The Effectiveness of using Infographics as an Aid for Reading Comprehension

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Abstract

The Malaysian education system highly regards the English language that the language is being taught in both primary and secondary schools for 11 years long. However, the Malaysian pupils seem to have not acquired the reading skills good enough. Therefore, the pupils need to have a support system that would enable them to make a better connection with their reading materials especially English reading materials and to lessen the cognitive load that they experience during their reading session. The purpose of this action research is to determine the effectiveness of using infographics to enhance reading comprehension among primary school pupils with average and weak English language proficiency. Sixteen Year 5 pupils from a semi-urban primary school at Pahang, Malaysia were chosen as its research participants. This study was inspired by the theory of Multimedia Learning by Richard E. Meyer. The data of this research was collected through tests; before the intervention and after the intervention. The data were collected from the test and were analyzed. The finding of this research shows that there is a significant improvement in the mean score from the pre-test to the post-test. The pupils were able to comprehend the text better through the intervention.

Keywords: Infographics; Multimedia Learning; Reading Comprehension; ESL Learner

INTRODUCTION

Malaysia is a country where its citizens consist of people from various races. To unite the people of Malaysia together, Bahasa Malaysia is used as the national language and the English language is regarded as the second language. Though much importance was given to the proficiency English language in the Malaysian education system, language usage and proficiency have been drastically declining among the pupils of primary and secondary schools, tertiary education and the academic community as claimed by Viswanathan (2019). The Malaysian students still could have a reasonable grasp on the English language though they have been learning the English language for around 11 years in both their primary and secondary school. Though the Malaysian education system has given great importance to the English language (Muhammad, 2015), the English language literacy among the Malaysian pupils has not achieved the expected and desired impact (Hazita, 2019). To further add salt to the wound, the emergence of the Fourth Industrial Revolution is worrying as the English language proficiency is highly regarded in preparing for the Fourth Industrial Revolution. English language as the medium of the digital world (Hariharasudhan...
& Kot, 2018) has a firm stand in being the bridge in achieving success in facing the Fourth Industrial Revolution. As the Fourth Industrial Revolution is expected to reform the way of living, trades, markets and the global economy, without the appropriate amount of English language proficiency, it is going to be a tough road for the pupils, who are going to face it during the career phase of their life especially during the Fourth Industrial Revolution is at its peak.

One of the most important skills in learning and acquiring the English language is reading. Gu (2003) has indicated that there was not much progress has been made. The Malaysian Ministry of Education has been encouraging the responsible stakeholders to improve the students’ English language skills especially their reading comprehension (Muhammad et. al., 2015). Reading comprehension among the Malaysian pupils especially the pupils from the semi-urban and rural areas is considered a big issue that years to be solved by their teachers in many years. According to Phantharakhong and Pothitha (2014), pupils find it difficult to understand the text that has been given to them to read and this has resulted in them could not relate themselves to the text and thus they could not identify the meaning of the text. Pupils could not understand the text that their teacher assigns them to read and a strategy should be devised to ensure that the pupils are captivated towards reading and most importantly the pupils could understand the meaning of the text that they are reading.

Melor and Nur (2011) have claimed that motivation is a key role in language learning and it is one of the sources that make the pupils initiate learning by themselves. The infusion of technology in language learning has been a trendsetter in the coming years and it has been evident that technology has given an amazingly positive effect to the learners especially (Bani-Hamad & Abdullah, 2019). Through the inclusion of technology in learning, pupils are to gain motivation and confidence to learn the input that is being taught to them.

The benefit of technology could be a great solution for the issue of reading comprehension that is being faced by the pupils especially the pupils in the semi-urban and rural areas. Strategies could be innovated through the benefit of technology in solving this issue. This has led to the idea of infusing the cognitive theory of multimedia learning by Meyer and Alexander (2010) which suggests that pupils make mental representations from the words and pictures that have been presented to them. This highly relates to the Dual Coding Theory which suggests that human cognition is so unique that it could deal with visual and verbal materials that are presented to it concurrently (Sadoski & Paivio 2004). Therefore, the purpose of this study is to investigate the effectiveness of the use of infographics which incorporates both words and image in one platform could help pupils on comprehending a text. The objective of this research is to determine the effectiveness of the use of infographics in helping pupils in comprehending the text that they have been assigned to read. On top of that, the research question that guides this research is how effective the use of infographics is helping pupils to comprehend the text they have read.

