals namely explore and consolidate, state and develop and write and regenerate.

Explore and Consolidate

Although this pattern happens in the beginning of composition, it can also happen at other times too. At first, while the writer thinks about the topic, jots ideas or just starts writing, the writer discovers a very specific goal by exploring his/her own knowledge. Then he/she reviews the information and consolidates it producing more complex ideas.

State and Develop

This second pattern deals with the direct work of composing. The writer begins with a high-level goal such as a main idea or theme for his/her writing which he/she then proceeds to develop with sub-goals or subsequent ideas. These goals become clearer as the composing process takes place which form into the actual text. The relationship with creating goals and generating ideas is reciprocal as the writer's ideas were the ones that produced these goals.

Write and Regenerate

In this phase, the writer produces the actual text or essay which is a more detailed representation of what he wants to say. The writer uses a goal to generate ideas and then consolidates those ideas and uses them to revise or regenerate new and more complex ideas. This is actually the creative power of the writer who can discover, improve, perform, assess and renew his/her own writing goals.

Thus, writing instruction based on the Cognitive Process Theory shows a comprehensible understanding that the act of writing is based on the organization of cognitive processes. Pupils who use the i-think Maps reflect on the writing process because they use a map to describe the characteristics of an idea or concept and its association to other ideas or goals.

Grabe and Kaplan (1996) agree with Flower and Hayes' model whereby they also state the writing process is not linear but recursive in which writers constantly go back and forth through the pre writing, writing and revising tasks.

Pulungan (2018) stated that during the process of writing, students lose track of what they are writing because of the excess of ideas that invade their minds. Thus, in order to accommodate and conceptualize these ideas, Think Aloud Protocol Technique is used to help students in their writing. This is based on Flower and Hayes' Cognitive Process Theory of Writing Model (1981) which highlights the competence of students in writing. It was found that basically, through the cognitive processes, students were able to comprehend the complexities of the activities related to pre-writing, while-writing and post-writing. The findings of the study showed that the students showed considerable progress in the learning of writing in English.

2.3 i-think Maps

Visual tools have various terms depending upon the author's use of the procedure namely mind maps, cognitive mapping, idea mapping, graphic organizers, concept maps, "patterned note taking, webs, construct procedure, graphic overview, networking, flowcharting and semantic mapping" (Miccinati, 1988 as cited in Gardner, 2015).

Hyerle (1995) is the originator of Thinking Maps which are made of eight thinking maps for easy to use learning and information presentation. According to Hyerle (1995), these new visual tool called Thinking Maps "would enable one to construct, organize, assess and convey knowledge (p. 85) even better than a graphic organizer" (Hyerle, 1995).

In Malaysia, the use of i-think Maps is a joint effort by the Malaysian Ministry of Education and Agensi Inovasi Malaysia to enable Malaysian students to think critically and be cognitively competent to be better equipped for the future. Moreover, in order for pupils to be lifelong learners, problem solvers and innovative through higher order thinking skills (HOTS), the i-think Maps policy was introduced in 2013 (Agensi Inovasi Malaysia, 2013). These i-think Maps were adapted from Dr. David Hyerle's (1995) Thinking School.

According to Hyerle (1996), visual tools serve several purposes. One is to organize information and to be able to see relationships, patterns or main ideas. The other is to engage in a number of higher order thinking processes, such as summarizing, comparing, ranking and problem solving (Hyerle, 1996). He reiterates that these improved "visual tools help pupils learn more effectively and efficiently" (Hyerle, 2001, p.102). Moreover pupils have increased memory retention although lessons are taught in much shorter time. (Hyerle and Curtis, 2001).

Hyerle noticed that “pupils could complete semantic maps such as brainstorm webs and graphic organizers, but they were unsure of what to do with this information once they had written it down namely they were unable to develop it into a well-organized essay” (1995, p. 85). He observed peoples’ thinking capabilities and found that “spatial formats which address every thinking process could be utilized to generate and organize thoughts and ideas, either on paper or by using....software” (Hyerle, 1995, p. 85). These visual tools were named Thinking Maps and Hyerle used them as tools to enhance understanding at “all educational levels, in kindergarten through the twelfth grade” (Hyerle, 1995, p. 85).

Hyerle writes:

pupils may exit our schools with the ability to read text, but not build meaning. Our pupils' *cognitive skills* development-the foundation of every school's goals or mission statement-are randomly supported, rarely raised to the level of fluency, and nearly absent as a distinct dimension of assessment. And, as we know from our brain research, we must facilitate the *patterning* of content knowledge as a foundation for learning. Thinking Maps, as a language of visual tools based on fundamental thinking skills, has been proven as one route for unifying content and process instruction, and assessment of products (Hyerle, 2000, p. 102).

Hyerle (2000) believes that people do not necessarily have to think linearly. He realized that by using Thinking Maps, pupils become autonomous and confident learners. Moreover, pupils and educators alike can see the thought patterns sketched in the Thinking Maps by pupils. The Thinking Maps are flexible and therefore they are adaptable and easier for pupils to use them during learning (Hyerle, 1995). Hyerle acknowledges that the main cause for these Thinking Maps’ triumph is based on the fact that that they are "a common visual language among pupils and between pupils and teachers" (1995, p. 87-88).

A notable point to look into is investigating the difference between Thinking Maps and other visual tools such as graphic organizers and brainstorm webs. Pupils who use graphic organizers need to fill in a worksheet as they are utilized mainly for remote tasks. They are very organized and task-based too. On the other hand webs are more adaptable thus allowing more flexibility for pupils to record their knowledge of a certain topic easily. Thinking Maps combine the “generative quality of brainstorming webs, the organizing structure of graphic organizers and the deep cognitive processing found in concept maps” (Hyerle and Curtis, 2004, p.7), which allows pupils to shift their thoughts into the maps allowing them to become a familiar visual tool understood by other pupils and educators (Hyerle and Curtis, 2004).

Thinking Maps are made up of eight key thinking skills namely “define, describe, compare, contrast, classify, divide a whole into parts, sequence, cause and effect and comprehend relationships” (Hyerle and Yeager, 2007, p. 234 - 240). When pupils become experts in these eight thinking skills, they can relate these thinking abilities to problem solving using Thinking Maps. Pupils are then capable of linking these thinking skills into all the subjects they learn in school. Thinking Maps are exceptional because they can be easily understood by pupils and used by teachers in the classroom. In addition, pupils can use these maps as continuous learning tools as they utilize them for activities that need them to think. Teachers can also use these Thinking Maps as an evaluation instrument. Since Thinking Maps inculcate eight thinking processes, they increase higher level critical thinking skills which are very crucial for pupils’ educational development. As pupils use Thinking Maps based on metacognitive skills to understand a subject in an in-depth manner, they are required to “develop high-quality thinking and improve inter-dependent, collaborative

thinking” sequence to comprehend and complete the map (Hyerle and Alper, 2014, p. 82).

Since Thinking Maps are reliable, flexible and easy to use, they encourage student- centeredness and “cooperative learning, concept development, reflective thinking, creativity, clarity of communication, and continuous cognitive development" (Hyerle, 1995, p. 89).

Hyerle (1995) grouped a set of eight metacognitive visual tools embedded in the eight cognitive skills in Thinking Maps such as “defining in context, describing attributes, comparing and contrasting, classification, part-whole spatial reasoning, sequencing, cause and effect reasoning, and reasoning by analogy” (Hyerle, 1995). He used the tools to develop a simple representation for learning language and information. There are eight diagrams which show what the eight Maps are about:

1. Circle type map

Circle type map is used in descriptions, brainstorming, defining ideas, things, concepts and objects. In the center of the circle we use a name, an idea, a concept, a symbol we want to define, and describe. Circle Maps are a very useful to present concepts, specifically among primary school pupils.

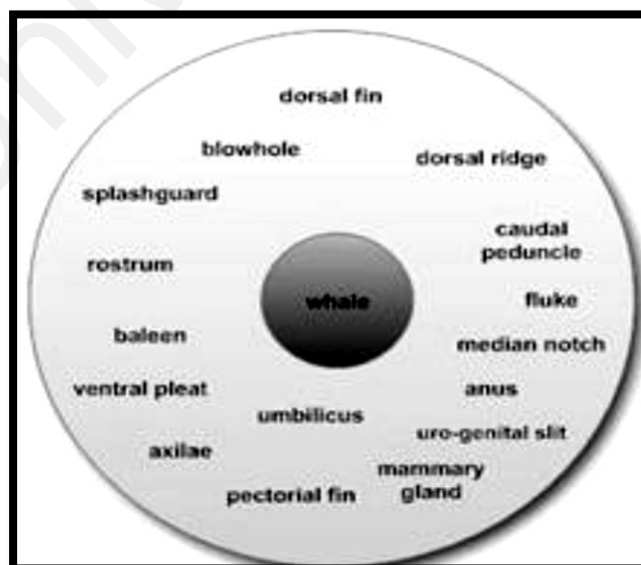


Figure 2.2 Circle Map Source: www.mindtools.com

2. Bubble map

Bubble maps represent the second type of logical diagrams of mental representations and are used for describing, characterizing the qualities of objects, things, ideas, concepts etc. In the central circle the object to describe is located, and around it, its features are connected with other connected circles. A Bubble Map is used for the same purpose as Circle Maps, allowing clear connection between an idea and its features. It can include parts of speech, ideas or pieces of text.

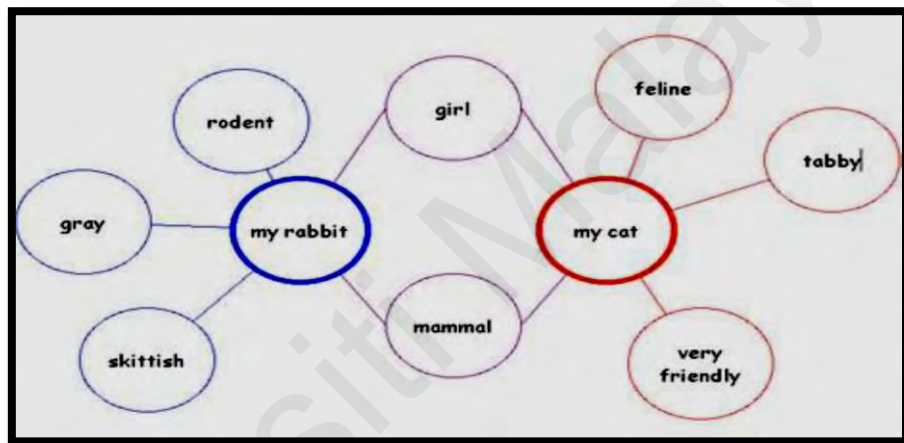


Figure 2.3 Bubble Map Source: www.mindtools.com

3. Double Bubble Maps

In order to compare and contrast descriptions between two ideas, Double Bubble Maps are used. This is similar with the Venn diagrams, which combines the characteristics of Circle Maps and Double Bubble Maps.

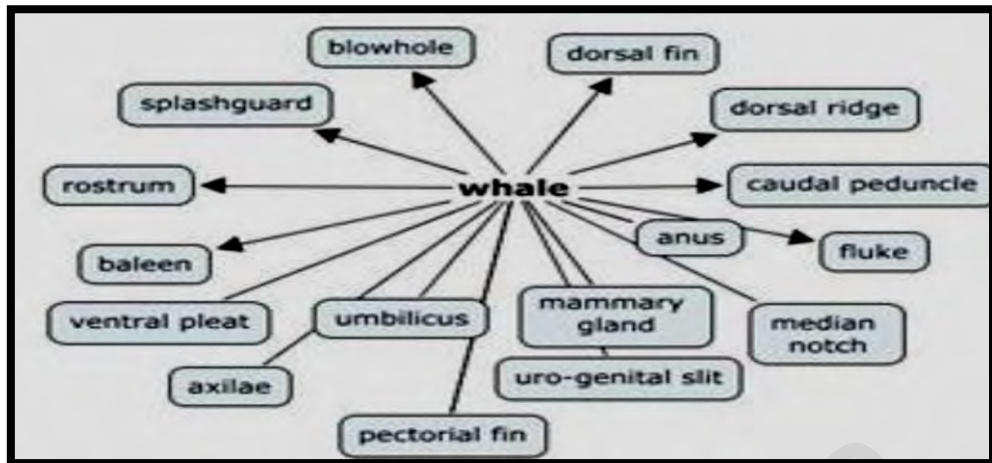


Figure 2.4 Double Bubble Map. Source: www.mindtools.com.

4. Flow Map

Flow map divides and co-ordinates a process in stages and phases. It is based on the sequencing and ordering principle. Hyerle's Flow Map is used to present information in a sequence.

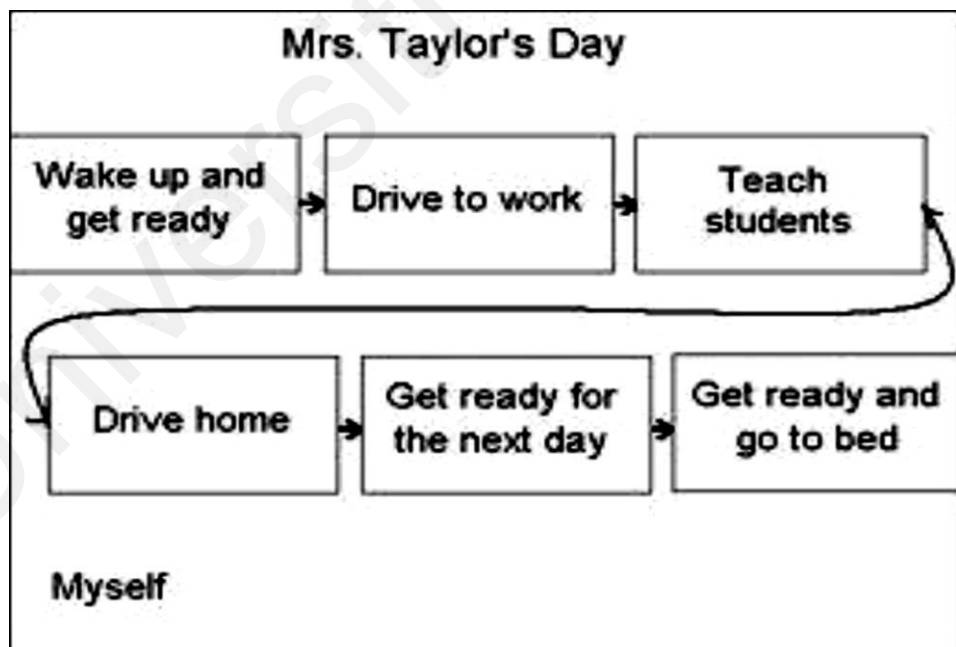


Figure 2.5 Flow Map. Source: www.mindtools.com

5. A Multi-Flow Map

A Multi-Flow Map is a combination of two or more Flow Maps, making parallel or interconnected sequences. Therefore, they represent cause and effect diagrams without a hierarchical structure but with multiple effects.

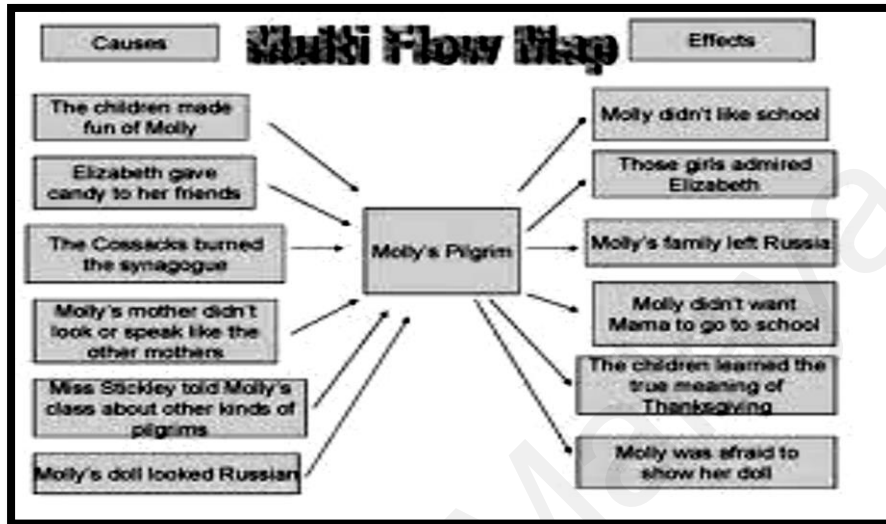


Figure 2.6 Multi-Flow Map. Source: www.mindtools.com.

6. Brace Maps

Brace Maps are used for showing parts of ideas or notions in detail which allows the pupils to understand the relationship between the object or idea and its parts.

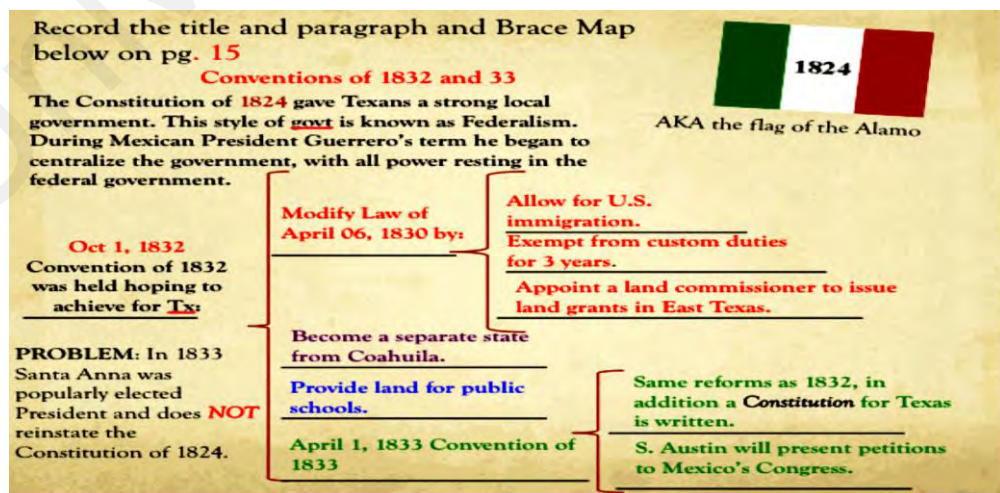


Figure 2.7 Brace Map. Source: www.mindtools.com.

7. Tree Maps

Tree maps these are used for classification and grouping. Ideas and objects are sorted in categories and groups while sometimes new categories and groups are created. On the top of the tree, the name of the classes, categories and general ideas are written. Under each category, the groups are written. These types of logical diagrams are ideal for studying texts, social surveys and others.

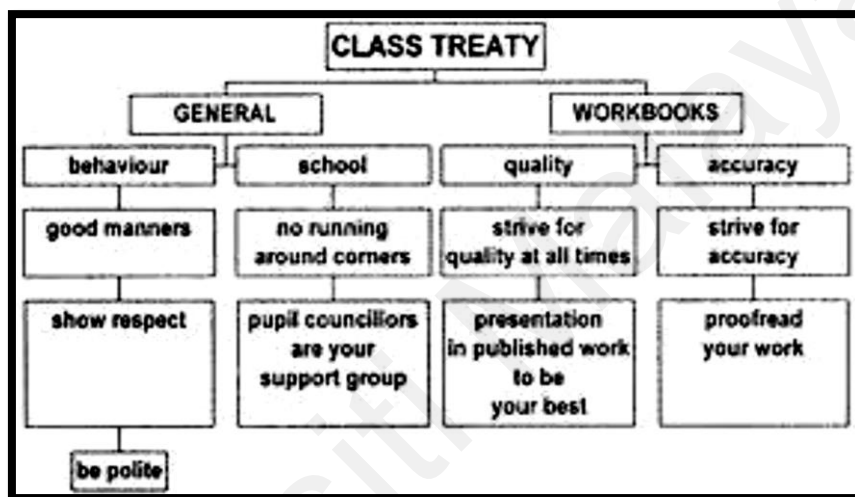


Figure 2.8 Tree Map. Source: www.mindtools.com.

8. Bridge Maps

Bridge Maps can be used for simple similarities and also for metaphors. It can also be used to compare multiple aspects that are related to the same concepts. Each factor will be represented by a Bridge Map.

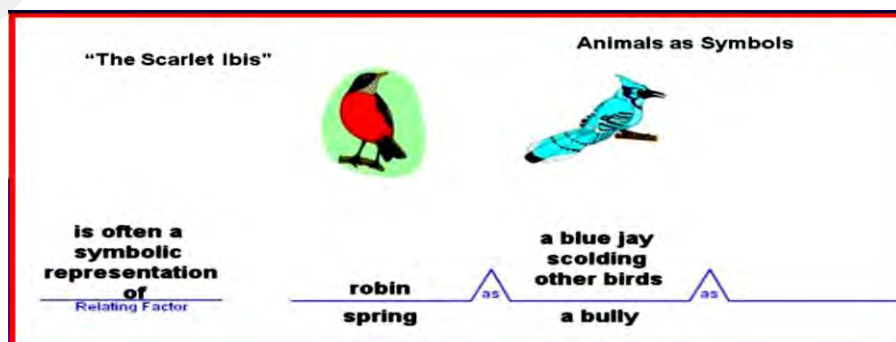


Figure 2.9 Bridge Map Source: www.mindtools.com.

2.4 Writing Performance

Writing performance constitutes the ability of pupils to write in order to communicate and share their emotions and thoughts on paper, to convey what they know and believe into credible arguments and enhance meaning through properly structured text. In the most complete form, writing performance can be as tangible as an artistic expression of one's mind through the arrangement of words, phrases and sentences all weaved together. Children improve writing performance by building new skills replacing their old, progressing from basic sentences to interesting stories and compositions. Spelling, vocabulary, grammar, and organization assemble and grow collectively to support the pupils as they exhibit more advanced writing skills.

Writing performance also includes pupils' ability in spelling, punctuation, capitalization and learning basic grammar rules in their early stages of writing. As Malaysian children progress from Level 1 (7 – 9 years old) to Level 2 (10 -12 years old) of their primary education, writing becomes more demanding and complex with varied difficulties.

According to the Malaysian Curriculum Development Centre (2015), writing is defined as “pupils’ ability to write and present a range of texts using appropriate language, style and form for different purposes and audience through a variety of media. They learn to write words, phrases, sentences and paragraphs in neat, legible print and cursive writing (p.14)”.

Moreover, pupils are exposed to simple essay writing processes such as planning, drafting, revising, editing and publishing. Additionally, spelling, punctuation and grammar checks are also emphasised. At the beginning, writing is guided but gradually the pupils are geared towards independent writing as the teacher progressively allows them room to express themselves as they develop their writing

skills. As pupils reach Year Six, they will be able to write different genres using suitable language, flair and form via various types of media.

The writing performance of pupils in Year 6 is assessed using bands that categorize their writing such as Excellent, Good, Satisfactory and Weak provided by Lembaga Peperiksaan Malaysia. In the Excellent category, pupils' writing must exhibit excellent and confident use of the language with ideas conveyed clearly through a variety of sentence structures. They must also use new words to express ideas confidently. Their ideas must be well-planned, organized and linked to sustain the interest of the readers. There must also be an overall precise usage of spelling and punctuation.

