The Effects of I-Think Maps on ESL Learners' Reading Comprehension in A Primary School Setting

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Abstract: In a formal context of learning English, reading is an integral skill and primary source for learners to obtain language input. ESL practitioners across the world are thus reported to experiment with numerous strategies to facilitate reading comprehension of learners with varying proficiency levels. One of the strategies is through the use of graphic organizers such as I-Think Maps, which is also known as Thinking Maps. The organizer is a set of visual tools comprising eight cognitive processes to foster reading. This study aims to investigate the effects of I-Think Maps on learners' reading comprehension when it is integrated into the reading process and to obtain feedback from the research participants on the classroom intervention experience. Four upper primary school pupils from Year 4 (age 10) and Year 5 (age 11) from the same classroom at a rural school were selected as research participants. The research data included the learners' homework as well as a semi-structured interview. Results from the study indicated that the integration of I-Think Maps in the reading lessons led to no significant improvement in the participants' reading comprehension. The study, however, managed to capture positive feedback on the participants' experience in learning vocabulary and promoting thinking skills. Based on the findings, it is suggested that I-Think Maps as a tool has the potential to be further explored to determine the possibility for its implementation in ESL reading lessons.
Keywords: I-Think Maps, reading, comprehension, primary, vocabulary, thinking skills.

Introduction

In achieving certain mastery level of English, second language speakers need to acquire the four main language skills: listening, speaking, reading, and writing. Reading, as a receptive skill, is arguably the most essential as it is a potent skill that leads readers to knowledge, insight and perspective. Being able to read efficiently is important for successful academic achievement (Alvermann, 2002; Grabe, 2010; Bernhardt, 2011), considering that mastery of the skill allows access to plethora of information which in turn increases knowledge.

Thus, reading is the main source to all knowledge (Guthrie, 2004) as a process in which we identify, interpret, and perceive written and printed materials. As such, reading cannot be

separated from comprehension as it is how we understand the meaning of the written materials through the use of particular strategies.

Past studies (e.g. Baldi, 2005; Burt and Peyton, 2003) suggest that learners struggle with their academic reading materials and most of them are reported with below average reading proficiency. Reading struggle affecting Malaysian learners are related to understanding academic texts (Jamaliah and Faridah Noor, 2001; Ahmad Mazli, 2007; Isarji and Ainol Madziah, 2008; Samsiah, 2011) due to their inability to understand the context, recognise unfamiliar words, and negative attitude among other reasons. The situation often leaves them to find reading less interesting, highlighting a need to help these learners to improve their reading skills.

There is sufficient evidence to demonstrate positive effects of the use graphic organizers on thinking skills (Ainon and Intan, 2016) and reading comprehension (Hyerle, 2000; Woodford 2015) even in an English as a foreign language (EFL) context (Hofland, 2007; Siriphanich and Laohawiryanan, 2010; Christodoulou, 2010; Liu, Chen and Chang, 2010; Kim and Kim, 2012). More specifically, graphic organizers help learners to extract, remember and retrieve information from reading texts successfully (Novak, 2006; Gill, 2007; Smith, 2010; Dias, 2011 and Hashemain *et al.,* 2014).

Theoretical Framework

I-Think Maps is a form of graphic organizers that assists learners to remember, recover and transfer information, and connect ideas, resulting in better reading comprehension (Hoffman, 2003). The activities fit into Ausubel's (1960) theory of learning which is known as subsumption that is defined as a process "by which new information enters the consciousness and is directed or organised to fit within an already existing learning category". Through I-Think maps, learners are facilitated to re-organise and connect new ideas with pre-existing ideas.

The use of I-Think Maps is also underpinned by the theory of dual-coding by Paivio (1971). When a person recalls information, it is connected by two isolated processing systems, namely the linguistic and non-linguistic systems. One system is verbal and the other is non-verbal (visual representation). When linguistic and non-linguistic visual depictions are combined, learners improve their cognitive development as well as comprehension, resulting in learning outcome improvement (Woodford, 2015).