LITERATURE REVIEW

This subsection will be discussing the literature that supports this research. Besides that, this subsection will be described on the important terminologies used in this research and the aspects that have motivated into conducting this study, which is to explore the idea of using infographics to aid the pupils in comprehending their reading text.

READING

There are many definitions of reading that have been provided by many scholars who are experts in the field of reading skills. According to Nagy and Anderson (1984), reading can be defined as a process in which information from the text and the reader’s existing knowledge would merge which would enable the reader to produce their meaning out of the text. In other words, reading could be a successful task when the reader could effortlessly combine both the information from the text and the information that
he already knows. Another definition that has been provided by Grabe (1991 as in Alyousef, 2005) is that reading can be described as the interactive mechanism between the reader and the text itself to enable the reader to achieve reading fluency. After all, the main purpose of reading is to get the message from the text as what the writer intended for the readers to get (Pourhosein & Sabouri 2016). In this research, the aim of that the researcher has intended is the pupils to achieve reading fluency and then to enable her pupils to understand and make meaning out of the reading text.

**Reading Comprehension**

Phantharakphong & Pothitha (2014) has defined reading comprehension as the ability for a reader to comprehend the information that has been presented to them in written form. To look at a more profound definition of reading comprehension, Kendeou et al. (2009) have defined reading comprehension as the ability to interconnect a variety of skills and activities intelligibly that would lead to the interpretation of the information in the text. Relating to this research, this is the result that the researcher intends to gain from this research where the pupils should be able to relate the events that occur in the text and to summarise the situations into infographics. In other words, this research’s main objective is to explore whether the use of infographics would enable the pupils to comprehend their reading text or not.

**Multimodality**

The aspect of multimodality is one of the main aspects of this research. Kress (2009) has defined multimodality as a theory that observes how people communicate and interact with each other through a variety of modes such as writing, speaking, gesture, gaze, and visual forms. The advancement of communication nowadays has enabled humans to use multiple modes of communication. This has motivated the researcher to use the theory of multimodality in this research which she believes that the combinations of various modes of communication may aid the pupils to make meaning out of the text (Kress, 2010 as in Flewitt, 2019). To support the researcher’s idea and thoughts on this research to use multimodality as one of the key factors, Shams and Seitz (2008) have pointed out that multimodal learning is beneficial than the unimodal learning. These have guided the researcher to a clearer path to conduct this intervention which will be integrating both words and images in this research.

**Multiple Intelligences**

This research also puts much emphasis on multiple intelligences of the pupils. Gardner (2006) describes that humans have a unique way of interacting with the world. It can be deduced that every individual does have their ways of viewing the world and how they are interacting with it. As the differences may exist among each of our pupils in the classroom, the instruction in the classroom should be tailored according to that differences (Tomlinson, 2001). Therefore, based on this, this research has put so much consideration of intervening would cater to the pupils’ multiple intelligences the research participants are visual learners. They are identified to be visual learners where the pupils prone to learn based on illustrations and remember better when visual cues are used.

**The Cognitive Theory of Multimedia Learning**

The Cognitive theory Multimedia Learning is one of the prime aspects of this research that is meant to be explored. One of the greatest proponents of Multimedia Learning theory, Meyer and Moreno (2002) has described multimedia learning happens when a learner can make mental representations from the words and pictures that have been presented to them. Richard E. Meyer’s cognitive theory of multimedia learning can be related to the Dual Coding theory which suggests that human cognition is unique that it
could deal with both visual and verbal materials concurrently (Paivio, 2008). This theory has an assumption that there are two different cognitive systems which are one specialized for the representing and the processing of imagery (non-verbal objects) and another one aspect deals with language (Clark & Paivio 1991). Both the systems could work together at the same time in human cognition. This has been the foundation of this research where the idea of the use of infographics popped out as it combines both words and pictures in one platform or template. The subject of multimedia learning theory is an important element in this research as this research aims to enable the pupils to make mental representations through the reading materials that are provided to them in the forms of words and pictures.