The Good category of writing needs to exhibit proficient use of the language with attempts made to construct a variety of sentence structures although occasional errors occur. Most of the ideas must be well-organized, relevant and conveyed clearly. In addition, new words to express ideas are necessary. Although punctuation and spelling errors may occur occasionally, the overall meaning is clear.

In the meantime, the Satisfactory category allows for simple sentences with minor errors but with a clear meaning. Most of the narrative prompts given must be used correctly with a satisfactory presentation of ideas. There must be adequate use of vocabulary that conveys meaning clearly. A few punctuation and spelling errors may be found in the script.

Finally, the Weak category exemplifies poor use of language with multiple errors found in sentences. The ideas are incomprehensible even after a few readings. The vocabulary used is limited and incorrect. There are also direct lifting and chunking of the narrative prompts.

According to Rahimi (2013), writing performance refers to the ability to compose, to record beliefs, emotions and thinking patterns, communicate and sow ideas to the audience through the means of language. It also refers to the ability to assemble together what one thinks or wants to convey using words where the audience or persons reading it will be able to decipher the feelings, thoughts and ideas nearly as accurately as to what the writer is trying to communicate.

According to Graham (2006), educators should look out for these factors in pupils' writing performance:

- clear and fully developed ideas.
- well planned and straight forward text.
- precise and effective use of words.
- various sentences that are fluent with authentic language structures,
- suitable manner or mood for maximum effect on the audience,
- correct spelling and minimal grammar mistakes.
- understandable, eye-catching and available.

2.5 Flow of Ideas

According to Culham (2003) pupils' desire to capture what they think motivates them to do the hard work of attempting to write, moving from pictures to letters and from words to sentences. Culham (2003) affirms that teachers aid pupils in looking out for good ideas in writing whether their own or from others or from their daily routines. New writers can get good ideas from perceptions, happenings, enquiries and remarks.

In order to create flow of ideas, a coherent link between ideas is needful. In addition, a good topic sentence at the beginning of each paragraph, linkers and various sentence patterns are important too. This allows the ideas to sequence logically from one paragraph to the other thus enabling the audience to understand what is being read. (Smith, 2013).

Linkers comprising words or phrases are used to make writing flow. They can :

- string words, sentences and paragraphs together;
- demonstrate the link between ideas;
- show the sequence of paragraphs and their prominence;
- signal when a new idea is being presented;
- indicate to readers the suitability of the idea;
- present a gist or an ending (Smith, 2013).

Good flow of ideas is indicated through paragraphs. A good paragraph:

- comprises a topic or a single idea. A topic/new idea should be written in a new paragraph.
- begins with a topic sentence which is well developed with vivid explanations about the topic sentence quoting relevant examples.
- linked with the previous paragraph and points to the following paragraph (if needful).

In addition, a paragraph also needs to be coherent, logical and comprehensible. This means it needs to be well organized and sequential. The sentences used should be well linked to one another based on the topic sentence producing logical and valid ideas. (Pack and Coyle, 2012).

In order to convey clear meaning and to present the writing proficiently, accurate punctuation is definitely vital. Good grammar is also significant in guaranteeing that the readers understand the writing accurately. (Brokop and Persall, 2010).

2.6 Review of Past Studies on Visual Tools

The following are summaries of studies on the use of visual tools by academics which are important references for this study. Since studies on the use of i-think Maps are limited, the benefits of other visual tools are discussed to further strengthen the concept that visual tools enhance pupils' writing abilities. According to Hyerle (2004), "i-think Maps may be defined as a synthesis of three types of visual tools that educators and business people have used for generations namely mind-mapping brainstorming webs, graphic organizers and thinking process tools such as concept mapping" (p. 7). Therefore, the use of the visual tools mentioned below, are important cognitive tools that aid pupils' and teachers' thinking alike.

Visual tools are used by teachers to enable students to make connections, get ideas and understand concepts through pieces of information they visualize to enhance their cognitive abilities. They are platforms that visually help pupils increase their knowledge. Britsch (2011) stressed that today's "intensely visualized culture" (Mirzoeff, 2005, p 228) required classroom language that has an infusion of multimodal, semiotics, digital and non-digital images, including visual literacy to shape the curriculum and to mediate classroom language learning (Jewitt, 2008). In his study, teachers undergoing a 16 week graduate course were exposed to visual learning. Though this exposure, the communicative abilities of these ESOL undergraduate teachers and in service teachers were enhanced.

Moreover, visual tools benefited pupils with special needs too. In an exploratory study by Senokossoff and Fine (2013), slow teenage readers and a pupil with Asperger's Syndrome were helped with comprehension using three visual thinking procedures. The students had to make their thinking real by drawing or writing their responses to questions given in each routine in the graphic organizers. Therefore, these visual thinking routines together with dialogic writing techniques scaffolded the teenagers' comprehension abilities and aided pupils with Asperger's Syndrome.

Mind mapping is another cognitive tool in which information is organized visually. According to Bahm (2013), technology-assisted mind mapping and concept mapping were used in science education. Although pupils from the traditional classroom understood science concepts equally well, pupils who were exposed to technology-assisted mind and concept mapping had positive views of the maps and found them useful and engaging.

In addition, an action research conducted by Al Naqbi (2010), revealed that mind mapping helped 11 EFL students in their brainstorming pre-writing strategy as they were able to produce flow of ideas, plan and organize these ideas to improve their writing skills. However, Hyerle (2004) states that "mind-mapping facilitates open minded-thinking but lacks the consistent structure and deeper levels of complexity required for today's classrooms" (p.7). He claimed that early mind mapping tools which surfaced in 1970's had some weaknesses. He advocates the use of i-think Maps in the classroom instead which he claims is "theoretically grounded in a fundamental cognitive process or thinking skills" (p. 7).

The use of graphic organizers to enhance English Language skills such as in reading and increasing comprehension has been mentioned in studies by Mede (2010), and Zakas, Browder, Ahlgrim-Deizell and Heafner (2013). Graphic organizers have also been used to aid pupils in their writing especially during pre-writing (Brown, 2011; Mundy and Coleman, 2012) and also improve writing skills among pupils who had writing difficulties (Sundeen, 2014; Norton, 2015).

According to a study by Gonzales-Ledo, Barbeta and Unzueta (2015), Year Four and Five boys with Specific Learning Disabilities (SLD) were helped with their writing using graphic organizers. Additionally, graphic organizers have also been useful for the teaching of science concepts (Ayverdi, Nakiboglu and Oz Aydin, 2013). Graphic organizers helped to enhance higher order thinking skills among teachers (Suarez, 2011) and also helped pupils acquire language skills in order to be autonomous learners (Pang, 2013). Nevertheless, Hyerle (2004) stressed that graphic organizers “help students organize large amount of information and scaffold learning but fail when they become static, backline masters focused on isolated content tasks selected by the teacher, rather than initiated by the learner” (p. 7). Hyerle (2004) also mentioned graphic organizers which were popular in the 1980’s had some shortcomings too and recommended the use of i-think Maps which are more suitable for the current classroom teaching and learning.

Another visual tool frequently used in the classroom is the concept map. Concept maps are diagrams to show relationships between concepts. It shows a main idea or concept which is then branched out into specific points. According to Pei-Lin Liu (2011), ninety four students in an English course used computerized concept maps during the planning stage of writing to improve their writing performance. They were exposed to three treatment lessons to complete three writing assignments

using concept maps. Although students from the high level group wrote better essays, the low and middle level pupils had benefited greatly in their writing from both computerized mapping treatments.

Hwang, Kuo, Chen and Ho (2013) also stated that concept mapping helped pupils' thinking abilities in sequencing of information retrieved from the web. The use of concept maps also enhanced pupils' abilities to solve problems using the web. In addition, an experimental study conducted by Hwang, Yang and Wang (2013) using concept map-embedded gaming approach was carried out. The pupils who were exposed to the concept-map gaming approach showed much improvement in their learning compared to the pupils who learned through the traditional game centered learning approach.

Bramwell-Lalor and Rainford (2014) also stated that concept mapping used in biology classes revealed that pupils applied higher-level thinking skills and improved in their comprehension of biology concepts. Nonetheless, Hyerle (2004) asserts that "concept maps are dependent on one form of visually structured knowledge and hierarchical forms which leads to an underrepresentation of other thinking processes" (p. 7). He deemed interpreting concept maps as "complex and daunting to students and teachers' alike" (p.7). Thus, the weaknesses of the above mentioned visual tools made the i-think Maps stand out and applicable to support teachers in mediating students' thinking.

Hyerle (2004) advocated the use of i-think Maps as a language tool which he claims as "consistent, flexible, developmental, integrative and reflective" (p.8). He also stressed that these "maps support the development of writing processes across disciplines and all grade levels from emergent writers to high school levels, by providing clear structures for organization (Hyerle, 2004, p. 15).

In a research by Lopez (2011) two elementary school teachers from an urban suburban school in Westchester County, New York utilized Thinking Maps as a cognitive tool on pupils for four years and they showed improvement in their language proficiency.

In addition, a study by Gallager (2011) on university students from Advanced Nutrition and Metabolism course exposed them to Thinking Maps for four semesters. The students' organization, clarity of writing and ability to summarize articles improved after Thinking Maps were taught.

To add to the above, according to Sunseri (2011), Thinking Maps were taught to seventy one fourth grade pupils in the South Bay School District in San Francisco to ascertain if their essays were more sequenced and logical. This study was carried out based on students' responses to a writing prompt after exposure to Thinking Maps. The qualitative findings showed that Thinking Maps and teacher's supervision aided pupils' writing proficiency.

Therefore, it is clear that i-think Maps are quality thinking tools that support pupils' thinking abilities in classrooms today as they instruct and provide a visual language for pupils to build their own network of knowledge especially in writing.

2.7 Chapter Summary

This chapter has presented the related literature to this study mainly the Cognitive Process Theory of Writing, i-think Maps, flow of ideas and writing performance. In the review of previous studies section, various researches by academicians were highlighted and looked into to shed light into the benefits of using visual tools namely i-think Maps to enhance the flow of ideas and writing performance of pupils. It is also aspired that this would lead them into the path of autonomous learning by expressing themselves more effectively in writing.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter describes the methodology employed in this study which includes the research design, population and sampling, research instruments, procedures for data collection and data analysis. The description of materials and activities to be used are also included to further explain about the methodology of this research in order to answer the following research questions:

1. How do i-think Maps help Year Five pupils' flow of ideas during writing?
2. Is there an impact in Year Five pupils' writing performance after using i-think Maps?

The data obtained will give an insight on the impact of using i-think Maps on the flow of ideas and writing performance of Year Five pupils of a National School in Kuala Lumpur.

3.2 Research Design

This study was carried out using a Pre Experimental: one group pre-test post-test design (Cohen, Manian and Morisson, 2007) involving a class of twenty eight Year Five pupils from a National School in Kuala Lumpur for three months namely March to May 2018. The one group pre-test and post-test design is made up of a pre-test, followed by an intervention, and then a post-test where the difference between O1 and O2 is explained by X namely: O1 X O2

According to Cohen, Manian and Morisson (2007), this experiment is repeatedly used by researchers because “it is simply not possible to investigate in random assignation of participants into control or experimental groups” (p. 282). It is also used to gauge the impact of an intervention after it had been implemented by educators (Shadish, Cook and Campbell, 2002). The pre- experimental: one group pre-test post-test design was chosen for this study because the researcher wanted to evaluate the effectiveness of i-think Maps on the flow of ideas and writing performance of Year Five pupils. The i-think Maps were used as an intervention to enhance the flow of ideas and writing performance of these pupils.

3.3 Population and Sampling

The population being investigated refers to the group of interest. Population refers to people or groups of people within certain institutions, societies, or activities (Cresswell, 2012). The population consisted of a hundred and twenty-one Year Five pupils of a National School in Kuala Lumpur.

According to Cresswell (2012), “a sample is a subgroup of the target population that the researcher plans to study for generalizing the target population” (p. 142). The research was carried out in a non-randomly chosen Year Five Ibnu Sina class which comprised twenty eight pupils. In this class, there were thirteen boys and fifteen girls respectively (see Figure 3.1).

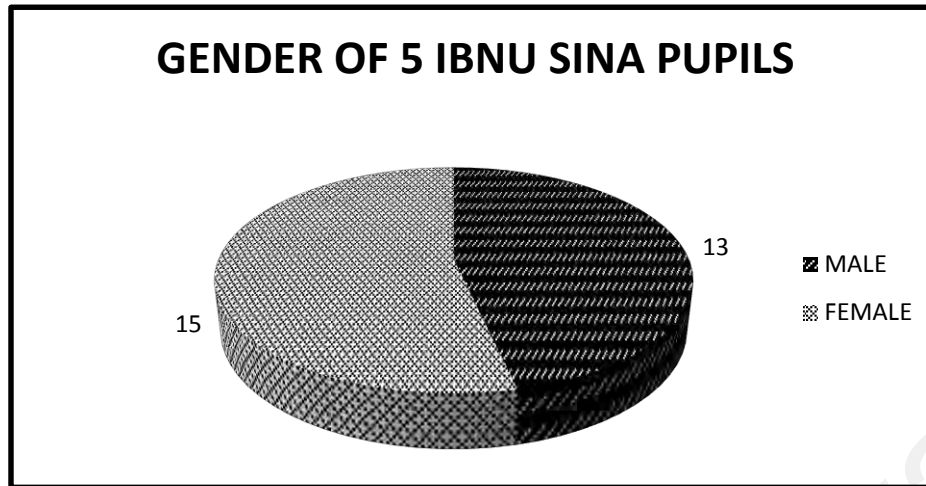


Figure 3.1 Gender of 5 Ibnu Sina pupils

A convenience sampling method was selected for this research. Convenience sampling method is an explicit sort of non-probability sampling method that is based on data collection from members of a population who are conveniently accessible (Creswell, 2012; Sural, 2018).

The following aspects contribute to the choice of sampling. Firstly, this school is the researcher's place of work. Moreover, this school had implemented the i-think Maps Program which emphasised the use of i-think Maps as a cognitive tool in accordance with the new policy introduced by the Ministry of Education, Malaysia. This program emphasised on higher order thinking skills (HOTS) through visual tools to improve the academic achievement of all Malaysian pupils.

Secondly, the pupils of this school have difficulties in English Language proficiency and more so in writing. The constant drop in the UPSR English Language examination results for the past five years (2013-2017) is testament to the need for more careful instruction on the part of English teachers to help these pupils in writing skills. The selected class of pupils' Year Four English Writing examination results in 2017 was used to categorize pupils for this study.

Thirdly, Suzie (pseudonym) who is currently teaching the Year Five pupils in the school is a colleague and more details about the pupils' background, their level of proficiency and other facts about the pupils and the school could be obtained easily. The participation of the English teacher was necessary to bring clarity on a number of issues obtained via structured interview questions which were designed to collect significant and substantial details of the teacher's experience with the i-think Maps to improve pupils' writing skills.

The English Language proficiency and achievement of pupils of the non-randomly chosen class was at an average and below average level. These pupils seldom enjoyed doing writing activities in their English Language classroom because they did not know what to write and needed help in using their cognitive skills in order to plan what to write and how to go about it. Moreover, they lacked competence in the language as most of them spoke their mother tongue (L1) at home. Nevertheless, the pupils were cooperative, teachable and willing to learn in order to develop their writing skills.

The researcher realized that the Year Five Ibnu Sina pupils selected for this study were a non-random group and therefore this study could not be generalized to the total population of Year Five pupils.

The researcher had obtained consent from parents/caregivers (Appendix J) as the pupils were minors and their identities were protected. From the bar graph shown below, the number of pupils who scored excellent results namely grades A (80 - 100) and B (65 – 79) were only two pupils respectively. However, many pupils scored borderline passes namely grade D (40 – 49) which consisted of 11 pupils whereas 12 pupils failed with grade E (0 – 39) in their writing exams.

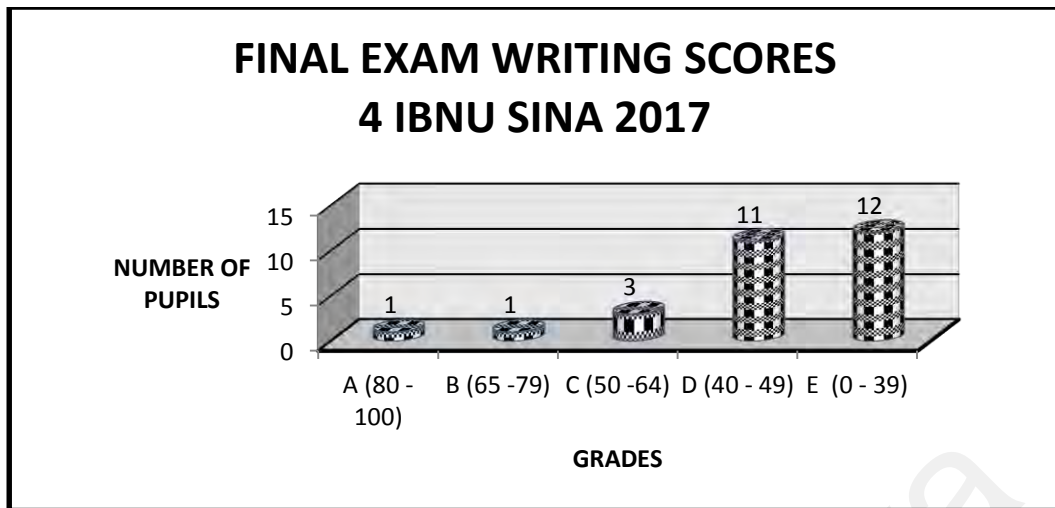


Figure 3.2 Final exam writing scores of 4 Ibnu Sina pupils in 2017

From the bar graph (Figure 3.2), we can see that the pupils from Five Ibnu Sina were in dire need to improve their writing skills as 42% of pupils failed in their English writing exams in Year Four while 39% of pupils obtained borderline passes only.

In order to help these pupils in their writing, the study on the impact of i-think Maps on the flow of ideas and writing performance was carried out.

Thinking Maps or i-think Maps facilitated pupils' thinking processes through activation of their long term memory or prior knowledge (Flower and Hayes, 1981; Gurlitt and Renkl, 2010). When pupils' prior knowledge is activated, they would be able to use their cognitive ability and organize their flow of ideas which would enable them to write effectively (Hyerle, 2000; Hayes and Berninger, 2014; Blaz, 2018). This skill needed to be channeled into the 5 Ibnu Sina English Language classroom to enhance pupils' flow of ideas and writing performance. Since the concept of i-think Maps was to help learners organize new information based on their long term memory or prior knowledge, they would be able to think critically and organize their ideas systematically in the planning or pre-writing stage (Asmawi,

2014 as cited in Balakrishnan et al, 2014) and slowly progress into the while-writing or drafting stage.

3.4 Instruments

In this study, the researcher used six types of instruments to collect data. They were:

- a. Pre-test and Post-test (Appendix A and A1)
- b. Classroom Observation Checklist (Appendix B)
- c. Structured interview questions for participant teacher and two pupils (Appendices C and D)
- d. i-think Maps Observation Checklist (Appendix F)
- e. Document analysis [i-think Map templates (Appendices G 1-5) and process approach written essays (Appendices H 1-5)]
- f. Pre-test essays (Appendices N1-N4)
- g. Post-test essays and Flow Map templates (Appendices O1-O4)

In addition, recordings of discussions and responses to structured and open-ended questions during the structured interviews with the Year Five English participant teacher and two randomly selected pupils were also gathered and transcribed as data (Appendices C and D).

3.4.1 Pre-test

In this test, the pupils were asked to write a guided narrative essay from Section C of the Year 5 English Midterm Writing Test paper (Appendix A) which carried 25 marks. They wrote the essay based on a given picture stimulus and 12 narrative prompts.

Narrative writing is a story which is connected with the events based on a developed plot. In addition, guided writing and sequences of pictures are considered as techniques which enhance pupils' writing skills (Carrel, 1984 as cited in Mariana,

Purnomo and Firdaus, 2018). Guided writing is the guidance provided by teachers by way of asking questions on pictures, word cues and essay prompts (Wright, 1990 as cited in Patel and Jain, 2008). Moreover, “sequences of pictures can be used to stimulate and guide pupils’ writing” (Wright, 1989, p. 201).

The UPSR English Writing paper was chosen to ensure trustworthiness and validity of the essay question as it was selected by the English Panel of the school where the study was carried out. Therefore, the validity and trustworthiness of the essay question was strictly ensured. Moreover, pupils were given forty five minutes to complete the writing task. They completed their task individually and upon completion, the essays were graded by the Year Five English participant teacher and the researcher using the UPSR Section C marking scheme (Appendix E). In order to ensure validity and trustworthiness of this experiment, the graded pre-test scripts were not returned to pupils to avoid familiarization, discussions and memorization of answers.

3.4.2 Intervention

In this study, an intervention comprising a cycle of five treatment lessons was carried out by the researcher to show causal relationship in the pre-experimental: one group pre-test post-test design. It was also used to determine the success of an intervention after it had been implemented by educators (Shadish, Cook and Campbell, 2002). Five treatment lessons were carried out throughout a span of ten weeks. The duration of each lesson was two weeks.

During Week one, the teacher introduced the Circle Map and explained its functions to pupils. She presented the essay topic “A Visit to the Bird Park” together with the narrative prompts. The pupils took part in a brainstorming session and worked in groups to discuss flow of ideas of the given essay topic. She also

prompted them with questions. Then, they filled in the Circle Map template and wrote their essays based on what they had planned. They handed in their completed essays and Circle Map templates to the teacher.

During week two, the teacher provided feedback on the essays pupils had written. They revised and edited their essays several times. They wrote the final version of their edited essays.

During week three, the teacher introduced the Bubble Map and its attributes to the pupils. Then, she presented the title of the essay, “Rafflesia” with the narrative prompts. They partook in brainstorming and group discussions. After that, they proceeded to fill in the Bubble Map template provided by the teacher. She facilitated them by prompting them with questions after which they wrote the essay entitled “Rafflesia”. They completed the essays and handed them to her together with the Bubble Map templates.

The following week, the teacher handed the essays which were corrected and provided feedback on each pupils’ essay. They edited and rewrote their essays.

In week five, the teacher refreshed pupils’ memory about the Circle Map. Then, she introduced the essay entitled “An Unforgettable Experience” to them. She explained the pictures and narrative prompts. They took part in the brainstorming session and group discussions after which they filled in the Circle Map template. She then guided them by prompting them with questions. They proceeded to write the essay. When they had completed, they handed them to her together with the Circle Map templates.

The following week, the corrected essays were handed to pupils. She also provided them with feedback. They then, edited and rewrote their essays.

During week seven, the Tree Map and its characteristics were introduced by the teacher. Then, she also presented the essay entitled “A Trip to Pulau Langkawi” together with pictures and narrative prompts. After she explained the pictures and narrative prompts, there was a brainstorming session followed by group discussions. She also used other prompts to facilitate pupils. They then proceeded to fill in the Tree Map after which they wrote their essays. After completion, they handed their essays and Tree Map templates to her.

In week eight, the corrected essays were returned to them and feedback was provided by the teacher. They revised, edited and rewrote their essays.