Past related studies

Several studies were carried out on the use of graphic organisers in improving pupil's comprehension. Phantharakphong and Pothitha (2013) recruited 18 students in 10th grade of Demonstration School of Khon Kain University (Suksasart) and reported that using concept maps help in improving students' reading comprehension by helping them to link ideas in the texts. Meanwhile, studies conducted among middle school students showed that Thinking Map was helpful in gaining vocabulary knowledge and necessary comprehension skills (Woodford, 2015). Another study was carried out by Omar (2015) on pre-medical Saudi students to investigate the use of computer-based concept maps. The participants reported positive view and agreed that the use of concept maps had made reading more interesting. Similar research on online concept mapping was done in American University in Cairo (Ellozy and Mostafa, 2010). From the study, it was found that the participants were able to make connection with what they read. However, they were reported to argue that E-mapping was time consuming.

A quasi experimental study by Puteri *et al.,* (2017) demonstrated that Form Four students in the east coast of Peninsular Malaysia gained positive results in their reading test and they admitted to having positive perspectives on the use of graphic organizers.

Research on thinking maps also includes the area of writing. Gallagher (2011) for instance showed that thinking maps, when used among undergraduates in an advanced nutrition course, helped them with their organisation of writing ideas which in turn increased the clarity of writing. Cooks and Sunseri (2014) on the other hand investigated the same area but with 8 learners from Grades 3 through 5 and found similar findings as the participants' writing was reported to be more organised and improved when Thinking Maps were used.

Thinking maps had also been utilized in the teaching of literature in the Malaysian setting. Ainon and Intan (2016) who studied trainee teachers of the Teaching of English as a Second Language (TESL) programme found that the students were engaged in critical thinking when Thinking Maps were employed in the lesson and students admitted to finding it beneficial and effective in language learning.

Based on the literature, a limited number of studies had examined the use of thinking maps or more commonly known as "I-Think maps" in Malaysia as a strategy to improve pupils' reading comprehension. This study thus attempted to look at the relationship between the use of I-Think maps and reading comprehension among Year 4 and 5 primary school learners. Thus, the present study intends to answer the following research questions:
1) What is the impact when integrating I-Think Maps during the reading process on pupils' reading comprehension?
2) How do pupils perceive the integration of I-Think Maps into the reading process?

Methodology
Research Design
This study was an instrumental case study to generate in-depth and multifaceted understanding about reading comprehension in an authentic context by attempting to report how integrating I-Think maps in reading lesson would affect reading comprehension in an ESL classroom.

Participants and Setting
Participants of this study comprised of four upper primary ESL learners who were studying in a school located in the district of Belawai, a rural area in Sarawak. The entire school consisted of 28 pupils and the majority were of Iban ethnic group. Three research participants were Ibans and one Melanau. The participants mostly used Iban language to communicate within the community and with their peers in school. The Melanaus formed a minority group in the school and used the Malay language or Iban language to communicate with their peers even though their first language is Melanau. They could communicate in the Iban language because they learnt it as an additional language. The pupils in the school would only speak English with their English teacher either within the classroom or outside in the school compound. Thus, English was considered a third language which they rarely used outside the school setting. Due to the lack of exposure to and practising the language, most of the pupils in the school had difficulty mastering English. They struggled even with basic literacy skills and ranged between average and weak in reading and were often found to struggle to understand the content of reading text. These observations were made based on their past year test results in the reading comprehension section as well as their performance in reading class.

Research Procedure

This study was carried out in 10 lessons spanning one and a half month. There were five reading texts used during the intervention and each reading text took about two lessons to finish. In the first lesson, the teacher would go through the text with the pupils. During the reading process, she would integrate the I-Think maps into the reading. During the second lesson, the teacher reviewed the story using I-Think maps. The participants needed to answer five multiple choice questions based on the story and to do a sequencing activity. After the end of the intervention, the participants were interviewed to get their response on the use of I-Think maps in the reading lessons.