During week nine, the teacher introduced the Flow Map and explained its functions to the pupils. She also presented the essay entitled, “Thiba’s Birthday Party” to them. After they looked at the pictures and narrative prompts in the task sheets, they clarified the meanings of difficult words with her. Then, they took part in a brainstorming session and group discussions after which they filled in the Flow Map templates. As the teacher moved around the classroom, she prompted them with questions to guide them in planning their pre-writing. Next, they wrote their essays based on the Flow Maps they had filled. When they had completed their essays, they handed them to her along with the Flow Map templates.

During the final week, the teacher provided feedback after she handed the corrected essays to the pupils. They edited and rewrote the final draft of their essays.

These steps were carried out throughout the whole intervention cycle using four different i-think Maps and five essay topics (see Appendices I 1-10).

3.4.3 Post-test

The researcher conducted the post-test using the guided narrative essay question from Section C of the Year Five Final English Writing paper (Appendix

A1) after an intervention consisting of five treatment lessons using i-think Maps for ten weeks. The pupils were given the task sheet containing a picture stimulus and nine narrative prompts to complete an essay within forty five minutes. They were also provided with a choice of two i-think Map templates (Appendix M) namely the Circle Map and Flow Map which they had to choose to write down their flow of ideas.

Most of the pupils chose the Flow Map template because it is “used for sequencing a story plot by stages and sub-stages, analyzing and prioritizing important events, and sequencing paragraphs for writing” (Hyerle, Alper and Curtis, 2014, p.6). This was to ascertain if they knew which template was more suitable for them to record their flow of ideas. They then used the appropriate i-think Maps template of their choice as a point of reference to complete their post-test essays.

The pupils wrote their flow of ideas onto the template and constantly referred to it as they began to write their post-test essay. During the post-test, no discussions among them were allowed and there was no guidance provided by the participant teacher. After completing the writing task, the essays and i-think Maps templates were collected and graded by the Year Five English participant teacher and the researcher using the UPSR Section C marking scheme (Appendix E).

Pupils’ essays were graded according to bands namely in the Excellent, Good, Satisfactory and Weak categories. The Excellent band was achieved through scores of 21 – 25 marks. Essays in the Excellent category should display an excellent use of language with ideas conveyed clearly through a variety of sentence structures. Ideas should be well-planned, organized and logically linked with accuracy in spelling and punctuation.

Essays from the Good category have scores from 13 – 20 marks. These essays should portray a proficient use of language throughout with attempts by pupils to construct a variety of sentences with allowance for occasional errors. Most of the ideas should be well organized, relevant and conveyed clearly. Even though, punctuation and spelling errors occur occasionally, the overall meaning must be clear.

The next is the Satisfactory category with scores ranging from 7 – 12 marks where the sentences are simple with minor mistakes, but, the meaning is still clear. Here, the narrative prompts are used correctly with a satisfactory presentation of ideas. However, a few punctuation and spelling errors may be found in the script.

The final category is the Weak category with scores ranging from 1 – 6 marks due to poor use of the language with multiple errors and incorrect use of vocabulary too. Ideas are incomprehensible and there are direct lifting and chunking of words which make the meaning unclear.

In addition, the completed i-think Maps templates (Appendices O1-4) were also analyzed to ascertain and gauge pupils' flow of ideas during the post-test.

3.4.4 Structured Interview

The researcher conducted a structured interview (Appendices C and D) as one of the primary sources of data collection. The participants were the Year Five English participant teacher and two randomly selected pupils in order to gather information regarding their perception of using the i-think Maps in enhancing pupils' flow of ideas and writing performance. The selection of pupils for the interview session was carried out by casting lots and two names were picked randomly to avoid biasness, favouritism and to ensure reliability (Cresswell, 2012). Both pupils were interviewed simultaneously due to time constraint. The students answered the

interview questions in Bahasa Melayu and English interchangeably as they were not confident to use English Language entirely throughout the interview. Therefore, the transcribed responses of the structured interview were literal translation from Bahasa Melayu to English. Consent forms were given to both the participant teacher (Appendix K) and pupils (Appendix J) to conform to research ethics (Creswell, 2012). Consent forms were addressed to the pupils' parents for their consent as they were minors (Smith, 2013). Clear explanations regarding the objectives of this study were given to the interviewees in accordance to the interview protocol (Jacob and Furgeson, 2012).

The English participant teacher was interviewed to gather data regarding her experience in using i-think Maps in teaching writing among the Year Five pupils. The interviews were recorded and transcribed in full before being analyzed. All participants' names were substituted with pseudonyms. The analysis followed procedures suggested by Coffey and Atkinson (1996). The reliability of the analysis was tested through a member check procedure (Merriam and Tisdell, 2015). Two pupils were asked to give remarks and feedback regarding the transcribed translation and interpretation of the interview draft.

3.4.5 Observation Checklists

The subjects of this study were observed during the intervention by their English participant teacher and researcher to gauge their flow of ideas during brainstorming sessions and group discussions. Pupils then proceeded to fill in the i-think Maps templates to plan their writing. Their ability to use the i-think Maps as cognitive tools during their writing process as they drafted and edited their work (Flower and Hayes, 1981) was observed based on a Classroom Observation

Checklist (Appendix B). This checklist was adapted from the Thinking Foundation (2001) to ensure validity and trustworthiness.

In order to check pupils' ability to complete the i-think Maps templates, the i-think Maps Checklist (Appendix F) was used. Thus, two checklists were used per week to monitor their flow of ideas while using i-think Maps templates and their impact on pupils' writing performance.

However, the researcher acknowledges that there are validity issues using checklists during group discussions as not all pupils tend to be active participants in their respective groups (Cohen, Manian and Morisson, 2007).

3.4.6 Document Analysis

Document analysis involves a systematic checking carried out on printed documents and electronic sources. Document analysis involves studying the data and deducing it to extract meaning, enhance knowledge and build experimental understanding in qualitative research (Corbin and Strauss, 2008; Bowen, 2009). In this study, pupils' i-think Maps templates (Appendices G 1-5) and written essays (Appendices H 1-5; N 1-4; O 1-4) were analyzed during the intervention consisting of five treatment lessons as an evaluation of pupils' flow of ideas and writing performance.

In addition, pupils' flow of ideas which they wrote in the i-think Maps templates during the post-test were analyzed to see if their flow of ideas and writing performance improved after using i-think Maps during writing (Appendices O 1-4).

3.5 Inter-Rater Reliability

Inter-rater reliability is achieved when data are independently coded and the codes are compared for agreement (Gwet, 2014). During the first stage of this pre-

experimental: one group pre-test post-test design, a pre-test on writing was administered on Year Five Ibnu Sina pupils. The essay scripts were rated by both the Year Five English participant teacher and the researcher to ensure inter-rater reliability and validity. After an intervention of five treatment lessons for ten weeks, the post-test was administered. The same procedure was used to rate the scores of the pupils' written scripts to ensure consistency and accuracy in rating the scripts (Fei, Aziz and Ming, 2011).

In this study, four sources of data collection were used to ensure the validity and reliability of data collected from various sources (Bodgan and Biklen, 2007). Trustworthiness of this study is ensured through the four procedures of data collection to generate the findings (Graneheim and Lundman, 2003). A researcher required various sources of data to sustain scientific accuracy within the data collection (Bodgan and Biklen, 2007). The researcher also used triangulation to comprehend the subjects' remarks during the structured interviews and observed pupils' conduct in authentic situations (Creswell, 2012; McDonough and McDonough, 2014).

3.6 Data Collection Procedure

This study used quantitative and qualitative methods for data collection. According to Creswell (2012), "this process involves two data collection methods that proceed simultaneously and are related to each other" (p. 550).

Since this study was carried out in a National School in Kuala Lumpur, the researcher met the school's Headmaster to obtain his permission to carry out the research (Appendix L) and at the same time brief him about the research that would be carried out.

During the session with the Headmaster, the aim, purpose and strategies to be used were clearly explained. The Head of the English Panel and the English participant teacher were also informed about the research by the researcher. The researcher also met the Year 5 Ibnu Sina pupils who were involved in the study to explain the objectives and purpose of the research.

First, a pre-test (Appendix A) was administered to all pupils in the experimental group. Then, the experimental group was given an intervention which comprised of five treatment lessons (Appendices I 1-5) for ten weeks using the i-think Maps namely the circle, bubble, tree and flow maps to help their flow of ideas and improve their writing performance.

The duration of the writing lessons using each map was two weeks. During the first week, the researcher introduced the i-think Maps after which the topic for writing was given. Pupils took part in brainstorming sessions and worked in groups to complete the i-think Maps templates during the planning stage. They used the templates as referral points to draft their essays. During the following week, they worked on correcting their essays based on feedback they received from the teacher.

Moreover, four i-think Maps were used in this intervention because the new UPSR English writing format had used these i-think Maps extensively and writing practice using these maps would benefit the pupils.

After the intervention was carried out for ten consecutive weeks, the post-test (Appendix A1) was administered. Data was gathered based on the pre-test and post-test scores administered on the non-random group. The basic principle behind the pre-experimental: one group pre-test–post-test design involved acquiring a pre-test measure before conducting an intervention, followed by a post-test on the same measure after intervention (Salkind, 2010).

The Paired Samples t-Test was used to compare and contrast two mean scores from similar individuals or related units. The two means were obtained at two differing times, namely a pre-test followed by a treatment and then a post-test. The tests were carried out to ascertain if there was statistical evidence of mean differences between paired observations on a particular outcome that was significantly different from zero (Chua, 2013).

Pupils' flow of ideas during writing using i-think Maps was observed using a Classroom Observation Checklist (Appendix B) and i-think Maps Checklist (Appendix F) by their Year Five English participant teacher and the researcher. In addition, structured interviews (Appendices C and D) were carried out on the current English Language participant teacher and two randomly selected Year Five pupils (Ammar and Asha, pseudonyms). Moreover, i-think Maps templates and pupils' written essay during the intervention, pre-test and post-test were used as document analysis to gauge their flow of ideas and writing performance.

This type of qualitative method using observation checklists and structured interviews was intended to locate concepts that explain the relationship of the independent variable (in this case, i-think Maps) with dependent variables (in this case, flow of ideas and writing performance).

Data collection activities took place during a three month period from March – May 2018. After the subjects of the study were confirmed, the researcher drew up a timeline so that the interview process, observations, document analysis, transcription, and data verification could be carried out in an orderly manner to meet research deadlines. The description of the data collection procedure is shown in Table 3.1.

Table 3.1

Data Collection Procedure

Steps	Description	Method
1.	A writing pre-test was administered on non-randomly selected pupils in the pre-experimental: one group pre-test post-test design.	Quantitative
2.	An intervention of five treatment lessons were carried out using i-think Maps. Weeks 1 & 2 – Circle Map Weeks 3 & 4 – Bubble Map Weeks 5 & 6 – Circle Map Weeks 7 & 8 – Tree Map Weeks 9 & 10 – Flow Map Pupils' flow of ideas using i-think Maps during writing was observed using two checklists.	Qualitative
3.	A writing post-test was administered and scores analyzed using SPSS.	Quantitative
4.	A structured interview with: <ul style="list-style-type: none"> • Year Five English participant teacher • Two randomly selected pupils 	Qualitative

3.7 Data Analysis

Firstly, quantitative methods contributed data to gauge the statistical impact of i-think Maps on the flow of ideas and writing performance of Year Five Ibnu Sina pupils. Quantitative data collection tools consisted of writing pre-test and post-test scores.

The researcher ensured that the pupils completed the pre-test and post-test of essay writing. The essays were rated by the Year Five English teacher participant and researcher to analyze the data quantitatively. The processes of data analysis were as follows:

- Measurement of Central Tendency was used to describe the achievement of the pupils in the pre-test and post-test.
- Paired-samples t-Test was used to determine if there was a difference between the means of both sets of data obtained from the pre-test and post-test scores (Gravetter and Wallnau, 2008).

The difference between quantitative and qualitative research is the researcher in a quantitative research plays the role of a passive observer who does not partake nor is influenced by what is being researched. On the contrary, in a qualitative research, the researcher partakes in the investigation and interprets the findings according to real life representations. (Winter 2000; Moon et al, 2016).

Secondly, qualitative research was heavily weighted towards the discussions and interpretation of the analyzed data. Through qualitative methods, the researcher attempted to establish explicit factors impacting flow of ideas using i-think Maps.

The four qualitative methods used in the study include:

- i) Two checklists namely the Classroom Observation Checklist (Appendix B) and i-think Maps Checklist (Appendix F);
- ii) Structured interview with the participant teacher (Appendix C);
- iii) Structured interview with two randomly selected pupils (Appendix D);
- iv) Document Analysis of pupils' work namely i-Think Maps templates (Appendices G 1-5) and written essays (Appendices H 1-5, N 1-4; O1-4).

The Year Five English participant teacher and two randomly selected pupils answered a structured interview which was recorded. Apart from that, pupils' flow of ideas using i-think Maps was observed using checklists and their written essays were analyzed.

According to Creswell (2012), the findings in qualitative methodology need to be validated “to determine the accuracy and credibility of the findings” (p. 259). The application of this research method provided a ‘narrative’ about how this cognitive tool impacts the flow of ideas and writing performance in English Language. Since this research reports both quantitatively and qualitatively, the position of the researcher differs between the two research methods (Creswell, 2013).

According to Burnard, Gill, Stewart, Treasure, and Chadwick (2008), qualitative data such as observation checklists, interview transcripts and field notes only describe the study, but they do not provide explanations. Therefore, it is the duty of the researcher to interpret the data to understand it clearly.

The process of thematic content analysis involves identifying themes and categories that “emerge from the data” (Castlebury and Nolen, 2018). These themes were verified and confirmed after looking through the data repeatedly to further identify the suitability of the categories and themes.

To begin the qualitative analysis, theme identification had to be undertaken as the first step. In order to identify themes, the data collected during this study had to be carefully scrutinized since the primary task in qualitative research is identifying the theme (Ryan and Bernard, 2003; Thurman 2018). Key terms, repetitive and contextual words from simple observations enabled the researcher to understand what people were talking about. In qualitative research, thematic content analysis included analysing interview transcripts, document analysis and recognizing themes within the data (Castlebury and Nolen, 2018).

After analyzing all the data, the main themes that emerged in enhancing the flow of ideas and writing performance of the Year Five pupils were determined by the researcher.

Moreover, there were two important methods of analyzing data which is respondent validation (or member check) where study participants were given the data and asked to validate the analysis (Creswell, 2012, p.259). The second is inter-rater reliability or peer analysis where another qualitative researcher reviews the data independently (Burnard, Gill, Stewart, Treasure and Chadwick, 2008). These procedures which were carried out to answer the research questions are shown in Table 3.2.

Table 3.2

Procedures for answering Research Questions

	RESEARCH QUESTIONS	PROCEDURES	ANALYSIS
1.	How do i-Think Maps help Year Five pupils' flow of ideas during writing?	1. Two Observation Checklists 2. Pupils' i-think Maps templates and essays (document analysis) 3. Structured Interview with participant teacher and two pupils	Narrative inquiry with description and interpretation
2.	Is there an impact in Year Five pupils' writing performance after using i-think Maps?	1. Pre-test and Post-test 2. Pupils' i-think Maps templates and essays (document analysis) 3. Structured Interview with participant teacher and two pupils	Comparison of mean and frequency analysis Narrative inquiry with description and interpretation

3.8 Trustworthiness of the Study

According to Brit et al (2016), high quality research is determined by the trustworthiness of its results. Since this research used both quantitative and qualitative methods, the trustworthiness of the study for these methods differs. The quantitative method's trustworthiness includes internal and external validity.

3.9 Internal Validity

Validity concerns are pertinent in one group pre-test post-test design because this research design raises questions regarding validity as it does not have similar measures of control over variables as the true experimental design (Campbell and Stanley, 2015).

Internal validity refers to the validity of the findings within the research study. It focuses on limiting the extraneous variables and external effects that may influence the outcome. According to Campbell and Stanley (2015), internal validity is important in pre-experimental studies that try to establish causation to ensure that the experimental intervention (Y) is responsible for a modification in the dependent variable (Z).

Moreover, since the pre-experimental: one group pre-test post-test study needs to determine a causal relationship, internal validity is very crucial and vital to ensure the findings are valid and reliable (Kourea and Lo, 2016). Therefore, the researcher must plan to limit or eliminate the influence of other variables in order to be certain when making conclusions about the relationship between Y and Z. This is considerably more difficult in a pre-experimental: one group pre-test and post-test study primarily because participants are non-randomly selected. Therefore, it is more difficult to control the extraneous variables that may influence the findings of the study.

According to Sullivan-Bolyai and Bova (2014), one group pre-test post-test design is used by researchers because it is impossible to randomly assign students into the experiment group especially in a school. In this study, randomization was impossible as the Year Five pupils were already assigned to classes and it was difficult to randomly pick pupils for this study as it would interrupt the class

timetable and teaching schedules. Moreover, since these pupils are from primary school, it was difficult for them to remain in school after school hours due to safety reasons. Therefore, the researcher had no other option but to choose a class of Year Five pupils as they were not streamed according to their academic achievements. Moreover, the pupils from these classes were average and below average in their English Language proficiency.

Another disadvantage of this pre experimental: one group pre-test post-test study is that it was carried out without a control group. The addition of a control group would establish more validity in this experiment especially in making comparisons between both groups. Therefore, validity threats in this design does exist which need to be acknowledged and addressed (Campbell and Stanley, 2015).

3.9.1 Internal Validity Issues and Measures Taken

Whenever there are aspects that can influence the data or the generalizability of the findings, they are called threats to validity. However, not using the 'purest' of one group pre-test post-test design does not decrease the value of the study even though it may decrease the strength of the findings (Sullivan-Bolyai and Bova, 2014).

The first issue is history, whereby, between pre-test O_1 and post-test O_2 many events may have occurred apart from the intervention lessons X to produce the difference in outcomes. The lengthier the time frame between O_1 and O_2 , the more probable history becomes a risk. Since this study was carried out for ten weeks which was a long time lapse, the researcher acknowledges that extraneous variables such as pupils' self-motivation, parental or older sibling's guidance at home and tuition classes in these ten weeks may have helped the Five Ibnu Sina pupils' writing scores in the post-test.

Secondly, is the issue of maturation as pupils may mature in age or internal conditions may have altered between O_1 and O_2 . Therefore, the differences obtained could be attributed to these alterations and not the intervention, X . Although the pupils from Five Ibnu Sina were not streamed and their level of English Language proficiency is average or below average, there may have been room for maturation, personal development or self- motivation towards writing in English since many of them have difficulties in writing. As such, they might have tried to improve themselves in writing through tuition or self-study.

Thirdly, testing is another important issue as the effect of giving the pre-test itself may affect the outcome of the post-test. It has been acknowledged that the process of assessing may alter that which is being assessed. It is also known that instead of a passive documentation of conduct, the reactive effect causes a true change in conduct. In order to address this issue, section C of the UPSR English Midterm Writing test paper was used for the pre-test. Another similar question which is also from Section C of the UPSR English final term test paper was used for the post-test to avoid biasness and maintain trustworthiness of the test. Moreover, pupils were indifferent to both the tests as these tests were not summative exams conducted by the school. The pretest and post-test questions were different but similar in their formats. The format of the writing paper from Section C of the UPSR test paper was used consistently to avoid biasness and to ensure that the weighting and type of question were similar but not exactly the same .

The fourth issue is selection, because the outcome of the research will be biased if the subjects are chosen in a non-random manner or are functionally inequivalent at the beginning of the study. The researcher acknowledges that this issue cannot be addressed as pupils were already grouped in classes and it is

impossible to select them randomly. However, there was no streaming when pupils were grouped into Year Five classes and the researcher contends that this is an added advantage to address validity issues.

The next issue deals with experimental mortality, whereby, the number of subjects that do not participate in the test due to reasons such as illness or lack of motivation can affect the outcome of the study. However, no pupil dropped out during the entire study period. Therefore, it reduced the threat to internal validity and ensured that experimental mortality did not occur.

Finally, the last issue involves selection interaction, whereby, the selection technique may relate with one or more of the other threats and influence the results. For example, groups with larger numbers of elderly participants may be more affected by maturation during the study. The Five Ibnu Sina pupils were selected non-randomly from the same age group and had difficulties in writing. Therefore, the researcher acknowledges that parental guidance, tuition classes and older siblings' assistance may have contributed to pupils' improvement in their writing performance and are therefore beyond the researcher's control.

3.9.2 External validity

External validity refers to the degree of "our ability to draw correct inferences from the sample data to other persons, settings, treatment, variables, and measures" (Creswell, 2012, p. 306). External validity is related to genuine life relevance outside the restrictions of the experiment. In true experimental studies, the random selection of participants ensures that the subjects of the research are truly a representative of the larger population (Mac Dermott, 2011).

Random selection is truly the key guaranteeing that outcomes are generalizable. One group pre-test post-test studies pose disputes because participants

are not randomly selected (Sullivan-Bolyai and Bova, 2014). The greatest proof for external validity is when the research findings can be replicated with other populations, time periods or situations. Researchers should keep replication in mind when planning the study to ensure external validity.

In this study, although the chosen Year Five Ibnu Sina pupils were not streamed according to their academic achievements, external validity issues could not be fully and effectively addressed due to the existence of extraneous variables. Thus, the findings of this study are valid and relevant for Five Ibnu Sina pupils only and cannot be generalized for the whole Year 5 population.

3.10 Trustworthiness in Qualitative Data

In order to ensure trustworthiness of the qualitative aspect of this study, it is important that the study's findings are credible, transferable, confirmable, and dependable.

3.10.1 Credibility

In order for the findings of this study to be true and accurate, triangulation was carried out in this study. Triangulation refers to collecting information about various sources and relationships from different points of view (Cohen, Manion and Morrison, 2007). According to Cresswell (2012), the credibility of the data obtained from the participants needs to be triangulated with various methods and examined with past findings. He also added that in order to improve reliability of a study when the sample size is small, triangulation is very important. Therefore, in this present study, the data collected from the structured interviews of two pupils and the participant teacher together with the document analysis of i-think map templates and essays were triangulated to ensure that this study is credible.

3.10.2 Dependability

Dependability refers to the fact that when the same study is replicated, similar results would be achieved and evidence must be provided that when the study is repeated with similar respondents in the same context, the findings would be also be repeated. In other words, it refers to the consistency of the process and product of the study (Cohen, Manion and Morrison, 2007). This study can be replicated because only one experimental group without randomization was selected and, therefore, other studies can be carried out using two groups with randomization.

3.10.3 Confirmability

Confirmability refers to the extent that the findings of the study is neutral and based solely on participants' replies without any potential bias or personal motivation of the researcher. It is, therefore, pertinent that the researcher's biasness does not interfere with the interpretation of what the participants said to fit a certain narrative. In order to ascertain confirmability, the researcher has provided details of the data collection process and the development of themes. Moreover, the pupils' essays were strictly graded using the marking scheme guidelines provided by the Lembaga Peperiksaan Malaysia so as to ensure confirmability of the study.

3.10.4 Researcher's Bias

In order to avoid researcher's biasness, two pupils were selected randomly for the interview by casting lots. This was to ensure that each pupil had an equal chance of being selected for the interview without favouritism. In addition, the chosen Year Five class was unfamiliar to the researcher as she does not teach Year Five pupils. As such, there was no chance for the researcher to make any personal judgment or assumption about the pupils during the interview. Moreover, there was no emotional attachment to the pupils as they were unfamiliar to her.

3.11 Ethical Considerations

In this study, ethical considerations were based on guidelines and principles stipulated by University Malaya's specifications. These considerations included anonymity, confidentiality, informed consent and risk minimisation on participants of this study.

3.11.1 Anonymity and Confidentiality

According to Cohen, Manion and Morisson (2007), "a participant or subject is therefore considered anonymous when the researcher or another person cannot identify the participant or subject from the information provided" (p. 4). Anonymity is important to participants as it allows their interests to be protected as they provide their perspectives and experiences regarding the study. In order to accomplish this, pseudonyms were used to safeguard their identities.

According to the principles of literature, confidentiality is generally considered as the ethics of privacy (Oliver and Gregory, 2003). In other words, individual views matter and individuals have the right for their thoughts, ideas or beliefs to be confidential. Therefore in order to ensure the participants' confidentiality, what has been discussed with the academic supervisor was not revealed without the participants' permission.

3.11.2 Informed consent and minimisation of risk

Consent letters were issued to the headmaster, parents of pupils and participant teacher to obtain permission to conduct the study in the school. The researcher also met with the pupils and participant teacher to explain the study, its purpose, methods employed and data collection processes.

In order to minimize risk, participants needed to be protected against injury or invasion of their privacy and preservation of their dignity. Moreover, identities of

individual participants were not revealed without the consent of the participants. The researcher also clarified that she would not pass judgments on the pupils' personal views, values and writing achievements. Participants were free to discontinue or withdraw from the study if they were uncomfortable or embarrassed in any way throughout the study.

3.12 Chapter Summary

This chapter explains the methodology which was employed in this present study which is the research design, population and sample, research instruments and procedures for data collection and analysis. It was expected that the data obtained would allow the researcher to find out the impact of using i-think Maps on the flow of ideas and writing performance of Year Five pupils, which the researcher considered as an innovative method to further enhance the teaching of writing in the Malaysian English Language classroom.

CHAPTER 4

FINDINGS

4.1 Introduction

As described in Chapter 1, this study examines the impact of i-think Maps on the flow of ideas and writing performance of Year Five pupils. It was carried out using a pre experimental: one group pretest post-test design involving a class of twenty eight Year Five pupils from a National School in Kuala Lumpur for a period of three months namely March until May 2018. The pre experimental: one group pretest post-test design was chosen because it was the purpose of this study to determine the impact of the intervention of i-think Maps on the flow of ideas and writing performance of Year Five pupils. For the purpose of confidentiality, the school has been identified as the National School in the Keramat Zone.

The school was selected based on two specific criteria. Firstly, the pupils being second language learners of English (ESL) have difficulties in English Language proficiency, particularly in writing. The constant drop in the UPSR English Language results of this school for the past five years (2013-2017) in English Language is testament to the need for more careful instruction on the part of English teachers to help these pupils in their writing skills.

Secondly, the participant teacher in this study is the researcher's colleague and also the current Year Five English Language teacher who had received training in using i-think Maps. Therefore, the participant teacher is knowledgeable about the benefits of i-think Maps as a cognitive tool in writing.

This chapter provides a description of the findings and analysis of the data collected regarding the impact of i-think Maps on the flow of ideas and writing performance of Year Five pupils, which forms the core of this study. This study had attempted to answer two research questions which are:

1. How do i-think Maps help Year Five pupils' flow of ideas during writing?
2. Is there an impact in Year Five pupils' writing performance after using i-think Maps?

4.2 Research Question 1: How do i-think Maps help Year Five pupils' flow of ideas during writing?

In order to answer Research Question 1, qualitative data collection methods were employed to provide insight into the thoughts and feelings of Year Five pupils and their English participant teacher with regards to the impact of i-think Maps on the flow of ideas and writing performance.

The qualitative instruments also yielded important data and information regarding pupils' writing performance which related to the quantitative Research Question 2. Therefore, the qualitative data findings were used to discuss Research Question 2 regarding the extent of improvement in the pupils' writing performance.

4.2.1 Emerging Themes

In this study, an intervention through five treatment lessons (Appendices I1-5) was carried out using i-think Maps to gauge the impact of these i-think Maps on the flow of ideas and writing performance of Year Five Ibnu Sina pupils. Both the participant teacher and researcher used two Checklists (Appendices B and F) per week during ten weeks to gauge pupils' flow of ideas while using i-think Maps templates and their impact on their writing performance.

Analysis of the observation checklists (Appendices B and F) presented three themes that contributed towards the flow of ideas and writing performance of pupils in Year Five Ibnu Sina. In qualitative research, theme identification is a very important and vital tool that enables the researcher to discover layers of information from the data (Ryan and Bernard, 2003, Thurman, 2018). Moreover, thematic content analysis includes analysing interview transcripts, recognizing themes in the data and identifying examples of themes found in the text. Key terms, repetitive and contextual words identified from interview transcripts, document analysis and observations help the researcher make sense of what the pupils and participant teacher were talking about. The roles portrayed by i-think Maps, pupils and teachers were used to answer Research Question 1 on how i-think Maps helped pupils' flow of ideas.

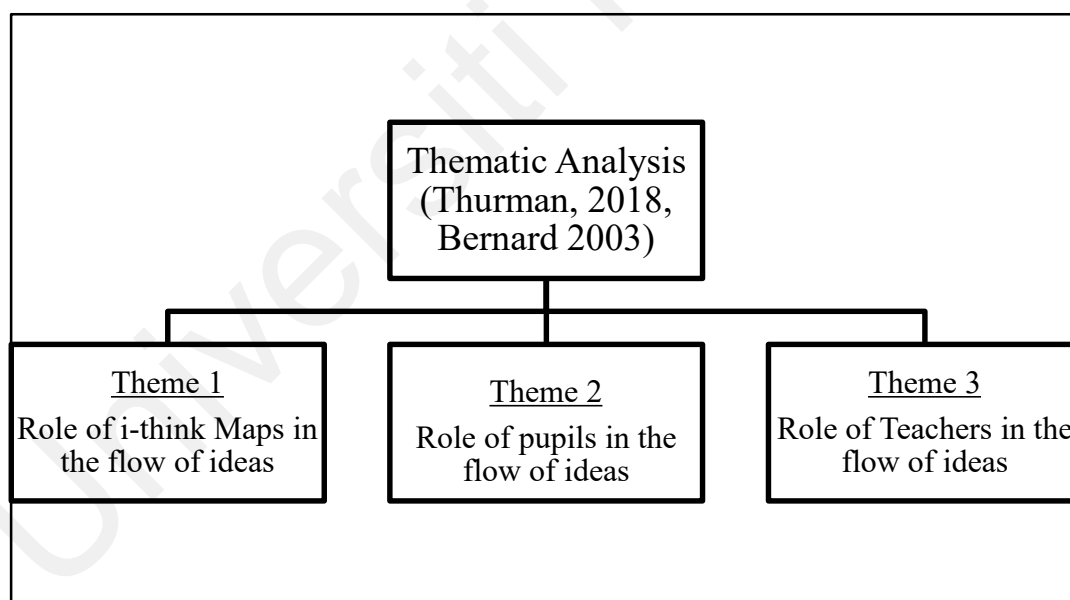


Figure 4.1 Thematic Analysis

4.2.2 Theme 1 – Role of i-think Maps in the flow of ideas

The first theme is the role of i-think Maps as they are the cognitive tools that are used for this study. The i-think Maps are visual platforms which are “used as a cognitive structure to expand and integrate with words” (Hyerle and Alper, 2011, p

12) thus enhancing writing proficiency. According Hyerle and Alper (2011), i-think Maps “support the writing process from ideas generated into the final product” (p. 73). In this study, pupils used four i-think Maps to capture their flow of ideas and organize them sequentially in the i-think Maps templates.

Table 4.1

Role of i-think Maps in the Flow of Ideas

ITEMS	CHECKLIST	N
1A	i-think Maps are student generated	10
1B	i-think Maps transfer pupils’ flow of ideas in the planning/drafting/editing stages	10
1C	Frame of reference utilized.	5
1D	There is evidence of use of the following i-think Maps: i) circle map ii) bubble map iii) tree map iv) flow map	10
1E	Pupils can explain why they use the i-think Maps	6
1F	Pupils know how to use the maps for stages of the writing process: describing, classifying, elaborating details, sequencing	7
1G	Pupils generate ideas as they work in pairs and/or small groups with the aid of i-think Maps.	9
1H	Pupils know how to use the four i-think Maps	7

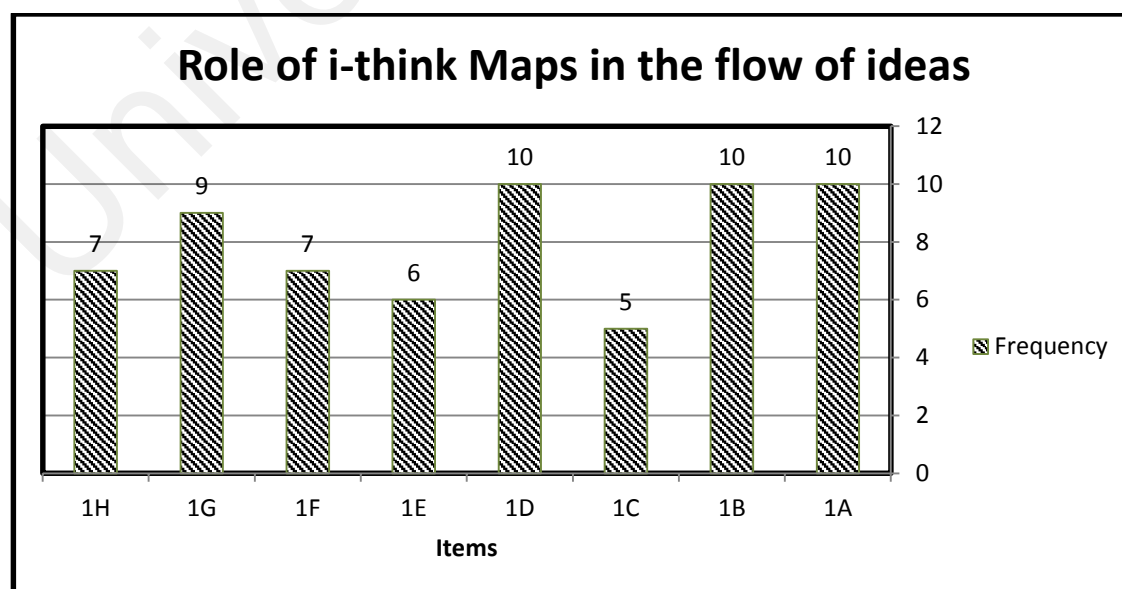


Figure 4.2 Role of i-think Maps in the Flow of Ideas

As stated by Hyerle (2001), pupils can record their flow of ideas sequentially and coherently in i-think Maps so that they can compose well-presented essays based on their long term memory.

In observing Table 4.1, some items were most frequently carried out. One of them is i-think Maps were generated by pupils. Therefore, they were able to transfer their flow of ideas from the i-think Maps templates during the planning stage and use them while drafting and editing their essays. There were evidences of four i-think Maps namely circle Maps, bubble Maps, flow Maps and tree Maps which were utilized during treatment lessons (Appendices G1-G5) and post-test (Appendices O1–O4). These maps provide columns for pupils to jot down their ideas. In other words, these columns make it compulsory for pupils to think, discuss and fill them with their flow of ideas for the essay writing. In addition, content-specific writing tasks related to the essay topics were given to them (Refer to lesson plans shown in Appendices I1-I5).

In pupils' use of i-think Maps in writing, the second most frequent task was they generated ideas while discussing in small groups. They wrote down their flow of ideas in the correct sequence into the templates after group discussions and brainstorming sessions. Thereafter, those who had completed their i-think Maps templates, referred to them frequently as a point of reference as they completed their writing tasks.

Pupils also understood the use of i-think Maps for different stages of the writing process such as describing, categorizing, expanding supporting details and sequencing. Moreover, they also demonstrated knowledge that they comprehended the use of various i-think Maps for different kinds of texts (Hyerle, 2004). They could also explain the reason they selected and used specific i-think Maps.

The structured interview questions stimulated the two pupils'/interviewees' responses regarding their flow of ideas in the planning stage and during the writing process. In addition, the questions led to pupils' precise responses of their usage of the i-think Maps for their flow of ideas. The teacher participant was also interviewed to gauge the factors that impacted pupils' flow of ideas.

Teacher : *Do i-think Maps help you to get ideas for writing?*

Asha : *Yes teacher.*

Ammar : *Yes, help me a lot.*

Asha : *i-think Map activities helped me a lot by getting ideas on my writing.*

Ammar : *Using i-think Maps you could easily get a lot of idea.*

(Excerpt 1, Asha and Ammar : lines 38 - 39 and 46 - 47, 25 June 2018)

From the excerpt above, the use of i-think Maps helped pupils in their flow of ideas during the planning stage after which they completed the i-think Maps templates. Their replies suggested that the i-think Maps were needful for them to capture and sequence their thoughts correctly as they planned what to write (Hyerle, 2000). Since process writing is "a set of distinctive thinking processes" (Flower and Hayes, 1981, p. 366), the i-think Maps aided pupils' thinking processes in order to obtain a flow of ideas.

Suzie : *The i-think Maps helped pupils generate ideas after brainstorming sessions, thus they were actively involved in filling the i-think Maps templates.*

(Excerpt 2, Suzie: lines 38 -40, 2 July, 2018)

From Excerpt 2, it is evident that pupils needed to be focused and involved in using the i-think Maps to sequence their flow of ideas. This is because after the brainstorming sessions, they were able to align their thoughts sequentially and write

them down in the i-think Maps templates (Hyerle, 1995). According to Flower and Hayes (1981), pupils' "network of goals" (p.366) expands as they plan their composition and write their flow of ideas in i-think Map templates.

During the post test, a picture stimulus with nine writing prompts was given to the pupils (see Figure 4.3). They took part in brainstorming and group discussions to expand these nine words into flow of ideas which they filled in the i-think Maps template.

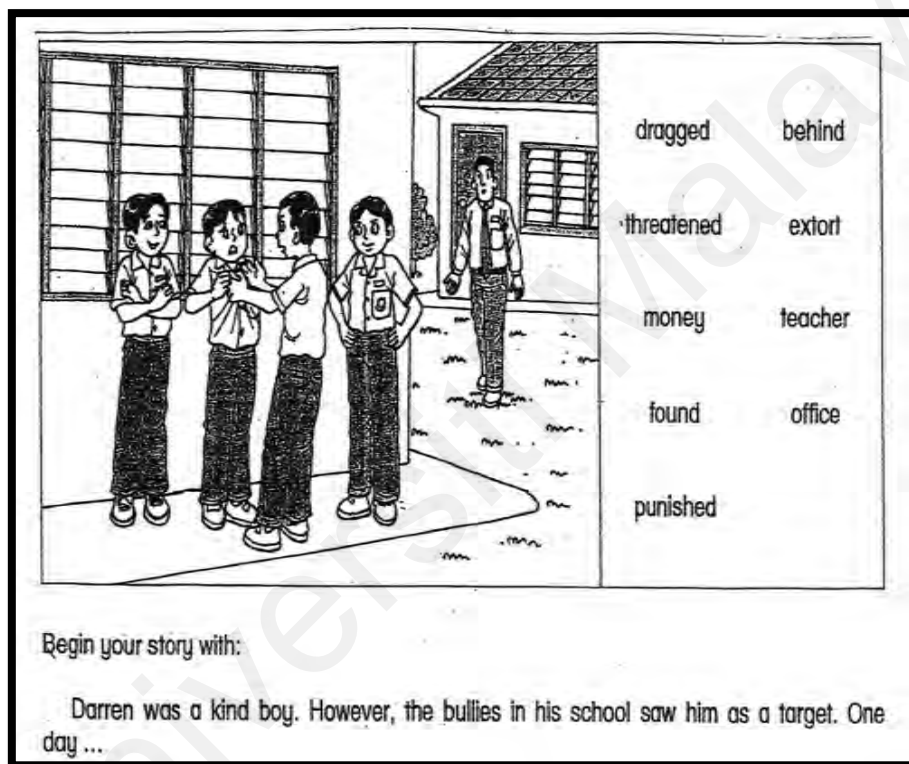


Figure 4.3 Post-test essay question

Below are four i-think Flow Maps templates which illustrate pupils' flow of ideas that impacted their essay writing in the Excellent, Good, Satisfactory and Weak categories respectively.

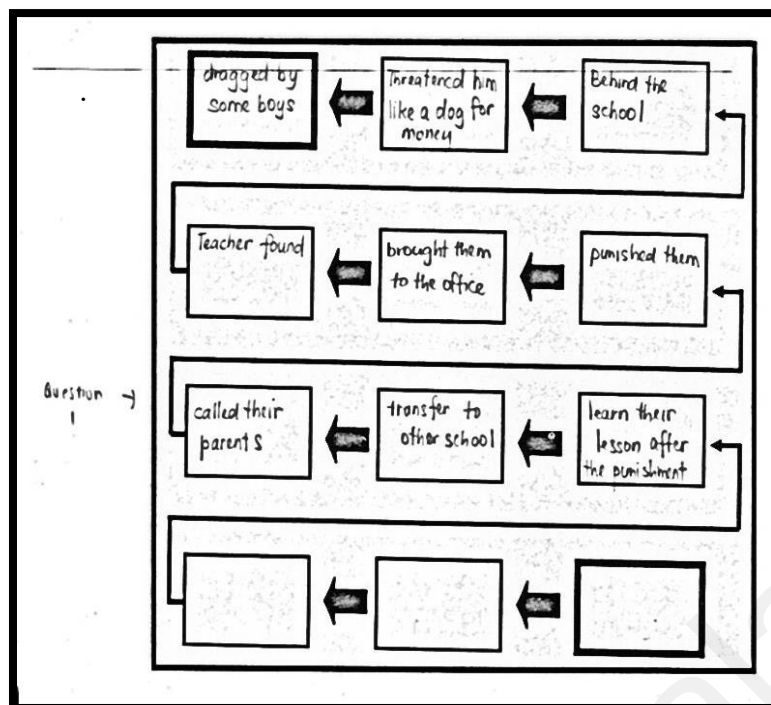


Figure 4.4 Excellent category, Asha, Flow Map1, 15 August 2018

The Flow Map shown in Figure 4.4 above was written by Asha (pseudonym), whose post-test essay was in the Excellent (Ex) category. She used the given narrative prompts and elaborated on them in her own words to show the clarity of her ideas. For example, she mentioned that the bullies “threatened him like a dog” which could mean that the boy (Darren) was badly treated. There were other phrases such as “called their parents”, “transfer to other school” and “learn their lesson after the punishment” which indicated that she had her network of goals and sub-goals in writing (Flower and Hayes, 1981). This showed that she was confident using new words to express her ideas. Moreover, the ideas were well planned, organized and linked logically. These are the characteristics of the Excellent category essay as stipulated by the UPSR marking scheme (Appendix E).

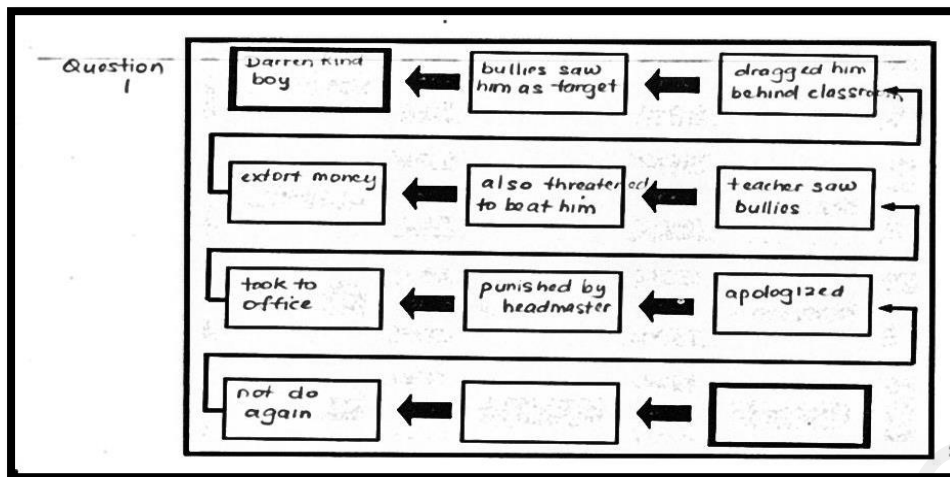


Figure 4.5 Good category, Ammar, Flow Map 2, 15 August 2018

The Flow Map shown in Figure 4.5 was illustrated by Ammar (pseudonym), whose essay was from the Good (Gd) category. He used the given narrative prompts and organized them in a clear and logical manner. He also used simpler phrases which conveyed his ideas well. This was in line with cognitive processes mentioned by Flower and Hayes (1981) that writers are cognitively engaged throughout the composition process. This process includes planning, reviewing, transcribing, revising, setting goals, idea organization and generation (Flower and Hayes, 1981). Ammar was able to expand words into phrases successfully. For example from the narrative prompt ‘dragged’, he was able to come up with the phrase ‘dragged him behind classroom’. This exemplified his ability to expand his thoughts by connecting to the task environment (the text) and long term memory (schema). There were other instances where he expanded words into phrases as shown in Figure 4.5 which qualified his essay into the Good category.

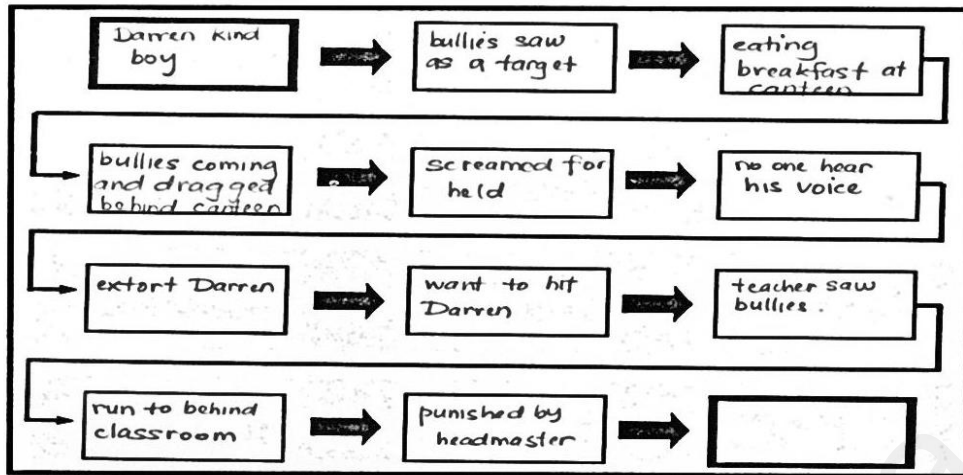


Figure 4.6 Satisfactory category, Din, Flow Map 3, 15 August 2018

The Flow Map shown in Figure 4.6 above was filled by Dino (pseudonym), whose essay was in the Satisfactory (St) category. We can see that he was able to sequence the narrative prompts cohesively and logically. He also used simple phrases to add meaning and content to his understanding of the narrative prompts. According to Flower and Hayes (1981), there are expert and novice writers due to the cognitive processing that takes place within their minds based on their long term memory, knowledge of the discourse and knowledge of the topic. Dino had also tried his best to expand words in phrases. For example the word ‘dragged’ was expanded to ‘bullies coming and dragged behind canteen’. However, we can see that he had minor grammatical errors in his tenses probably due to his first language interference. There were also spelling errors such as “screamed for held” which should have been “help”. These reasons qualified this essay to be graded as Satisfactory.