Research Instruments

For this study, data were in the form of pupils' own work and later, interview. The pupils' works were reading texts and comprehension questions given to them after every reading text. The texts were taken from "Critical Thinking & Classic Tales Fables". It was a teaching resource written by Marion Hindes and Sally Switzer and published in 2003 by Remedia Publications. The book contained 12 fables. Five fables were chosen as the reading texts for the pupils. The reading readability of each reading text was tested using the free text readability consensus calculator from www.readabilityformulas.com. The free automatic readability checker from this website cross-checked the readability of the five texts using seven popular readability formulae by calculating the average grade level, reading age and text difficulty of the reading text.

The readability formulae were Flesch Reading Ease Score, Flesch-Kincaid Grade Level, Gunning Fog, The Coleman-Liau Index, The SMOG Index, Automated Readability Index and Linsear Write Formula. For each reading text, all pupils were given a set of five multiple choice questions and a sequencing activity. All questions were based on the first two levels of Bloom's Taxonomy of the cognitive domain, namely knowledge and comprehension. The multiple-choices were based on the texts and pupils could retrieve the answers from the text. The sequencing activity was at the second level of Bloom's Taxonomy which was comprehension. For the first reading text, pupils were asked to number the sentences in the story's order. However, for the second up to the fifth reading text, the pupils were asked to rewrite the sentences given in correct order or draw the sequence of the story using a flow map.

Interviews

Interviews were conducted after the intervention to investigate pupils' perceptions towards the integration of I-Think maps during reading lessons. Generally, they were asked the following questions:
1) Do you like using I-Think Maps during reading lessons? Why?
2) What have you learnt from using I-Think Maps in the classroom?
3) What is the reason you could not get the multiple choices correct?
4) Did using I-Think maps/ flow map during reading lesson help you in understanding the story?
5) Would you use I-Think maps again next time?

Data analysis

In this study, the multiple-choice questions were analysed for the number of correct responses by learners. Learners were given 1 point if they could answer correctly. The second data collected was in the form of interview and were transcribed and analysed qualitatively and categorized using themes to answer the research question addressed in the study.

Findings

The aim of this study was to investigate how the integration of I-Think Maps helped the pupils in improving reading comprehension. The first research question was to investigate the impact of I-Think maps when integrating I-Think Maps during the reading process to improve pupils' reading comprehension. The result in Table 1 shows the number of correct items pupils achieved for each reading text.

Table 1. Learners' multiple choices item

Names	Text 1	Text 2	Text 3	Text 4	Text 5
Dom	1	2	1	2	3
Sal	2	2	3	5	5
Olive	5	5	5	5	4
Alia	5	5	5	5	5

Participant 1, Dom, was not able to get the required minimal three correct answers for the first four texts. However, he managed to get three correct items for the fifth text. When asked about his performance, he commented that he was not able to understand the questions given due to unfamiliarity with some words. Meanwhile, participant 2, Sal, only had two items correct for text 1 and 2, three items correct for text 3, and she managed to get five items correct for text 4 and 5. Based on her interview, she did not manage to get the multiple choices correct because she was still not familiar with the usage of I-Think Maps during the reading lesson. Olive, the third participant, managed to get all the items correct for text 1 to 4 except for text 5. Olive mentioned that she could not understand the question. The final participant, Alia, managed to get all the items correct for all five texts. Alia mentioned that I-Think maps helped her to learn more vocabulary items and understand the flow of story better using the flow map.

Based on the observation from the flow maps, Dom, the pupil with the lowest proficiency among the learners, was not able to number the sequence for Text 1 correctly. Dom mentioned that he did not understand the sentences. Due to his limited English vocabulary, he could not sequence the story. However, it did not impede his understanding of the story because when learners were asked to draw the sequences of the story in the flow map, Dom managed to draw the correct sequence for text 2 to 5. This suggests that Dom understood the story but due to lack of vocabulary, he was not able to answer the multiple choices correctly.