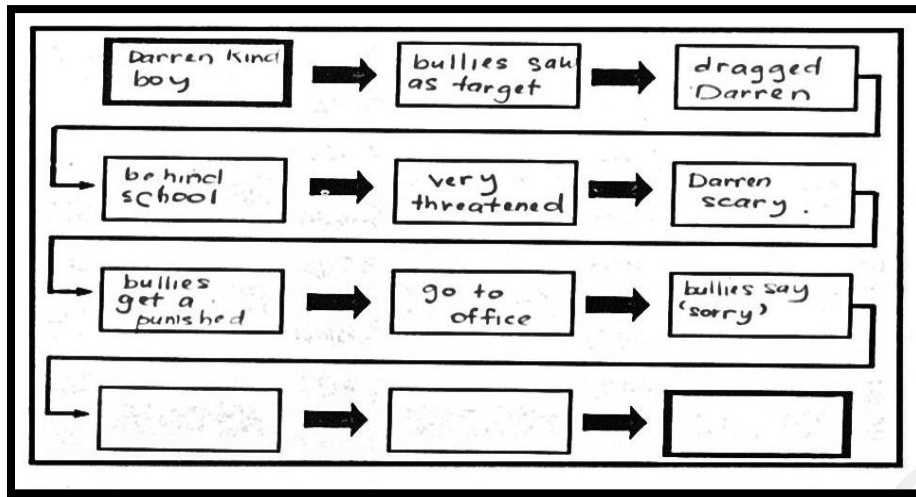


Figure 4.7 Weak category, Lily, Flow Map 4,15 August 2018

The Flow Map shown in Figure 4.7 above was illustrated by Lily (pseudonym), whose narrative essay was in the Weak (Wk) category. She was not able to sequence the narrative prompts into a correct flow of ideas as she could not understand some or all of the narrative prompts. There were also limited and incorrect use of vocabulary such as “Darren scary” and “bullies get a punished”, which denotes her lack of proficiency and poor use of the English Language. This exemplifies her inability to retrieve ideas from her long term memory based on the knowledge of the topic (Flower and Hayes, 1981). Therefore, this essay was graded as Weak.

4.2.3 Theme 2 – Role of Pupils in the flow of ideas

The focus of the second theme was the pupils’ role as they were the main subject of this study. They needed help and guidance to use the i-think Maps templates correctly in order to produce a good flow of ideas and improve their writing performance. According to Flower and Hayes (1981), “the act of composing is a goal-directed thinking process” (p. 366) which means pupils have to activate their thinking process to produce ideas in order to accomplish their goal of composing a piece of writing. The Cognitive Process Theory of Writing is grounded

on the cognitive processes that intertwine with thinking, drafting, composing and editing. Therefore, their roles were emphasized as they participated actively in the thinking processes.

Table 4.2

Role of Pupils in the Flow of Ideas

ITEMS	CHECKLIST ITEMS	N
2A	Pupils were able to use the i-think maps independently	10
2B	Pupils were focused on the map activity	10
2C	Pupils shared ideas and opinions to fill in the i-think Maps during brainstorming and group activities	9
2D	Pupils connected ideas logically and in correct sequence by writing them in the i-think Maps templates.	8

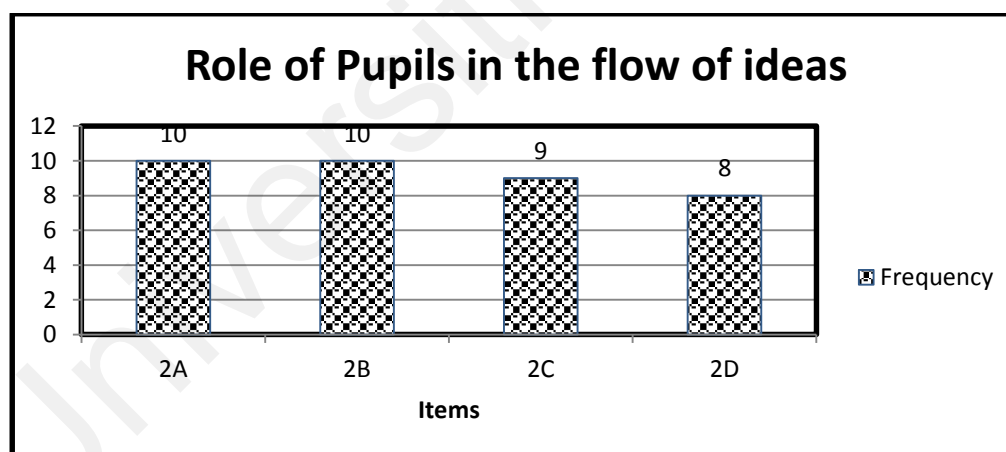


Figure 4.8 Role of Pupils in the flow of ideas

The second theme, which is the role of pupils, as shown in Figure 4.8 clearly indicated that they were able to use the i-think Maps independently and were focused on the task while completing the i-think Maps templates.

The second most frequent task was they shared ideas and opinions. Flower and Hayes (1981) agreed with rhetoricians such as Lloyd Bitzer and Richard Yartz about rhetorical situations or oral output before writing but they contended that although “they have a hand in the writing process, but it is not clear how they interact” (p.366). During brainstorming sessions, pupils discussed their flow of ideas and completed the i-think Maps templates as they needed to develop a sense of purpose in their writing (Flower and Hayes, 1981). More importantly, pupils were able to connect their ideas logically in the correct sequence or at times establish new ones based on what had been discussed (Flower and Hayes, 1981).

Asha : *get ideas and use i-think map*

Ammar : *get the idea and used i-think map*

(Excerpt 1, Asha and Ammar : lines 29 and 30, 25 June 2018)

From the excerpt, it is apparent that the use of i-think Maps is necessary for pupils to record their flow of ideas coherently. According to Hyerle (2004), writing is actually “thinking written down” (p. 74) which means pupils must think about what they want to communicate to their audience through their writing. Flower and Hayes (1981) stressed that the act of writing involves the task environment which refers to everything that is external to the writer beginning with the text. As such, pupils needed to make sense of the picture stimulus and writing prompts before they come up with the flow of ideas.

Suzie : *The i-think Maps allow pupils to visually organize their information after having group discussions and transfer them into their writing task. And brainstorming and discussing ideas in groups and completing the i-think Maps templates enabled the pupils to talk through the*

discussions, thus they had a deeper understanding of the i-think Maps' concept and expectations.

(Excerpt 2, Suzie : lines 19 - 25, 2 July 2018)

From the excerpt above, it is apparent that i-think Maps allow pupils to visually organize their ideas after having group discussions and then transfer them into their writing task. According to Hyerle (2004), the first step for them in learning to write essays is the organization of the essay which means they need to plan their flow of ideas sequentially in a cohesive manner. Their role in understanding the i-think Maps' concept enables them to complete the i-think Map templates with their flow of ideas. Thinking Maps are also known as "brainstorming webs" (Hyerle, 2004) which they fill in after they have brainstormed with their teachers and friends. Flower and Hayes (1981) also stated that pupils' long term memory such as knowledge of the topic, their audience and writing plans such as their flow of ideas are important elements of writing.

Suzie : Pupils loved the challenge and engaged in learning when they were able to use the i-think Maps individually especially during the post-test and during group work.

(Excerpt 2, Suzie : lines 46- 48, 2 July 2018)

The participant teacher did notice differences in pupils' flow of ideas after using i-think Maps as shown in the excerpt above. Generating ideas involved getting information from their long term memory which is stimulated through brainstorming and group discussions (Flower and Hayes, 1981). Thus, the i-think Maps aided the pupils as they used them to record their flow of ideas.

Suzie : Pupils are excited as they discuss and compare ideas during brainstorming sessions before completing the i-think Maps because their views that are correct are appreciated and well received by their peers. They also

practice listening to their peers' opinions and taking turns. They acquired a sense of achievement and are able to choose what they decide to write autonomously. When they know that their ideas are well received, they attempt to excel in their writing.

(Excerpt 2, Suzie: lines75- 80, 2 July 2018)

In the excerpt above, the participant teacher stated that there was improvement in pupils' flow of ideas as they were guided by goals and sub-goals in writing (Flower and Hayes, 1981). Moreover, the cognitive processes taking place in their minds gave room for them to plan, translate and review their ideas to suit the narrative essay, enabling them to write autonomously. Therefore, the i-think Map templates served as effective cognitive tools for pupils to write down their ideas, opinions and choices systematically (Hyerle, 1995).

4.2.4 Theme Three – Role of Teachers in the flow of ideas

Theme three provided insight into the role played by the teacher in facilitating and guiding pupils in the classroom during treatment lessons. There were many qualities portrayed by her that supported the successful use of the i-think Maps and explicit teaching techniques that were suitable for pupils as they used the i-think Maps templates. The scaffolding role (Hyerle, 2004) played by the teacher in using the i-think Maps templates influenced pupils in their flow of ideas.

Table 4.3

Role of Teacher in the Flow of Ideas

ITEMS	CHECKLIST ITEMS	N
3A	Teacher clearly explained the lesson and its goals	10
3B	Teacher explained the functions of i-think Maps clearly	10
3C	Teacher demonstrated a positive attitude towards the maps	8
3D	Teacher conveyed the information on i-think Maps clearly	10

3E	Teacher used a frame with the map	4
3F	Teachers used guiding questions/prompts to facilitate pupils' flow of ideas.	8

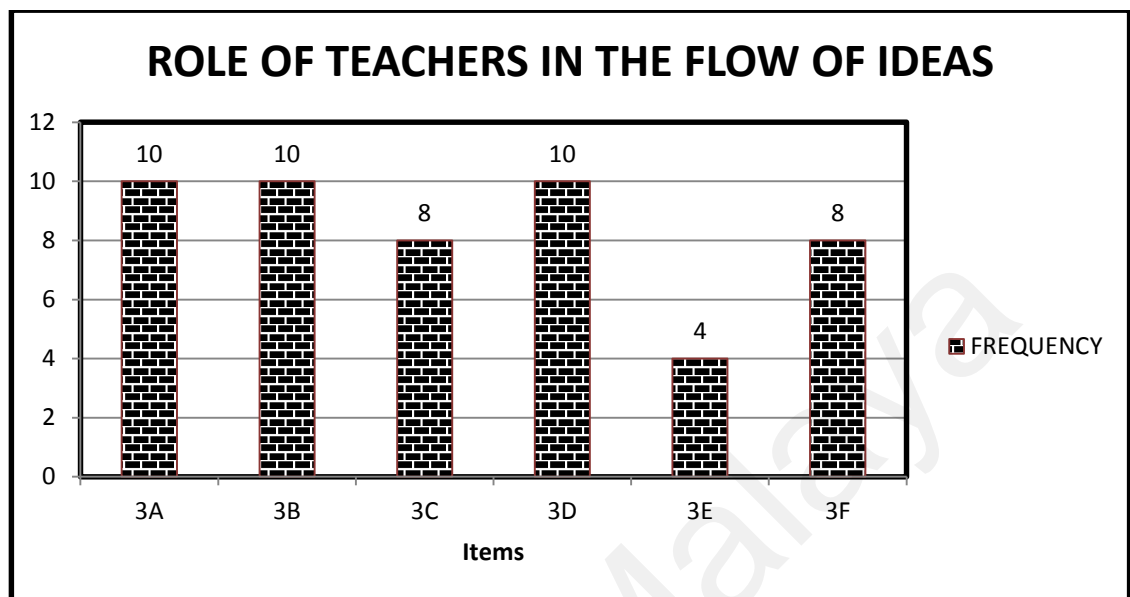


Figure 4.9 Role of Teachers in Pupils' Flow of Ideas

From Table 4.9 above, we can see the teacher's role in facilitating pupils' flow of ideas. According to Hyerle (2004), teachers "must be empowered with knowledge about writing, so that, they can be the most effective model for their pupils" (p. 82). The most important task portrayed by the teacher in engaging pupils in their flow of ideas was by defining the lesson and its goals at the beginning of the lesson. She also explained the functions of i-think maps and conveyed the information clearly. The positive attitude shown by her towards i-think Maps also made an impact on the pupils who completed the templates correctly. Thus, the scaffolding provided by the teacher was effective in helping pupils improve their writing.

Prompt questions were also often utilized as cues to tap into pupils' long term memory and to re-establish the purpose for writing (Flower and Hayes, 1981).

Teacher posed prompt questions in order to facilitate pupils' planning and thinking processes in writing (Hyerle, 2004).

Asha : teacher have discussion and get ideas and write sentence

Ammar : teacher explain and got ideas, write sentence correct, also understand words

(Excerpt 1, Asha and Ammar : lines 24 - 27, 25 June 2018)

When the interviewed pupils were asked about their teacher's role in helping them to write, they reiterated that their teacher guided them during discussions and gave explanations which took place during the brainstorming sessions. Therefore, their teacher's guidance was necessary for them during the planning stages of writing whereby they were able to complete the i-think Maps templates with their flow of ideas after brainstorming sessions and group discussions.

Suzie : Yes, they have definitely improved. The learning style using i-think Maps and teacher's instructional approach are main contributors to pupils' writing performance.

(Excerpt 2, Suzie: lines 55 – 57, 2 July 2018)

From the excerpt above, the participant teacher noted the improvements in her pupils' flow of ideas and writing performance after using i-think Maps. Therefore, teachers played an important role in facilitating their writing as it is a "goal-oriented process" (Flower and Hayes, 1981).

Suzie : The i-think Maps help pupils to generate more ideas and improve their interest in writing. It helps them to focus on their flow of ideas which helps them to write better. Some pupils have shown a lot of improvement in their writing. They were able to organize their ideas for the writing task.

Teacher's input during brainstorming sessions and group work through prompts and questions helped pupils greatly. This is because she explained the functions of the i-think Maps clearly and conveyed information about the Maps vividly.

(Excerpt 2, Suzie : lines 62 – 68, 2 July 2018)

From the excerpt above, the role of the teacher as a facilitator has been clearly defined in guiding pupils to complete the i-think Maps templates with their flow of ideas. According to Flower and Hayes (1981), “planning is a legitimate part of the writing process” (p. 367) and teachers play a crucial role in the helping pupils in the planning process using i-think Maps.

Moreover, the thinking processes at work in their minds are not visible and as such, teachers play an important role in helping pupils to make sense of the text (task environment) and retrieve information from their long term memory through brainstorming and group discussions. Teachers also need to help pupils determine the purpose of writing through establishing goals and sub-goals, which are their flow of ideas, that they are free to retain or change as they plan, translate and review their writing (Flower and Hayes, 1981).

4.3 Research Question 2: Is there an impact in Year Five pupils' writing performance after using i-think Maps?

In order to answer Research Question 2, a pre-test was administered to the non-random pre-experimental: one group pre-test post-test group on the first day of the study and at the end of ten weeks, a post-test was given after the intervention consisting of five treatment lessons were completed.

Both the pre-test and post-test scores were recorded before making statistical analysis and comparisons using the Paired Samples t-Test analysis in the SPSS v.25 program. The Paired Samples t-Test compared two means that were from the same individual, object, or related units.

The two means basically represented two different periods (e.g., pre-test and post-test with an intervention between the two time points). The aim of the test was to determine whether statistical evidence indicated mean differences between paired observations on a particular outcome that was significantly different from zero (Chua, 2013).

Table 4.4

SPSS v.25 Pre-test and Post-test Statistical Analysis

		Pre-Test	Post-test
N	Valid	28	28
	Missing	0	0
Mean		7.71	10.57
Median		5.00	8.50
Mode		4	7
Std. Deviation		5.643	5.196
Variance		31.841	26.995
Skewness		1.640	1.279
Std. Error of Skewness		0.441	0.441
Kurtosis		1.658	.733
Std. Error of Kurtosis		0.858	0.858

The data, namely the pre-test and post-test scores are normal because the skewness for the pre-test is 1.640 and post-test is 1.279 whereas kurtosis for the pre-test is 1.658 and post-test is 0.733 which are all between ± 2 . This proves the normality of both sets of data although the sample size is small namely 28. (Field, 2009; George, & Mallery, 2010).

Table 4.5

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre_Test	7.71	28	5.643	1.066
	Post_test	10.57	28	5.196	0.982

From Table 4.5, the results suggested a significant difference in the scores for pretest (M=7.71, SD=5.643) and post-test (M=10.57, SD=5.196). Paired t-Test also suggested that there was a significant difference in scores with a degree of freedom of 27 and t value of -9.295. The p-value which is 0.000, explained that results were significant at 1%.

According to George and Mallery (2010), a conventional (and arbitrary) threshold for declaring statistical significance is a p-value of less than 0.05 or significant at 5% which shows there is a 5% error and 95% correctness. In this study, the p value is 0.000 and is significant at 1% which shows that there was a possibility of only 1% error and 99% correctness in the t-Test that was conducted (Chua, 2013) which denotes statistical significance of the post-test scores.

Higher means score for the post-test suggested that there was a significant difference as pupils achieved better scores in their post-test. However, as random sampling is a requirement of paired sample t-Test (Chua, 2013) and the pupils in this study were selected non-randomly, the use of i-think Maps could not have solely contributed to the increase in the pupils' post-test scores.

Table 4.6

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre-test and Post-test	28	0.958	0.000

In Table 4.6 above, paired sample correlations results were shown. Here the correlation between each of the pairs of variables was given. Since this was a repeated measure analysis using pre-test and post-test, the same pupils' writing scores were measured twice. There appeared to be a high degree of correlation between the two sets of scores which was 0.958.

Table 4.7

Paired Samples t-Test

		Paired Differences					T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-test – Post-test	-2.857	1.627	.307	-3.488	-2.226	-9.295	27	0.000

Based on the data shown in Table 4.7, the results suggested that there was a significant difference in the pupils' writing performance after using i-think Maps during writing. The results were significant at 1%. There was a strong and positive correlation between pre-test and post-test scores. The mean score for the pre-test was 7.71 and post-test was 10.57 with standard deviation of 5.643 and 5.196 respectively. Moreover, the paired t-Test suggested that there was a significant difference in scores with a degree of freedom of 27 and t value of -9.295. The p-value was 0.000, which explains that the results were significant at 1%.

However, the use of i-think Maps cannot be solely responsible for the increase of post test scores due to validity and reliability issues such as sampling because the pupils in this study were not selected randomly (Chua, 2013). Moreover, this study was only carried out on an experimental group of pupils from Year Five Ibnu Sina without a control group. As such, there may be other extraneous variables which may have contributed to the increase in post-test scores. The significant increase in the post-test scores applies specifically to the subjects of this study namely the pupils of Year Five Ibnu Sina.

4.3.1 Pretest and Post-test Grades

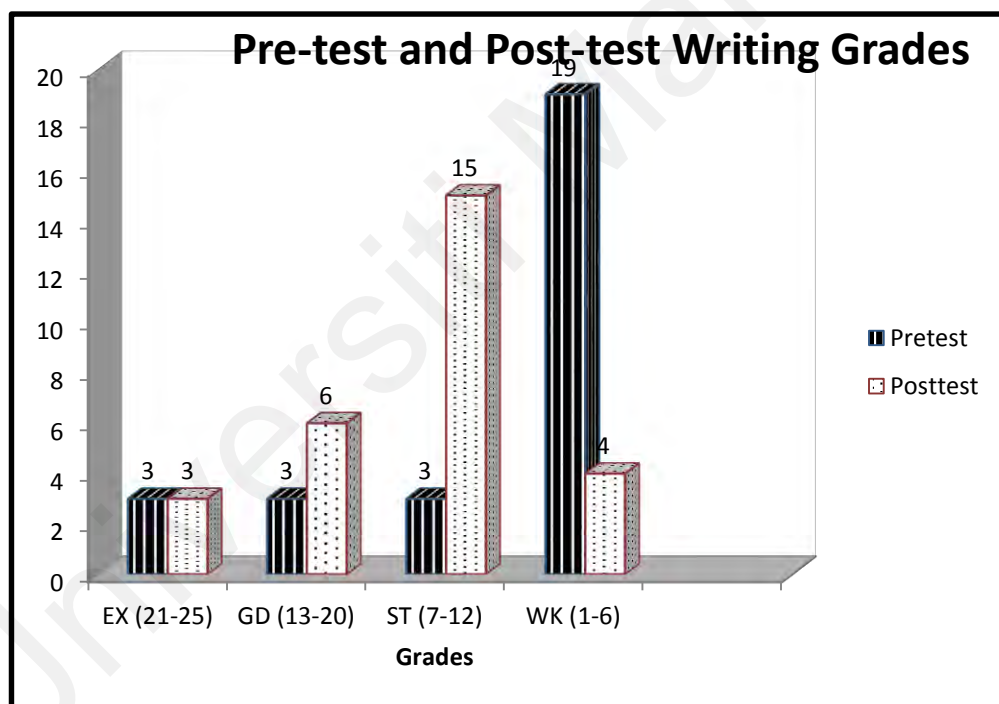


Figure 4.10 Pre-test and Post-test Grades

As shown in Figure 4.10 above, pupils of Year Five Ibnu Sina had shown improvement in their writing performance during the post-test. However, although pupils had increased in their post-test grades, the number of pupils in the excellent (EX) category with scores ranging from the 21-25 remained at three.

Below are four sample essays from the Excellent, Good, Satisfactory, and Weak categories during the post-test. Firstly, pupils from the excellent (EX) category had well-planned and organized ideas that were sequenced correctly. Their ideas were also linked properly to sustain the interest of readers. They also used new words to explain their ideas and wrote a variety of sentences to convey their ideas clearly (Refer to Figure 4.11).

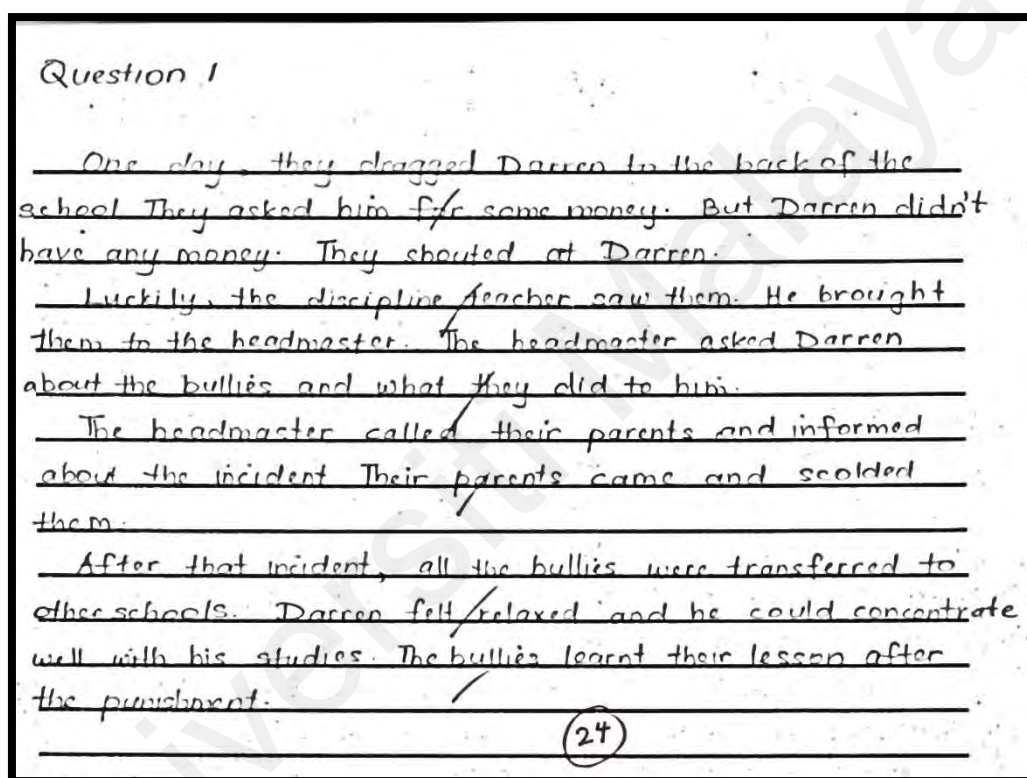


Figure 4.11 Excellent category, Asha, Essay 1, 15 August 2018

The essay above (Figure 4.11) showed that Asha (pseudonym) had very confident use of language. Her ideas were conveyed clearly through a variety of sentence structures. They were also well organized and arranged in a cohesive manner. Moreover, there were new words that were correctly used to convey the meaning clearly. For example the words “transferred”, “relaxed” and “concentrate well” were used to narrate the story well and make it captivating to sustain the

attention of the readers. Her well planned and properly sequenced ideas conveyed an interesting narrative with a clear ending. Accuracy in spelling and punctuation also contributed to the achievement of the Excellent band of this essay.

Secondly, essays from the Good (GD) category within the range of 13-20 increased from three to six. Pupils from this category attempted to construct a variety of sentences with occasional errors. Most of their ideas were well organized and conveyed logically. They also used new words to express ideas that were relevant to their essays (Refer to Figure 4.12).

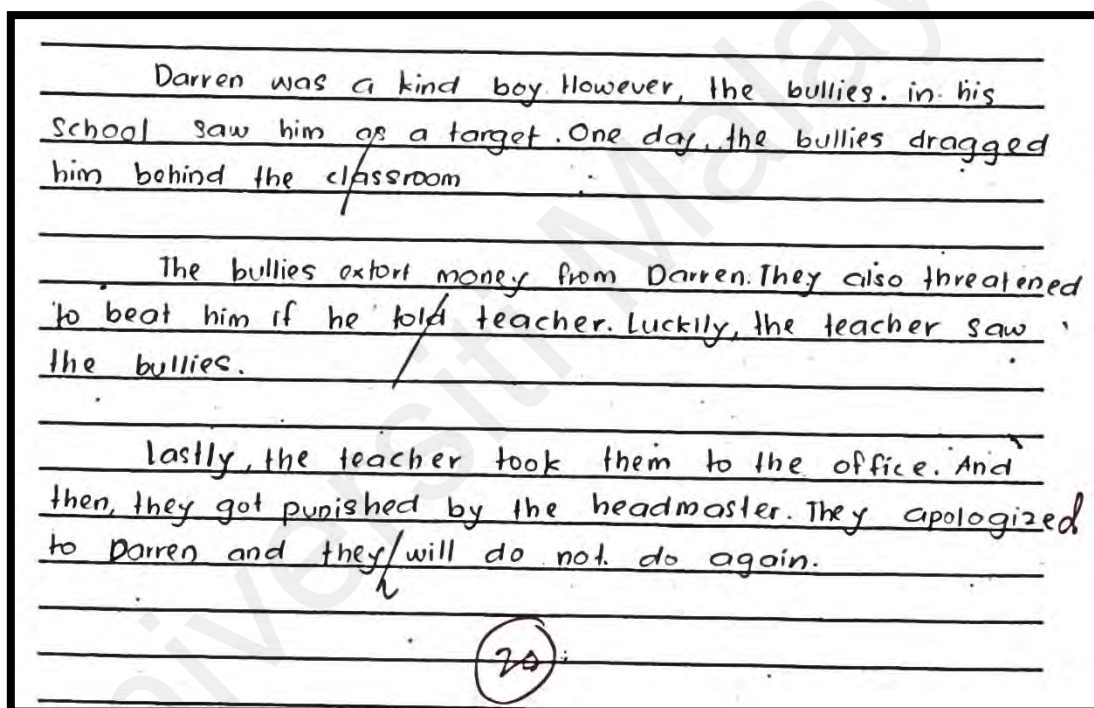


Figure 4.12 Good category, Ammar, Essay 2, 15 August 2018

For example, Ammar's (pseudonym) essay was graded as Good (Figure 4.12). He was proficient in the use of the English Language. He also attempted to construct a variety of sentence structures although occasional errors did occur. For example, the sentence which he wrote, "the bullies extort money from Darren" (paragraph 2, line 1) had a grammatical error. Another incorrect sentence was "They apologized to Darren and they will do not do again" (paragraph 3, lines 2-3).

However, this essay had a good flow of ideas which were well-organized, relevant and clear. Moreover, Ammar used a new paragraph to convey a new idea or event. In addition, new words such as ‘beat’, ‘luckily’ and ‘apologized’ were used to make the narrative more captivating in order to sustain the interest of the readers.

Thirdly, the number of Satisfactory (ST) category essays with scores of 7 – 12 increased from three to nineteen in the post-test. These pupils wrote simple sentences with minor grammatical errors but the meaning was still comprehensible. They presented their ideas clearly in their correct sequence with adequate vocabulary to convey their meaning satisfactorily. There were also a few punctuation and spelling errors found in the essays. (Refer to Figure 4.13)

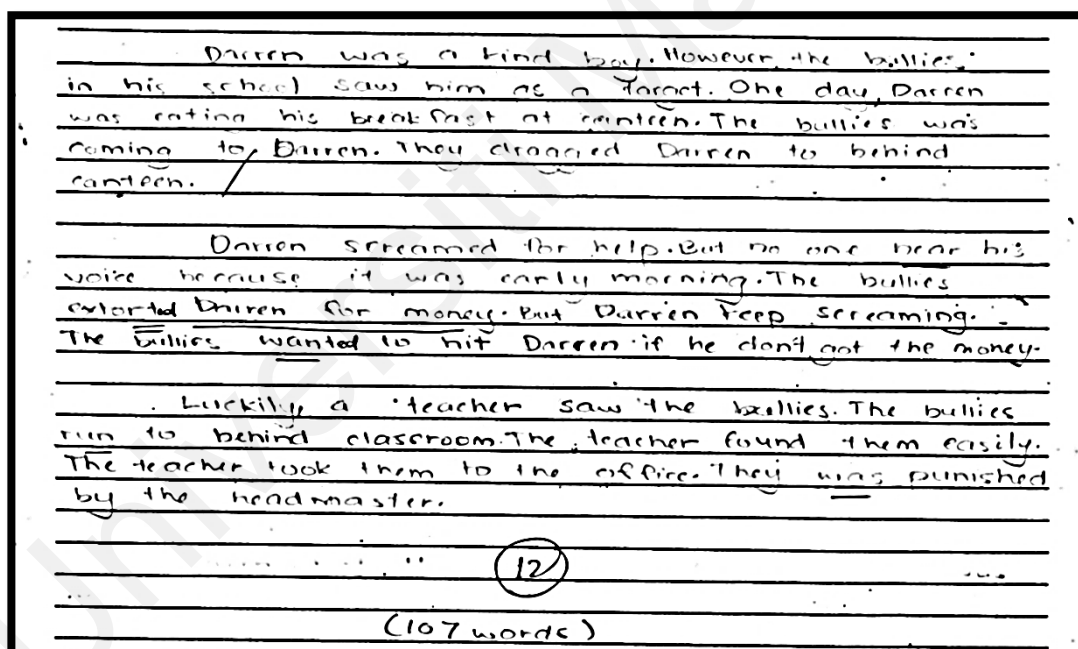


Figure 4.13 Satisfactory category, Dino, Essay 3, 15 August 2018

The sample essay shown in Figure 4.13 was written by Dino (pseudonym) which was graded in the Satisfactory category. He wrote simple sentences which contained minor errors. For example, “the bullies was coming to Darren” and “they dragged Darren to behind canteen” (paragraph 1, lines 3-4) portrayed grammatical

errors found in the essay. Nevertheless, he used most of the narrative prompts given and presented his ideas satisfactorily. Moreover, the selection of vocabulary was adequate to convey the meaning clearly. More importantly, he used paragraphs to present new events or ideas correctly. Although there were a few grammatical mistakes, correct punctuation was used throughout the essay.

Finally, pupils from the Weak category decreased from nineteen to four. They obtained scores ranging from 1 – 6 and produced essays that contained multiple errors in the sentences with poor use of language. Their ideas were not conveyed clearly and there was direct lifting of words and phrases from the given narrative prompts. Most of them made mistakes with vocabulary which showed they did not comprehend the meanings of the given narrative prompts. Moreover, there was chunking of words and their essays were also very short and scanty (Refer to Figure 4.14).

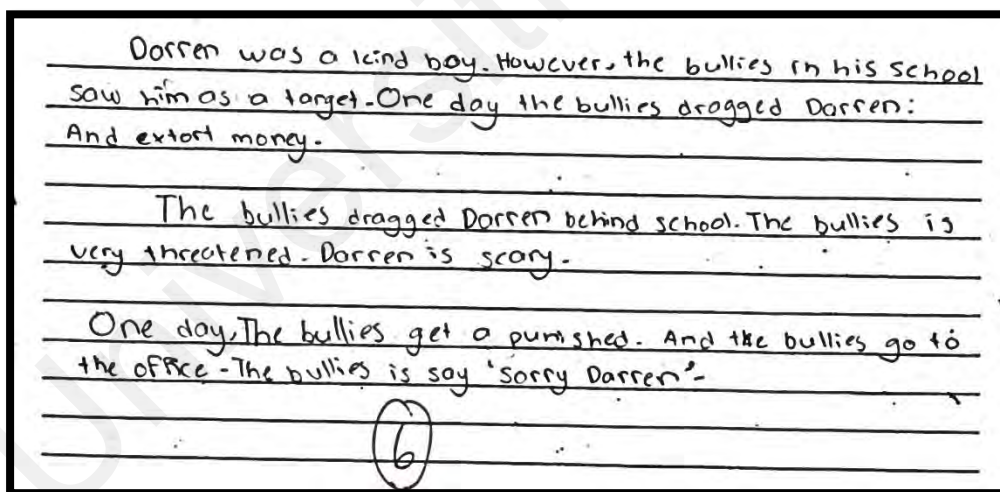


Figure 4.14 Weak category, Lily, Essay 4, 15 August 2018

Lily's (pseudonym) essay shown in Figure 4.14 above was graded as Weak. She displayed poor proficiency of language as there were many mistakes found in the essay. The ideas presented in the essay were unclear as there was incorrect use of vocabulary which skewed the meaning. For example, "The bullies is very

threatened” (paragraph 2, lines 1 – 2) conveys an opposite meaning to the actual meaning which should have been “The bullies threatened Darren”. Therefore, due to lack of vocabulary knowledge, the meaning became unclear and confusing. The ideas were also not properly linked which made the narrative vague and meaningless. For example, she began the final paragraph with “one day” which jumbled the flow of the story. In addition, there were also punctuation and capitalization errors found in the essay.

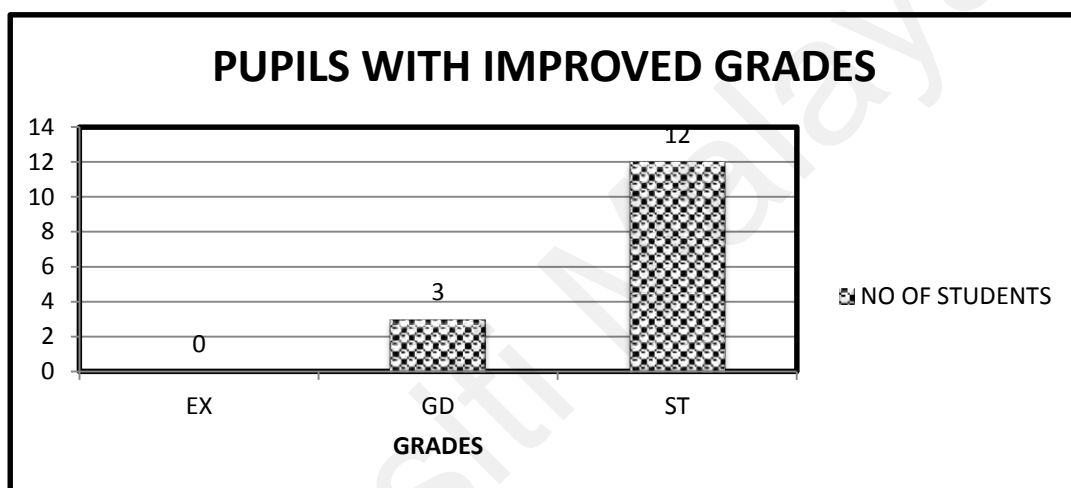


Figure 4.15 Pupils with improved grades

From Figure 4.12 shown above, some pupils showed marked improvements in their post-test writing grades when compared with their pre-test. Three of them progressed from satisfactory (ST) to good (GD) while twelve others progressed from weak (WK) to satisfactory (ST).

Below are four sample essays to show those who progressed from one category to the next. This was an encouraging sign of the impact of i-think Maps in improving the flow ideas and writing performance of the Year Five Ibnu Sina pupils.

Pretest - Satisfactory

Question: _____

Last weekend was SK Johan Raja Muda's Family Day. It was a beautiful day and the event was held at the school field. Many people joined parents and students.

At there here a family picnic too. Students and parents brought many food for eat together. I and my friend play sock race. In there many games and competition.

Johan won prizes. We cheered and clapped hand to him. We sing together. I so happy with my family and friends.

Lastly, I and my family back home. The Family Day is so interesting and we happy.

(10)

Post-test - Good

Darren was a kind boy. However, the bullies in his school saw him as a target. One day, the bullies dragged him behind the classroom.

The bullies extort money from Darren. They also threatened to beat him if he told teacher. Luckily, the teacher saw the bullies.

Lastly, the teacher took them to the office. And then, they got punished by the headmaster. They apologized to Darren and they will do not do again.

(24)

Figure 4.16 Satisfactory to Good category, Wanda, Essays 5 & 6, 15 August 2018

For example, Wanda (pseudonym) progressed from the Satisfactory (ST) to Good (GD) category as shown in Figure 4.16 above. She presented clear, well-organized and relevant ideas to convey a logical meaning to the narrative. Although, there were occasional errors in the post-test, she managed to construct a variety of sentences. There was also an effective use of vocabulary and new ideas were expressed with new words such as “Luckily, the teacher saw the bullies” (paragraph 2, lines 2-3).

On the contrary, during the pre-test, the essay that she wrote lacked clarity as the order of events in her narrative was confusing. In addition, her ideas were also disorganized and not well sequenced. She attempted to construct simple sentences but they contained errors in their structures and grammar. She also lifted words

provided in the narrative prompts which were used incorrectly, making the narrative unclear. For example, the pupil wrote “At there have a family picnic” and “In there many games and competition” (paragraph 2, lines 1, 3 & 4) which denotes the influence of her native language.

Subsequently, pupils who progressed from the Weak (WK) to Satisfactory (ST) category with scores from 7-12 were able to write simple sentences with slight errors but the meaning was clear. They also used the given narrative prompts correctly and presented their ideas adequately. In addition, they used new and appropriate vocabulary to add interesting details to the narrative. Nevertheless, they made a few punctuation and spelling errors in their essays. On the contrary, during the pre-test, ideas were not properly sequenced and the meaning was incomprehensible. They were also unable to describe the events systematically, cohesively and adequately using the given narrative prompts. There were also numerous errors found in the sentences making the essays incomprehensible (Refer to Figure 4.17).

Pretest - Weak

Question: 1

Last weekend was Sk Jolan Raja Mada's Family Day. It was a beautiful day and the event was held at the school field. Many people go to Sk Jolan Raja Mada's Family Day. It is parents and students.

Many people brought many food. Many people go to the family picnic. Many people eat and food. Many people get ready to start a sport activities.

Many people get ready to start a activities at 8.30 am. Many people chose the track and. When activities sock race start many people jump for win.

The won prizes is Adam Haisal. Many people cheered and clapped. Adam Haisal is happy because he win.

(9/9)

Post-test - Satisfactory

Darren was a kind boy. However the bullies in his school saw him as a target. One day Darren was eating his breakfast at canteen. The bullies was coming to Darren. They dragged Darren to behind canteen.

Darren screamed for help. But no one hear his voice because it was early morning. The bullies started Darren for money. But Darren keep screaming. The bullies wanted to hit Darren if he dont out the money.

Luckily a teacher saw the bullies. The bullies run to behind classroom. The teacher found them easily. The teacher took them to the office. They was punished by the headmaster.

(12/)

(107 words)

Figure 4.17 Weak to Satisfactory category, Syah, Essays 7 & 8, 15 August 2018

Figure 4.17 above shows two essays written by Syah (pseudonym), one of which was graded as Weak during the pre-test and the other progressed to Satisfactory in the post-test. During the pre-test, the essay was written using poor language with disorganized ideas which made the essay very unclear and incomprehensible. Although he used the provided narrative prompts, but it was obvious that he could not understand them and used them ineffectively which conveyed an illogical meaning to the narrative. As such, there were multiple errors found in the sentence structures. For example “Many people go SK Jalan Raja Muda’s family day, is parents and students” (paragraph 1, lines 3-4). We can see that the tenses and sentence structures were inaccurate. Moreover, he used the phrase ‘many people’ repeatedly for seven times which indicated that he lacked comprehension of what he was narrating.

However, the post-test essay written by him consisted of simple sentences with minor errors but their meaning was clear. For example, “They dragged Darren to behind canteen” (paragraph 1, line 4-5) exemplifies an error in the use of preposition. However, the meaning of the sentence was comprehensible. Another example is, “the bullies want to hit Darren if he didn’t got the money” (paragraph 2, line 4). In this sentence, we can see that even though he was unsure of the tenses, the meaning of the sentence was logical. He used most of the narrative prompts correctly and there was a satisfactory presentation of ideas. Although there were occasional punctuation errors, on the whole, this essay qualified to be rated as Satisfactory. Therefore, the use of i-think Maps did make an impact on pupils’ writing performance.

The number of pupils with improved scores in their post-test from weak (WK) to satisfactory (ST) were 24 compared with the pre-test which was only 9.

Therefore, 15 pupils exhibited improvement in their writing performance which shows an increase of 53.6%.

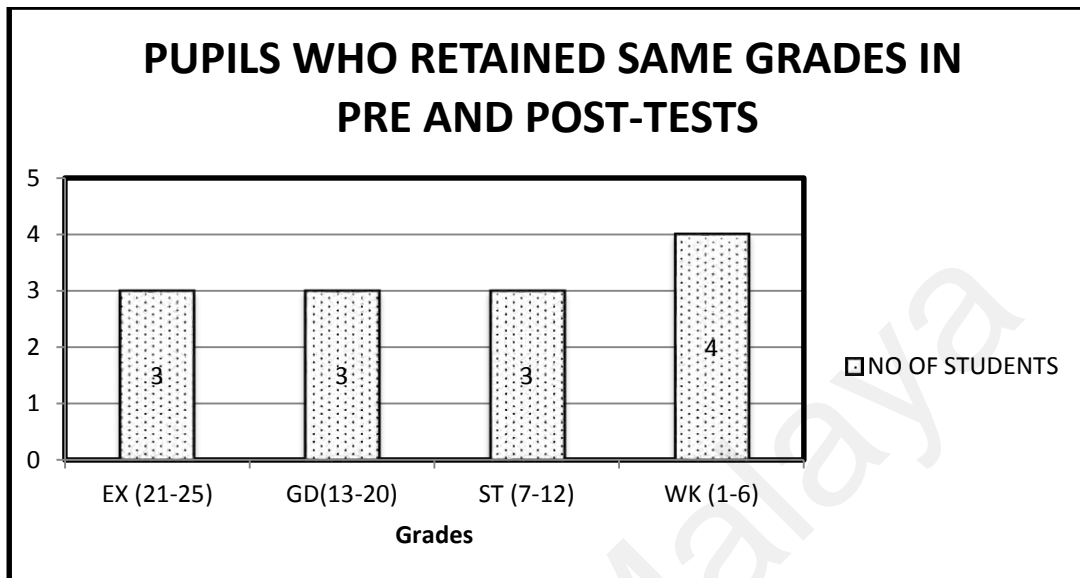


Figure 4.18 Pupils who retained the same grades in Pre-test and Post-test

In Figure 4.18 above, there were pupils who retained their grades in both the pre-test and post-test. Three of them remained in the Excellent (EX) category scoring 21 - 25, whilst three others remained in the Good (GD) category with scores ranging from 13 - 20 whereas another three remained in the Satisfactory (ST) category with scores ranging from 7 – 12. Unfortunately, there were four pupils who were still in the weak (WK) category with their scores below 6.

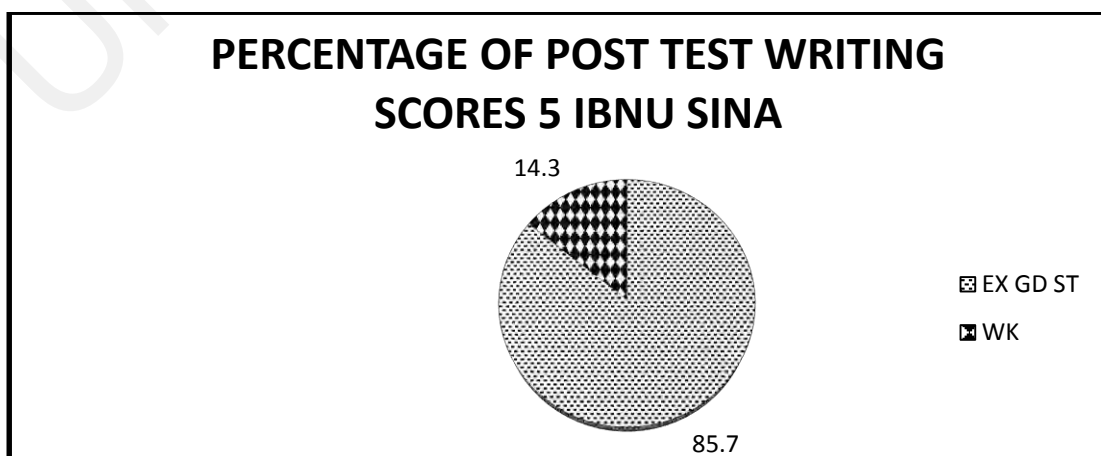


Figure 4.19 Percentage of writing scores

As illustrated in Figure 4.19 above, four pupils (14.3%) remained in the weak (WK) category which shows that they failed in their writing test. These pupils were weak in their English Language proficiency and their essays were poorly written. Below is the sample essay from the Weak category (refer to Figure 4.20).