Sal was not able to number the correct sequence of the story for text 1. However, when the instruction for text 2 to 5 asked learners to draw or write down short sentences on the sequence of story in the flow map, Sal was able to sequence the story correctly for text 2, 3, 4. As for text 5, Sal was could only complete half the flow maps. The reason she gave when asked about the incomplete maps was that she was pressed for time. As for Olive and Alia, they managed to sequence the sentences for text 1. They were also able to draw the storyline in the flow maps for all the texts.

The second question aimed to investigate how the pupils perceive the use of I-Think Maps during the reading lesson. From the interview, the participants showed positive attitudes and perceptions towards the use of I-Think Maps in the classroom. Dom mentioned that he thought it was more interesting when I-Think Maps was used in reading because it helped him to recall the stories. He was also happy because he could draw the story instead of writing sentences when using the flow map. Sal, on the other hand, mentioned that she acquired new vocabulary when I-Think Maps was used. Alia and Olive also commented the

same thing about learning new vocabulary using Bubble Map as Sal. Sal, Olive and Alia agreed that the flow map had helped them in recalling the story. Like Dom, Sal and Alia also liked it when they could draw the story. Alia added that she liked it when she could write down the sentences and draw. Olive liked writing down the sentences in flow map because it saved time.

Besides vocabulary learning from using I-Think Maps, Alia and Olive commented on the use of double-bubble map during the lesson. Both showed interest when double-bubble map was used to compare the characters in the text. Using the map pushed both to analyse the characteristics of characters in the story. It challenged them to think critically, using words that were suitable to describe characters.

All participants mentioned they liked the brainstorming activity using circle map which served as a good collaborative learning activity. The participants worked with other peers to write down as many vocabulary items as they could generate from the reading text. Dom liked the group activity because he could get help from his friends when he was unfamiliar with a word while Alia liked helping her friends since she had the best English proficiency as compared to the rest.

The overall results from the interview suggested that the learners have had positive reactions towards the integration of I-Think Maps during reading lesson. When asked whether they would use I-Think maps during reading in the future, Dom and Alia agreed that they would use it always but Sal and Olive commented that they would use it sparingly.

Discussion
The purpose of this study was to explore how the integration of I-Think during reading lesson would improve learners' reading comprehension. Based on the findings discussed earlier, the integration of I-Think maps appeared to be effective in helping learners with their reading comprehension. This concurs with the previous studies on Thinking maps or graphic organizers by Phantharakphong and Pothitha (2013), Woodford (2015), Puteri, Faridah and Zuraida (2017).

Similar to the previous studies conducted by Novak (2006), Gill (2007), Smith (2010), Dias (2011) and Hashemain *et al.,* (2014), I-Think Maps was found to help learners in organising and recalling the main ideas in the story. When utilising drawing in I-Think maps to organise their ideas, it allowed readers like Dom who has lower proficiency in English to improve their reading comprehension. This concurs with the theory of dual-coding by Paivio (1971).

The learners also seemed to gain wider vocabulary when the I-Think maps were used. This resonates with the research done by Woodford (2015) who found that Thinking Maps is helpful in gaining vocabulary knowledge. Using I-Think Maps also seemed to train pupils to think critically. Even though only two of the learners mentioned it in the interview, it still corresponds with Ainon and Intan (2016)'s findings that thinking maps had positive impact on learners' thinking skills. Another finding which was unexpected was the mention of collaborative opportunities during the learning process. I-Think Maps seemed to also give learners opportunities to collaborate with their friends during the ongoing learning process.

Conclusion
In conclusion, even though the learners' improvement in reading comprehension was not very significant, the intervention provided them ample time for practice. Training the learners

on using the I-Think Maps might yield greater results. Thus, future research may consider conducting longer intervention to see more impact of the use of I-Think Maps on pupils' reading comprehension. The learners were also noted to show positive perceptions towards the use of I-Think Maps in the classroom especially when learning vocabulary. The activity also seemed to help promote collaborative learning among the learners. The present study hopes to encourage teachers to diversify their teaching strategies in helping to develop learners' reading skills as well as thinking skills. Future studies may also investigate how I-Think maps can be integrated with technology in helping pupils' reading comprehension.

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