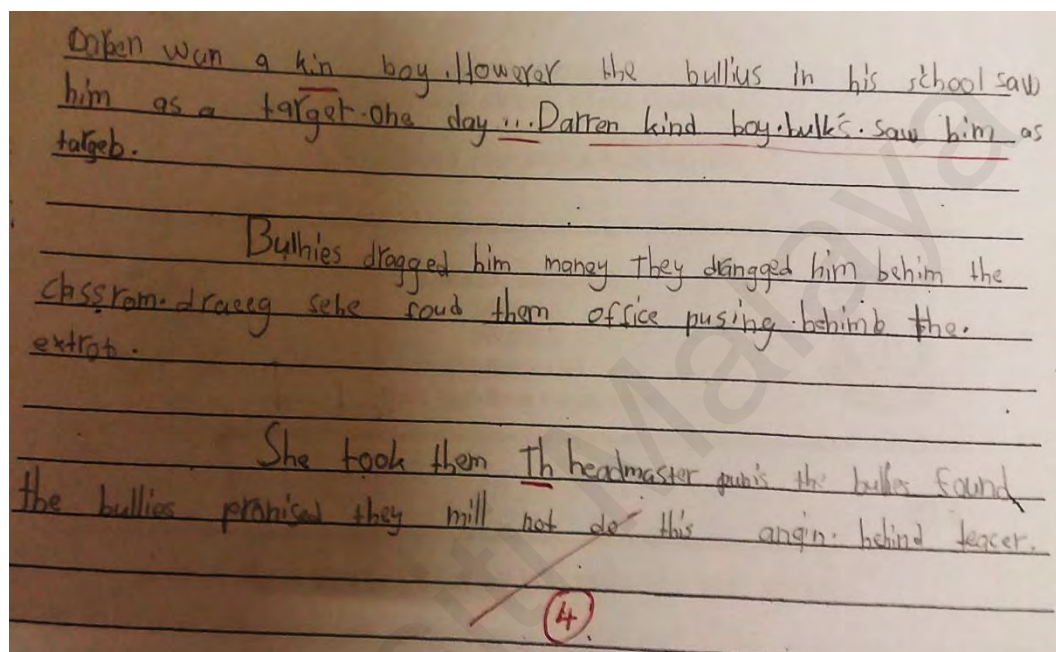


Figure 4.20 Weak category, Liz, Essay 9, 15 August 2018

The essay shown in Figure 4.20 above was graded as Weak. Liz (pseudonym) displayed poor use of language in her writing. She lacked understanding of the narrative prompts given as vocabulary for the essay writing but used them anyway thus making her essay incomprehensible and unclear even after several readings. For example the sentence, ‘bullies dragged him money’ (paragraph 2, line 1) was unclear and the meaning was redundant. There were also chunking of words such as “dragged so he found them office pusing behind the extort” which indicated that she lacked lexical knowledge. The order of events in the narrative was confusing and the story needed a proper beginning, middle and end. Moreover, she

switched tenses inappropriately between the present and past tenses. For example, instead of the past tense 'punished', she used its present tense (paragraph 3, line 1). However, she did manage to use paragraphs in her writing. But there were many spelling mistakes due to interference from her mother tongue and incorrect capitalization.

4.4 Qualitative Data Findings that Support Pupils' Writing Performance

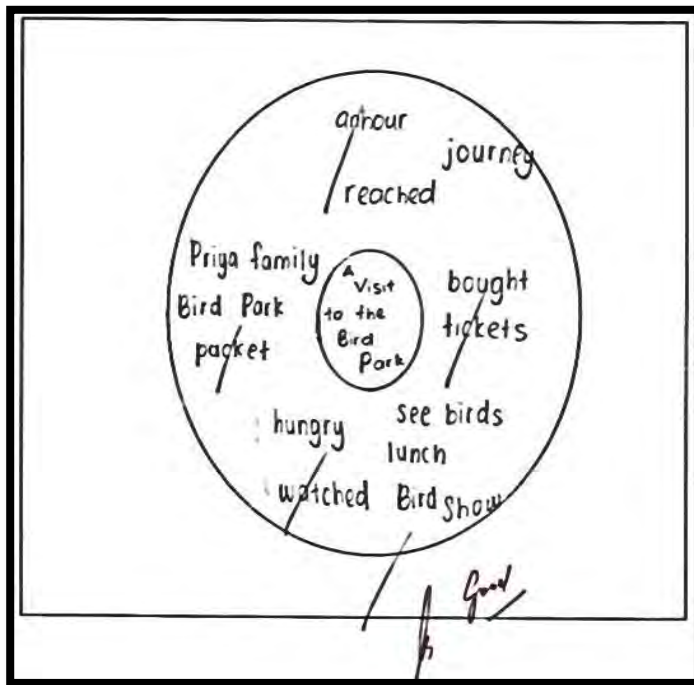
Qualitative data used in this study such as checklists, structured interviews and document analysis also provided significant findings on the writing performance after pupils used i-think Maps. The three emerging themes, namely the role of i-think Maps, role of pupils and the role of teacher shed light on pupils' writing performance.

Firstly, the role of i-think Maps as cognitive tools helped pupils to write down their flow of ideas after brainstorming sessions and group discussions into the i-think Map templates. Since, the ideas were written sequentially, pupils could recapture the essay's flow of events and complete their writing task with ease (Hyerle, 2001).

Suzie : The i-think Maps allow pupils to visually organize their information after having group discussions and transfer them into their writing task.

(Excerpt 2, Suzie : lines 19 and 21, 2 July, 2018)

The excerpt above reinforces the use of i-think Maps in writing as pupils were able to arrange their ideas cohesively as they referred to them. Thus, pupils' writing performance was enhanced after using the i-think Maps templates. Below are samples of i-think Maps and the corresponding essay during the treatment lessons.



THUGASRI / SIVALINGAM
5 IBNU SINA

Writing Task 1 - A Visit to the Bird Park

Last Sunday, Priya and her family went to the bird park in Pral.

Priya was very happy when her parents told about the trip. In the morning,
Priya and her elder brother Raj woke up very early. They quietly took
their bath. Then, they had their breakfast. Later, both of them packed
their belongings for the trip.

The journey from Priya's house took about an hour. During the
journey, Priya and her brother enjoyed the beautiful scenery along the
road. At sharp 8.00 a.m., they reached the bird park. Once they have
reached, Priya's father, Mr. Somu bought the tickets. They walked
into the Bird Park after buying the tickets. An hour later, they were
tired and hungry. Then they decided to stop for a while to have lunch
and rest. Later, they continued walking around the Bird Park.

It was an unforgettable experience for them. Finally, they
returned home feeling tired but happy.

(24/05)

Figure 4.21 Treatment lesson Circle Map and Essay 1, 6 March 2018

Figure 4.21 is a sample of a writing exercise taken from the treatment lesson. Sue (pseudonym) who was exposed to the Circle Map, was able to produce an essay based on what she filled in the i-think Maps template. She produced well-organized and cohesive ideas which were logically sequenced to convey a clear meaning to the narrative about 'The Visit to the Bird Park'. The ideas were also well linked to sustain the interest of the readers. Moreover, the story had a clear beginning, middle and end. She had also attempted to use paragraphs to convey new ideas or events. There was also accurate use of spelling and punctuation. Thus, the i-think Maps did impact pupils' writing performance.

Asha : *Happy and confident*

Ammar : *Happy...now I like writing*

(Excerpt 1, Asha & Ammar: lines 7 & 8, 25 June 2018)

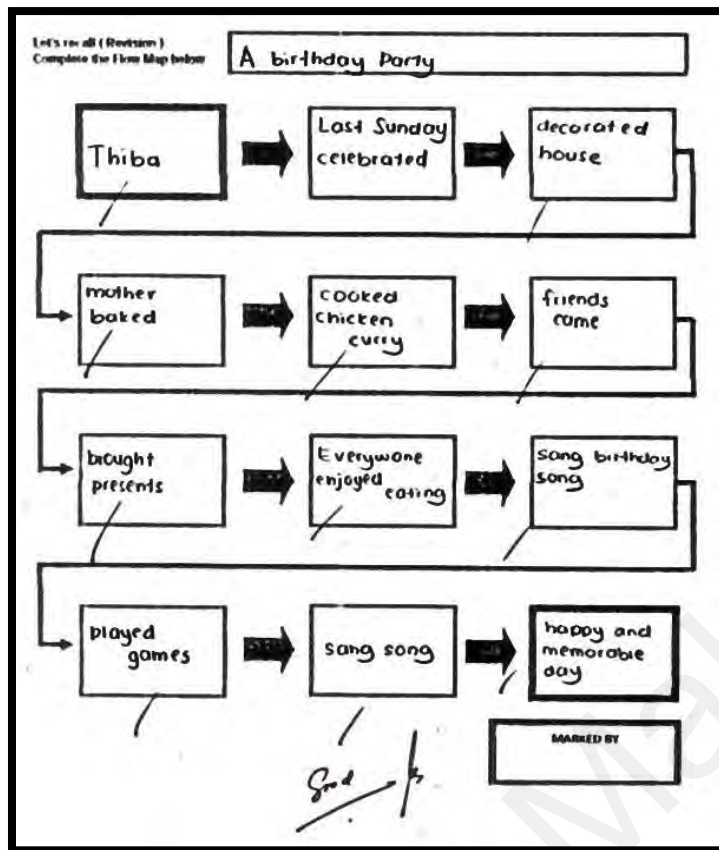
The two pupils who were interviewed reiterated that the i-think Maps helped them in their writing task. As such, they were more eager and confident in their writing task. These findings were similar to a study by Sovakandan, Jaganathan and Husain (2018) where i-think Maps were also used to help pupils in their writing.

Asha : *i-think Map activity helps me a lot by getting ideas on my writing*

Ammar : *Using i-think Maps you can easy to get a lot of idea*

(Excerpt 1, Asha and Ammar : lines 46 and 47, 25 June 2018)

From the excerpt above, it is evident that i-think Maps aided pupils in their flow of ideas which helped improve their writing performance as they could pen their ideas systematically after filling in the i-think Maps templates. Here are samples of i-think Maps and the corresponding essay during the treatment lesson (see Figure 4.22).



515

FLOW Map

Thiba is my friend. She studying at Sekolah Kebangsaan Jalan Tiga /

Last Sunday, Thiba celebrated her eleventh birthday. Her family decorated their house."

Her mother baked a birthday cake and cooked chicken curry. Many friends came to the birthday party. They brought many presents."

Her friends enjoyed eating the chicken curry. After that, they sang the birthday song. They also played games. Some friends sang songs to her."

Her father promised to celebrate her birthday next year. Thiba felt happy and thanked her family. It was a happy and memorable day."

23/25 / f

91 words

Figure 4.22 Treatment lesson Flow Map and Essay 2, 3 May 2018

Based on Figure 4.22, it is apparent that the Flow Map impacted Dura's (pseudonym) writing as she was able to organize her ideas cohesively to narrate about 'A Birthday Party'. The events in the narrative were well sequenced and in logical order. She attempted to begin new ideas or events in new paragraphs which were properly linked. She also used interesting details and a new word such as 'memorable' (paragraph 5, line 3) to capture the interest of the readers. Correct punctuation was also used and words were spelled correctly too.

Secondly, the role of pupils was important as their thinking processes are goal directed which grows into elaborate networks through the flow of ideas during writing (Flower and Hayes, 1981). Pupils progressed through the hierarchical stages of planning, translating and reviewing which are flexible and recursive, where ideas can be sequenced or changed in order to accommodate the needs of the narrative (Flower and Hayes, 1981). As they underwent these thinking processes, pupils were able to write their essays based on their flow of ideas which they had sketched in the i-think Maps templates.

During the post-test, pupils completed the i-think Maps template (Flow Map, see Appendix M) provided by the researcher to help them plan their thoughts first before starting their test. Pupils referred to the i-think Maps template (Flow Map) constantly as they wrote the post-test essay (refer to Figure 4.4, p 74).

Most pupils were able to connect ideas logically in their correct sequence using the Flow Map template. They were also able to string words into varied sentences. Moreover, the sentences were sequential making the ideas coherent and cohesive. New paragraphs were written to present new ideas or events in their essays. Thus their writing performance showed improvement (refer to Figure 4.11, p 89).

Therefore, i-think Maps impacted pupils as they used them as platforms to develop their goals of writing based on their knowledge of the topic and long term memory (Flower and Hayes, 1981). Flower and Hayes (1981) also stated that “rhetorical choices through purposes, relationships, demands and language help the writing process but it is not clear how they do so or how they interact” (p. 366).

Suzie : Pupils’ involvement in a specific writing activity would influence their motivation to attend to the task. The use of i-think Maps templates engages pupils to the given writing task.

(Excerpt 2, Suzie: lines 28 - 30, 2 July, 2018)

The excerpt above explains that i-think Maps helped pupils’ flow of ideas during writing as they set and developed goals and sub-goals, which were the directions of their writing through flow of ideas, based on the writing task given to them (Flower and Hayes, 1981). This impacted pupils’ on-task behavior which helped them towards completing the composing task.

Suzie : Yes definitely...pupils loved the challenge and engaged in learning when they were able to use the i-think Maps individually and during group work. After using i-think Maps, pupils were able to express their ideas clearly and logically. They were also able to construct simple, correct sentences. I could see that the pupils were very interested and intent for the duration of the lesson.

(Excerpt 2, Suzie: lines 46 - 51, 2 July, 2018)

Furthermore, the excerpt above stated the differences the teacher noted in her pupils’ writing. Good writing performance required them to express their ideas clearly. Logical and coherent sequences of ideas that are well organized in their

essays are the products of thinking processes (Flower and Hayes, 1981).

Suzie : The i-think Maps help pupils to generate more ideas and improve their interest in writing. It helps them to focus on their flow of ideas which helps them to write better. Some pupils have shown a lot of improvement in their writing. They were able to organize their ideas for the writing task.

(Excerpt 2, Suzie: lines 62 - 65, 2 July, 2018)

The excerpt above reflected that pupils' writing performance had improved significantly after being exposed to i-think Maps. Flower and Hayes (1981) stated that "the act of composing or writing is a goal-directed thinking process" (p.377). Therefore, i-think Maps functioned as a "goal-directed thinking process" tool that helped pupils in their writing performance. Moreover, it is a process-based approach whereby pupils can review and monitor their writing as it is recursive and its processes are embedded within other components (Flower and Hayes, 1981).

Suzie ; But I can see that the use of i-think Maps impacted pupils' on-task behaviour which motivated them towards the topic or writing task.

(Excerpt 2, Suzie: lines 31 - 33, 2 July, 2018)

From the excerpt above, it is certain that pupils were more motivated and focused while using the i-think Maps templates, therefore their writing task was enhanced too (see Figure 4.23 & 4.24). They revised and edited their essays after receiving feedback from their teacher. Comparatively, before they were introduced to i-think Maps, they were unable to plan their writing well and were demotivated in their writing tasks. Here are samples of revised and edited essays during the process writing.

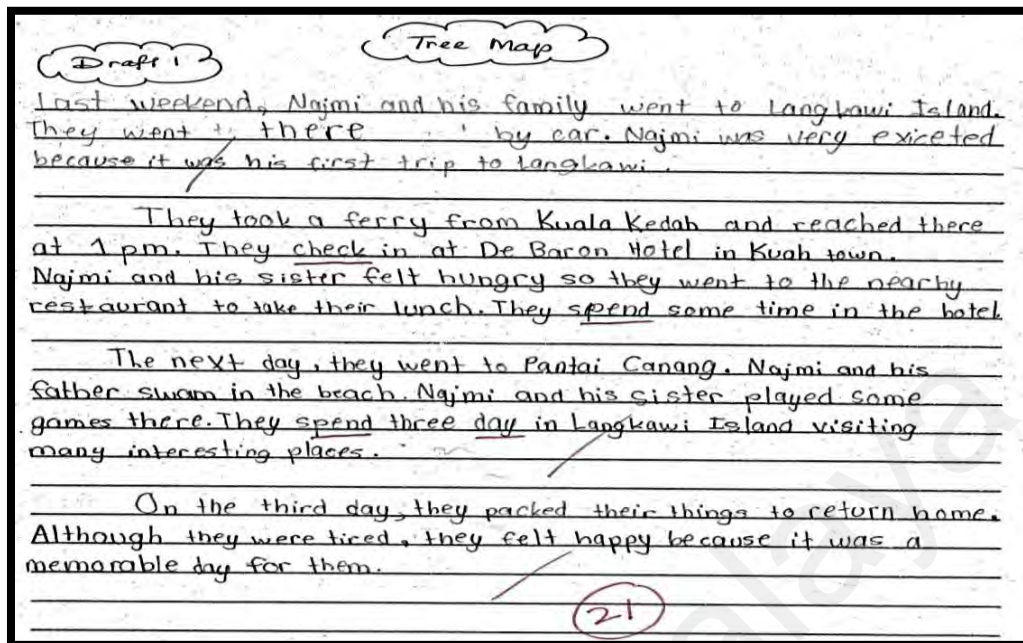


Figure 4.23 Process Writing Draft 1 “A Trip to Pulau Langkawi”

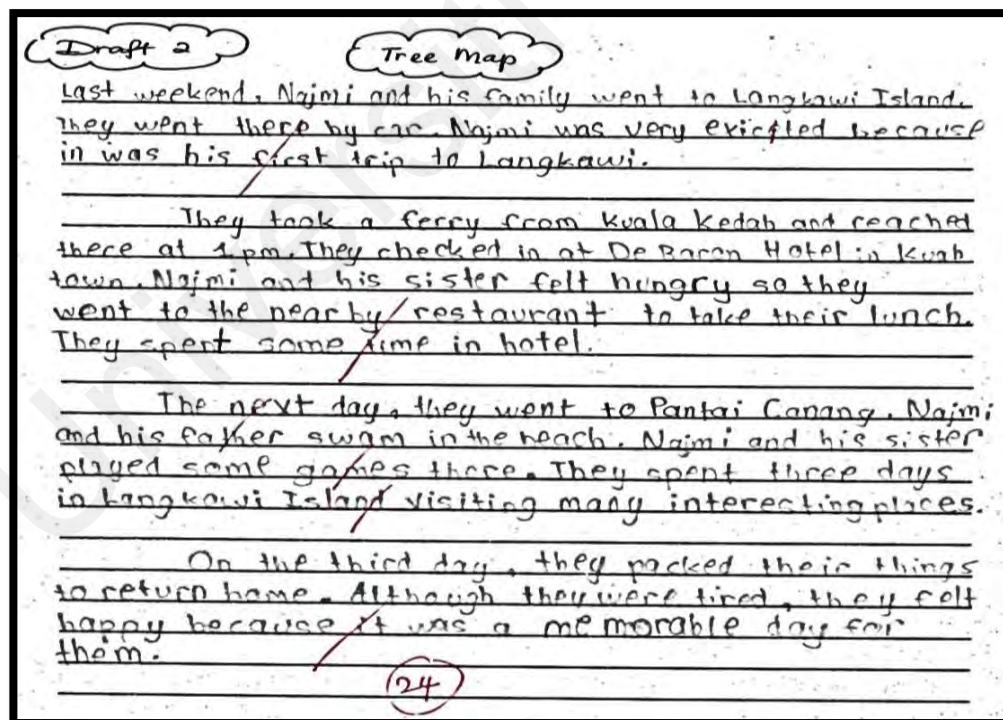


Figure 4.24 Final Draft 2 “A Trip to Pulau Langkawi”

Figures 4.23 and 4.24 portray clearly that pupils were motivated and focused in writing as they came up with at least two drafts as they received feedback from their teacher. They wrote their first draft after translating their ideas into their i-think Maps template. Then, after the teacher had marked the essays, they revised their previous drafts and produced their final essays.

Thirdly, the teacher's role as facilitator helped to scaffold pupils through prompt questions which assisted pupils to improve their writing skills. Moreover, teacher also modeled writing and gave feedback on their drafts which enabled them to progress in their writing performance (Hyerle, 2004).

Asha : teacher have discussion and get ideas and write sentence

Ammar : teacher explain and got ideas, write sentence correct, also understanding word

(Excerpt 1, Asha and Ammar: lines 24 and 25, 25 June 2018)

The excerpt above reinforces the important role played by the teacher in facilitating pupils' writing performance as they are the pupils' best role model for writing. Moreover, the feedback provided by the teacher helped them to revise and edit their essays in the process writing approach (Flower and Hayes, 1981). Therefore, they were given ample time and opportunity to reassess their writing goals and edit their essays several times until they were correctly written (Appendix H1-H5). Flower and Hayes (1986) also clarified the difference between novice and expert writers by explaining how their working memories and long-term memories affected writers' abilities to make basic or important corrections in their essays. Thus, pupils' focus on how to evaluate quality in their writing was also another important aspect of the cognitive processes of writing.

Suzie : Yes, they have definitely improved. The learning style using i-think Maps and teacher's instructional approach are main contributors to a student's flow of ideas and writing performance. Of course, the weak pupils needed more attention and guidance in expressing their ideas and drafting their essays.

(Excerpt 2, Suzie: lines 55 - 59, 25 June 2018)

The excerpt above shows that i-think Maps provided teachers and pupils with a visual language for transferring both thinking and writing skills into every content area (Hyerle, 2004). It is also evident that the scaffolding role of the teacher helped pupils improve their writing performance. The teacher's role can be clearly seen in Table 4.3 (p. 81-82).

Suzie : It helps them to focus on their flow of ideas which helps them to write better. Some pupils have shown a lot of improvement in their writing. They were able to organize their ideas for the writing task.

(Excerpt 2, Suzie: lines 63 - 64, 25 June 2018)

According to Hyerle (2004), "the quality of writing improves when pupils use tools and strategies that help them ponder and wrestle with language" (p. 81). Moreover, Flower and Hayes (1981) also stated that writers engaged in cognitive activities throughout the composition process which included generating ideas, planning, reviewing, transcribing, revising, setting goals, and idea organization.

4.5 Chapter Summary

This chapter has discussed results that were obtained from several instruments used in this pre experimental study of one group pre-test post-test design on the impact of i-think Maps on the flow of ideas and writing performance of Year 5 pupils. By triangulating the data gained through pre-test and post-test scores, observation checklists, structured interviews and document analysis, the researcher made use of multiple sources to provide corroborating evidence to support findings (Cresswell, 2007). Ridenour and Newman (2008) support triangulation as they believe that “the more sources a researcher uses the more likely he or she is to have a full and rich interpretation” (p. 58).

The findings from the qualitative data namely observation checklists, structured interviews, analysis of i-think Maps templates and pupils’ essays show that, on the whole, i-think Maps helped pupils from Year 5 Ibnu Sina in their flow of ideas.

The statistical analysis and comparisons using the Paired Samples t-Test analysis of the pre-test and post-test scores in the SPSS program showed higher mean scores in the post test which suggested that when pupils used i-think Maps during their writing, there was an impact in their writing performance.

However, since this pre-experimental: one group pretest post-test study was conducted on an experimental group without a control group and the pupils were selected non-randomly, there are external and internal validity and reliability issues that influence the conclusion of this study. Therefore, in the final chapter, interpretations and implications suggested by these results will be presented.

CHAPTER 5

DISCUSSIONS AND CONCLUSIONS

5.1 Introduction

This study explores the impact of i-think Maps on the flow of ideas and writing performance of Year Five pupils. This final chapter has been divided into four sections. First, a summary of the study revisiting the methods namely pre-test and post-test, two randomly selected pupils' and participant teacher's structured interviews, observation checklists and document analysis. The second section presents the researcher's key findings with regards to the two research questions. The third section provides recommendations for action and further studies. Finally, the researcher concludes the chapter with personal thoughts and reflections.

5.2 Summary of Study

This study examined the impact of i-think Maps on the flow of ideas and writing performance of Year Five pupils. It was carried out using a non-random pre-experimental: one group pre-test and post-test design involving a class of twenty eight Year Five pupils from a National school in Kuala Lumpur for three months namely March – May 2018. The one group pre-test and post-test design was chosen for this study because the researcher wanted to evaluate the effectiveness i-think Maps' intervention on the flow of ideas and writing performance of Year Five pupils.

Throughout the study, which was carried out for ten weeks, the researcher conducted an intervention of five treatment lessons for the non-random group of twenty eight pupils from Year Five Ibnu Sina.

The researcher also carried out an essay writing pre-test before the treatment lessons began and a post-test at the end of the tenth week. During the post-test, two i-think Maps templates, namely the Circle Map and the Flow Map were provided for the pupils to plan their essays and also for the researcher to gauge whether pupils knew the most suitable i-think Maps template which they could use to write down their flow of ideas. Moreover, the researcher also wanted to see whether the flow of ideas were coherent, well organized and correctly sequenced. Most pupils chose the Flow Map template to write down their ideas systematically and cohesively.

The researcher also examined pupils' and teacher participant's structured interview responses, counter checked two observation checklists and finally analyzed pupils' work namely their i-think Maps templates and written essays.

Therefore, in this chapter, the researcher will attempt to summarize key findings and discuss their implications on the impact of i-think Maps on the flow of ideas and writing performance of Year Five pupils.

5.3 Research Question 1: How do i-think Maps help Year Five pupils' flow of ideas during writing?

To answer Research Question 1, three themes were identified using thematic content analysis (Castlebury and Nolen, 2018). The three identified themes were the role of i-think Maps, the role of pupils and the role of teachers.

5.3.1 Theme 1 – Role of i-think Maps

The role of i-think Maps is important as they are the cognitive tools that aid and scaffold pupils in the planning stage after the topic for the guided narrative essay was given by the teacher. According to Hyerle (1995), these new visual tools called Thinking Maps would enable one to “construct, organize, assess and convey knowledge” (Hyerle, 1995; p. 85) even better than a graphic organizer. He studied

peoples' thought processes and established that "spatial formats which address every thinking process could be utilized to generate and organize thoughts and ideas, either on paper or by using software" (Hyerle, 1995, p. 85).

In the Classroom Observation Checklist (Appendix B) and i-think Maps Checklist (Appendix F), important roles of i-think Maps were highlighted. The most important roles of i-think Maps are that they were generated by the pupils who were able to transfer their flow of ideas into the i-think Map templates at the planning and editing stages (Seng, Tan, Abdullah and Mostafa, 2017).

There were evidences on the use of all four i-think Maps namely circle, bubble, tree and flow maps during the intervention of five treatment lessons. Moreover, pupils could explain why they used a particular i-think Maps template to write down their flow of ideas in correct sequences.

In a study by Yunus and Chien (2016), pupils who used Thinking Maps were able to plan what to write, had a deeper understanding of the writing topics and employed creativity in their writing. During the post-test, the Flow Map templates were used to plan their writing. Since the Flow Map is structured with boxes to show the flow of ideas, pupils were cognitively conditioned to fill it up with ideas that are sequential, coherent and well organized which was in line with the storyline of the guided narrative essay.

Pupils who were interviewed, Asha and Ammar stated that they preferred to begin their writing by using i-think Maps to get their flow of ideas in the planning stage. Both of them agreed that they liked using these i-think Maps and were comfortable using them in the planning and drafting stages. In addition, they reiterated that the i-think Maps helped them to generate ideas for their writing task (Hyerle, 1995; Ojima, 2006; Hasan and Akhand, 2010; Naqbi, 2011).

In the interview with the teacher participant, she mentioned that in the beginning [of the treatment lessons] it was very difficult for the pupils to make connections between writing and using i-think Maps to map out their ideas on the provided templates. However, after several practices, these pupils were able to complete the i-think Maps templates confidently (Sovakandan, Jaganathan and Husain, 2018).

Regarding the benefits of using i-think Maps, the participant teacher stated that by using the i-think Maps, pupils were able to express their ideas clearly and logically. They were able to construct simple, correct sentences during their writing practices and their post-test (Zhou, 2009). Previously, before the intervention of using i-think Maps was administered, pupils produced ordinary sentences with disorganized ideas.

Based on the structured interviews with the two pupils and the participant teacher, it is therefore evident that i-think Maps has helped pupils in their flow of ideas during the planning stage and while drafting their essays (Reima, 2009; Davies, 2011; Omar and Al Bakri, 2016).

5.3.2 Theme 2 – Role of Pupils

The role played by pupils was pivotal because they were at the recipients' end of the intervention using i-think Maps. The pupils were important key players in this study as they needed to be involved in “distinctive thinking processes” during the writing activity (Flower and Hayes, 1981). As pupils took part in the brainstorming and group discussions, they wrote out their flow of ideas into the i-think Map templates (Omdivari and Abedianpour, 2018). According to a study by Karim, Abu and Khaja (2016), brainstorming and mind mapping activities helped pupils generate ideas for their writing task.

Hyerle (1995) also remarked that the “consistency and flexibility of each of the Thinking Maps promotes student centered cooperative learning, concept development, reflective thinking, creativity, clarity of communication, and continuous cognitive development” (p. 8).

The Year Five Ibnu Sina pupils were able to use the i-think Maps templates independently and were focused on completing them. Previously, pupils were aimless as they did not have a cognitive tool to capture their ideas in a systematic manner (Ganapathy and Kaur, 2014). More importantly, pupils connected ideas logically in the correct sequence in their i-think Maps templates which they later used as a cognitive guide while writing their post-test essays (Yunus and Chien, 2016).

The researcher also examined the interview responses given by two randomly selected pupils from Year Five Ibnu Sina who reiterated that the most difficult part of writing for them was getting ideas. However, after using i-think Maps during the treatment lessons, both pupils agreed that the i-think Maps helped them with the flow of ideas in the planning stage of writing (Sovakandan, Jaganathan and Husain, 2018).

The participant teacher mentioned that i-think Maps helped pupils to visually organize their ideas after brainstorming sessions and group discussions (Liu 2011, Negari, 2011; Leopold, 2012).

She also reiterated that since pupils were able to generate more ideas, they actively participated in completing the i-think Map templates by writing down their flow of ideas in them (Wirtz, 2015; Yunus and Chien, 2016; Hatakeyama, 2018).

5.3.3 Theme 3 – Role of Teachers

The teacher scaffolded pupils in the planning stage by conducting brainstorming sessions and monitored pupils as they took part in group discussions after the guided narrative essay topic was given. According to Asmawi (2014) cited in Balakrishnan et al (2014), scaffolding is an important strategy used by teachers and peers in the planning stages of writing. The teacher also played the role of a facilitator who assisted pupils in their thinking process by asking relevant prompt questions as they completed the i-think Maps templates.

The important role played by the teacher included explaining the lesson, its goals and i-think Maps clearly to pupils. Furthermore, the teacher also modeled writing for pupils and displayed a positive attitude towards the i-think Maps (Hyerle, 2004). The teacher also encouraged pupils by calling on all of them equally and provided feedback to improve their writing performance. Hence, process writing became the main focus of the Year Five Ibnu Sina writing classroom instead of the written product. (Flower and Hayes, 1981; Tran, 2007; Ferris, 2011; Giridharan and Robson, 2012).

Apart from that, the two pupils who were interviewed, Asha and Ammar remarked that the teacher helped them by conducting brainstorming sessions, prompting them with questions to get ideas, explaining difficult vocabulary, modeling sentence structures and giving corrective feedback about their essays (Betancur and King, 2014; Cho and Kim, 2017).

In addition to that, the structured interview with the participant teacher, Suzie also highlighted the role played by the teacher in helping pupils with their flow of ideas through i-think Maps (Chien, 2012; Stapa and Majid, 2017). Teacher's

strategic instructional approach using the i-think Maps helped them to be engaged in their writing tasks (Tangpermpoon, 2008).

Finally, analysis of i-think Maps templates showed that most of the pupils were able to complete them accurately as the teacher used prompt questions to guide pupils, facilitating them to think about the most suitable ideas according to the narrative essay topic during group discussions (Kibbler, 2011, Pessoa, Mitchell and Miller, 2018). These prompt questions helped shape pupils' ideas which they transferred into the i-think Maps templates (Alamis, 2010; Ferris, 2010; Lee, 2011).

5.3.4 Summary of Flow of Ideas through i-think Maps

From the three themes derived from the qualitative data analysis discussed above, findings showed that pupils were keen in using i-think Maps which generated ideas and formed the content for their writing (Hyerle, 1995; Al-Shaer, 2014). The researcher's findings supported a positive impact of i-think Maps on the flow of ideas from Year Five Ibnu Sina pupils which served as a cognitive tool in pupil-centered learning (Hassan and Akhand, 2010; Davies, 2011; Hyerle and Alper, 2011).

The data also revealed how the use of i-think Maps enhanced the flow of ideas for pupils, resulting in enriching pupils' writing experiences (Chapman, 2013). Pupils were able to complete their i-think Maps templates namely the Flow Map individually during their post-test, while thinking about and planning their ideas, so that, they will be in a well-sequenced, properly organized and coherent manner. This is a positive step towards pupils using i-think Maps as a visual tool to aid in planning their writing.

Pupils were greatly motivated because the writing task which they perceived as difficult was made easier as they brainstormed and transferred their ideas into the i-think Maps templates.

A study by Hasan and Akhand (2010) stated that Bangladeshi pupils who completed their essays using the process approach had difficulty organizing and sequencing their ideas. As a result, they were unable to produce good essays which were the desired results. Hence, they contended that it is pertinent that “guided brainstorming diagrams” or mind maps should be used during the process writing approach (Flower and Hayes, 1981) to help pupils in sequencing their ideas in a well-organized manner before writing their first draft.

Pupils were also more confident to use the i-think Maps under the guidance of their teacher who scaffolded pupils throughout the writing process. They experienced freedom of expression and autonomy in their writing tasks as they brainstormed and discussed in groups before starting to write their first draft (Maarof, Yamat and Li, 2011).

Based on pupils’ responses during the structured interview, the i-think Maps helped improve pupils’ flow of ideas during the planning stage (Manham and Nejadansari, 2012; Lee, 2013; Mogahed, 2013). Pupils acknowledged that brainstorming sessions and group discussions provided them opportunities to work cooperatively and to discuss the flow of ideas for their writing (Fong, 2012). Therefore, the i-think Maps impacted pupils’ flow of ideas which they organized in a proper sequence during the planning stage of writing.

However, considering internal and external validity issues that are posed by the pre-experimental: one group pre-test post-test study which was without randomization, the positive impact of i-think Maps in pupils' flow of ideas is limited to the Year Five Ibnu Sina pupils only and cannot be generalized to all Year Five pupils.

5.4 Research Question 2: Is there an impact in Year Five pupils' writing performance after using i-think Maps?

In order to answer Research Question 2, pre-test on writing was administered on the non-random pre-experimental group during the first day of the study and post-test at the end of ten weeks after the intervention was carried out.

Both the pre-test and post-test scores were recorded before making statistical analysis and comparisons using the Paired Samples t-Test analysis in the SPSS program. The Paired Samples t-Test compared two means that were from the same tests namely pre-test and post-test.

According to Chua, "the purpose of the test was to determine whether there was statistical evidence that the mean differences between paired observations on a particular outcome was significantly different from zero" (Chua, 2013).

Since this was a repeated measures analysis, using pre-test and post-test, the same pupils' writing scores were measured twice. There was a high degree of correlation between the two sets of scores which was 0.958. The paired t-Test showed that there was a significant difference in scores with a degree of freedom of 27 and t value of -9.295. The p-value was 0.000, which explained that the results were seemingly significant at 1%. These results suggested that when pupils used i-think Maps during writing, there was a significant improvement in their writing performance.

In addition, comparisons using the Paired Samples t-Test analysis in the SPSS program (Table 4.8), suggested a significant difference in the scores for pre-test ($M=7.71$, $SD=5.643$) and post-test ($M=10.57$, $SD=5.196$); conditions $t(27) = -9.925$, $p = 0.000$. Higher mean scores for the post-test suggested that there was a significant difference in pupils' writing performance as they had achieved better scores in their post-test.

Nevertheless, this significance can only be applied specifically to the Year Five Ibnu Sina pupils as they were not randomly selected for this study. Moreover, in this pre-experimental: one group pre-test post-test design, only one class of pupils that is Year Five Ibnu Sina participated in this study without a control group.

The conclusion that can be drawn from the SPSS analysis indicates that although the use of i-think Maps did have a seemingly significant and positive effect on pupils' writing performance it may not be the sole reason for the pupils' increase in their post-test scores. The reason is because there may be extraneous variables such as pupils' maturation or self-motivation, parental or siblings' guidance at home or tuition classes that may have influenced pupils' higher post-test scores.

Nevertheless, these findings revealed that the Year Five Ibnu Sina pupils had produced better quality essays and had improved on their individual, personal scores on the given writing task and genre. This suggested a positive relationship between i-think Maps and writing performance of Year Five Ibnu Sina pupils.

5.4.1 Summary of i-think Maps and Writing Performance

The findings of this study indicate process writing produces a significant improvement in the final product of pupils' writing (Boaz, 2011; Bayat, 2014). The use of i-think Maps proved to be an effective tool to develop pupils' organization of ideas which in turn helped to improve their writing performance. They understood

the ideas which they illustrated in their i-think Maps templates better and were more confident in their writing tasks. The analysis of pupils' essays showed that during writing, most of them developed ideas logically and in the correct sequence based on their flow of ideas written in the i-think Maps templates (Hyerle, 2001).

The structured interview with the participant teacher revealed that the pupils concentrated on writing down their ideas carefully during the writing task. She also reiterated that some pupils showed a lot of improvement in their writing as they were able to organize their ideas sequentially in the i-think Maps templates for the writing task (Al Naqbi, 2011). They also organized their ideas during brainstorming sessions and then expanded their ideas during the writing task (Ganapathy and Kaur, 2014).

In addition, the interview with two pupils indicated that they relied heavily on cognitive strategies (Liu, Frankel and Roohr, 2014), such as i-think Maps templates (Hyerle, 1995) which served as cognitive tools for pupils to plan their flow of ideas before commencing their writing tasks.

The process writing approach is based on the recognition that the writing process is cyclical and recursive rather than linear (Flower and Hayes, 1978). The focus shifts from the text to the students, who can move back and forth from one stage to another when they write in order to edit or revise their writing before producing the final product (Flower and Hayes, 1978; Agustiana, 2016). This is because pupils are able to gather facts from their long term memories and group ideas together according to their writing purposes and audience. They are able to simultaneously write and review their essays for new ideas or evaluate the effectiveness of their previous ideas recursively (Flower and Hayes, 1981).

Prior to this, pupils' responses to writing were unimpressive and weak. Implementing the i-think Maps impacted on pupils' flow of ideas and writing performance as they produced better essays after receiving feedback from their teacher. Apart from this, pupils reviewed their essays and edited them, providing an opportunity for them to learn from their teacher and peers (Flower and Hayes, 1978; Hassan and Alkhand, 2010).

This study on the impact of i-think Maps on the flow of ideas and writing performance has similarities with studies conducted by Nurlaila (2013) and Adi Purnomo (2014), who carried out researches on the impact of mind mapping on the writing skills of their pupils. After using mind maps, their pupils' writing scores were significant statistically and they were also able to comprehend the writing lesson.

Likewise, the post-test scores exhibited an increase in the number of pupils who scored Excellent (EX), Good (GD) and Satisfactory (ST) scores when compared to their pre-test which was from 9 (32%) during the pre-test to 24 (85.7%) in the post-test which denotes an increase of 53.6%. However, since this study is pre-experimental focusing on only one group of pupils, there could be other extraneous variables that may have contributed to the improvement in their writing performance. Hence, i-think Maps may not have been solely the reason for the pupils' increase in scores. Therefore, the improvement in writing performance is solely the achievement of the pupils of Year Five Ibnu Sina and cannot be generalized to all Year Five pupils.

5.5 Implications for Teaching and Learning

This study reveals that i-think Maps incorporated in the writing lessons help to improve the flow of ideas and writing performance of pupils. As such, teachers need to be aware of the advantages of using i-think Maps in the English Language writing classroom. This is because major implications and pedagogical recommendations need to be discussed in order to use this strategy during the English writing lessons in the Malaysian classrooms.

Pupils who have gathered their ideas through cognitive tools such as i-think Maps have the foundation laid for process writing approach because they can rely on these ideas to write their drafts and edit them by going back to what they have written recursively until they have produced their final essays (Flower and Hayes, 1978; Nordin, 2017).

Process writing practice such as drafting and editing can help pupils improve their level of proficiency in writing (Flower and Hayes, 1981; Kolade, 2012). Here, teachers need to provide pupils with sufficient language feedback and scaffolding as well as frequent writing practice (Hyerle, 2004). The teachers' overt classroom instructions or feedback on pupils' writing enables them to make modifications with confidence and competence during the composing process (Maarof, Yamat and Li, 2011). This is because focus on the flow of ideas, clarity and coherence are crucial in the writing performance.

After receiving feedback from the teacher, pupils edit their writing several times to produce the final and correct versions of their essays (Flower and Hayes, 1978). This definitely inculcates pupil-centered learning and increases confidence in pupils to write as they plan, translate and revise the goals and sub-goals in writing (Flower and Hayes, 1981; Tan, Emerson and White, 2017).

In order to help pupils who are weak in writing, policy makers and teachers should conduct writing workshops emphasizing on the use of i-think Maps to inculcate in pupils' minds that writing is a process and not just another piece of exam oriented skill. (Graham, Keown, Kihara and Harris, 2012; Troia, Lin, Cohen and Monroe, 2011). Since previous studies focused on writing workshops for elementary school and university students, it is hoped that primary school pupils can be given this exposure too.

Moreover, pupils' mindsets must be exposed to the fact that revising and editing their essays until they are able to produce a good piece of writing is permitted and accepted in the Malaysian English Language classroom (Huwari and Aziz, 2011). This is because the cognitive processes of writing actively takes place in the minds of the writer as they edit their essays until they are able to produce the correct version of their writing (Kaur, Ganapathy and Sidhu, 2012). In the current situation, pupils are allowed to edit their essays only once as the teacher is impatient to give them the next writing assignment to complete the syllabus on time.

The process writing approach should be introduced in the Malaysian English Language primary classroom, so that pupils can be expressive and creative in their writing from a young age. Sadly, writing activities are solely designed for exam purposes only (Lee, 2018) which is purely and restrictively the product approach. This makes writing a very boring, mundane and menial task for pupils and therefore, does not allow them to enjoy creative expressions of their thoughts and ideas through writing as they ought to. Pupils are not given the space or time to share their written thoughts with their teachers and peers because of time constraints (Hanauer and Liao, 2016).

Finally, teachers should make an effort to look for essay topics that pupils can connect with and find them interesting and meaningful for them to write on. This is because the current writing topics produced by the Malaysian Examination Syndicate (Lembaga Peperiksaan Malaysia) for the UPSR examination are stereotyped and are neither appealing nor personalized for pupils. According to Treadwell (2010) the choice of topics should be captivating for pupils to write on. When students are provided with the options to write on topics that are related to their interests and needs, they are motivated to respond willingly and work cooperatively in writing various types of genres that will help them academically (Boaz, 2011).

5.6 Limitations of the Study

The pupils in this study are a non-random sample of twenty eight participants from a Year Five class. Therefore, this pre-experimental: one group pre-test post-test design has its internal and external validity issues which the researcher attempted to address to the best of her capacity. As such, the findings of this study may not be a representative of the general Year Five student population as a whole, but, can be specifically applied to the Year Five Ibnu Sina pupils only.

Secondly, this study was conducted on a class of pupils from Year Five Ibnu Sina without a control group. Therefore, i-think Maps alone might not have contributed towards the flow of ideas and writing performance of the pupils. There could also be extraneous variables such as pupils' maturation or motivation, parental or siblings' guidance at home or tuition classes which may have contributed to the increase in the post-test scores. However, since these Year Five pupils were not streamed in their classes according to their academic excellence and were of average

proficiency in their English Language, the researcher contends that issues of trustworthiness and biasness were addressed as much as possible in this study.

Thirdly, although the higher mean score for the post-test suggested statistical significance in relation to the pupils' writing performance after using i-think Maps, the non-random selection of pupils in the pre-experimental: one group pre-test post-test design, does not allow for a fool-proof validity of the findings in this study.

Fourthly, the researcher experimented on four i-think Maps only instead of all eight. Therefore, the impact of incorporating all eight i-think Maps on writing could not be ascertained.

Finally, only a cycle of intervention consisting of five treatment lessons using i-think Maps were carried out which does not serve as a sufficiently adequate measure for assessing the pupils' writing performance as it is a skill which progresses over time with repeated practice.

5.7 Recommendations

There is a dearth of research on writing skills but little is known about the use of i-think Maps on the flow of ideas and writing performance of Malaysian primary school pupils.

Firstly, further studies or insights into the flow of ideas and writing performance using i-think Maps would enable researchers and language instructors to employ methods or techniques best suited for the improvement of writing skills amongst primary school pupils.

However, random selection of pupils for a quasi-experimental study using i-think Maps is needful to avoid validity and reliability threats. In addition, experimental and control groups of pupils should be used as samples instead of a one

group experiment carried out over a longer period of time. Therefore, additional research is warranted to establish more conclusive results in helping pupils cognitively through i-think Maps to improve their flow of ideas and writing performance in the ESL classroom.

5.8 Conclusion

The inability of pupils to write skillfully in the Malaysian English Language classroom motivated this study. Therefore, the main purpose of this study was to find out the impact of i-think Maps on the flow of ideas and writing performance of Year Five pupils using a pre-experimental: one group pre-test post-test design. The researcher conducted an intervention consisting of five treatment lessons using i-think Maps for ten weeks which showed improvements in pupils' flow of ideas. The treatment lessons carried out with the pupils included the use of i-think Maps templates, drafting and editing essays in the process writing approach.

The pre-test and post-test were conducted before and after the treatment lessons. The non-random group of Year Five pupils achieved better writing scores in their post-test with an increase of 53.6% in passes. Moreover, the mean score of the post-test showed an increase which suggested statistical significance. Nevertheless, since only one class of pupils participated in this study without a control group, this pre-experimental design needs to address internal and external validity issues as well (Cohen, Manion and Morisson, 2007). Therefore, it is concluded that i-think Maps alone cannot solely impact pupils' flow of ideas and writing performance as other extraneous variables might have contributed towards the improvement of pupils' writing.

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