**INTERVENTION**

In this research, the researcher has come out with a strategy to integrate infographics in helping the pupils to improve their reading comprehension of a text. During the intervention lesson, pupils will be coming out with infographics using text to summarise the important events that took place in the text and some pictures that are relevant to the text that they have read. The end product of the infographics that have been made by the pupils will enable the teachers to assess their understanding of the text that the pupils have read and the pupils will be able to summarise the text that they read into simpler words and pictures.

**METHODOLOGY**

**RESEARCH DESIGN**

This study engages action research as the basis of this research. It focuses on quantitative research. This research uses Kemmis and McTaggart’s research design (Kemmis & McTaggart 2005). This model of action research has proposed four stages in carrying out the action research that is the planning stage, action stage, observing stage and the reflection stage.

**Planning stage**

The reading comprehension texts were designed according to the pupils’ levels and the objective of the study. The intervention for the research issue as well as the pre-test and post-test questions for both the traditional and intervention method were prepared in advance to ease the research.

**Action stage**

Research participants were briefed on the objective of the research what is expected to be gained from the study. During the traditional method, the research participants are to read the text and answer the reading comprehension question. During the intervention method, pupils are to read the text, summarize their reading into an infographic and then answer reading comprehension text based on their understanding.

**Observing stage**

The significance of the intervention was observed through the margin of difference between the scores that have been obtained by the participants in both the pre-test and post-test.
Reflection Stage

Results of the pre-test and post-test were used as the spotlight in the reflecting process. Data that was collected in both the traditional method and intervention method will be used to ascertain whether the intervention that was suggested is effective in enhancing pupils’ reading comprehension.

Research Participants

The research was carried out in a semi-urban school at Kuantan District, Pahang. Sixteen pupils were selected through a purposive sampling method based on their English language proficiency especially their proficiency level in reading. All the research participants are either average or weak in their English language proficiency.

Instruments

This research consists of both pre-test and post-test. Both tests were conducted to measure pupils’ ability in comprehending a text that they have read. These tests were taken by the research participants right after their reading session during the traditional and intervention lessons.

Procedures

The pre-test was carried out to determine the research participants’ ability in reading comprehension without the intervention of infographics. The pre-test consists of 5 questions based on the Momotaro: The Peach boy passage. The participants were to complete the comprehension questions in about 15 to 20 minutes after the presentation stage in the lesson. The pre-test paper was collected after the participants have completed the test.

The intervention lesson was carried out the next day using the Kintaro: The Folkhero and The Golden Boy passage. It was carried out during the while-lesson where the participants will be creating an infographic based on the story that they have been provided during the pre-lesson. The infographics are made as a tool for the pupils to further consolidate their understanding of the passage that they have read. The infographics were used to summarize the passage and to make visuals connections on the passage that the participants have read. The participants will be recalling the passage that they have been given and create the infographics using their own words and visuals or images that are related or relevant to the passage. Then, they were provided with the post-test questions, similar to the pre-test that have been conducted the day before. The test paper was then collected after they have completed the test.

Data Analysis

Quantitative data analysis is used to analyze the data that were gained from the instruments, which is the pre-test and the post-test. Data that was collected from the pre-test and the post-test were analyzed using the IBM SPSS software to compare the mean scores from the pre-test and the post-test. Besides that, a paired sample t-test has been conducted using the IBM SPSS software.

Results and Findings

As the pre-test and post-test marks were carried out to determine the effectiveness of using infographics as an aid for reading comprehension, a comparison of the marks obtained by the pupils during the pre-test and post-test were recorded and tabulated in a table. Table 1 shows the marks obtained by the pupils during the pre-test, post-test and the margin of differences obtained on these tests.
Table 1: Result of Pre-Test, Post-Test scores

<table>
<thead>
<tr>
<th>PARTICIPANTS</th>
<th>PRE-TEST</th>
<th>POST-TEST</th>
<th>MARGIN OF DIFFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>C</td>
<td>10</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>D</td>
<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>E</td>
<td>10</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>F</td>
<td>8</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>G</td>
<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>H</td>
<td>6</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>I</td>
<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>J</td>
<td>6</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>K</td>
<td>0</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>L</td>
<td>2</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>M</td>
<td>8</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>N</td>
<td>6</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>O</td>
<td>6</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>P</td>
<td>0</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Overall Mean Score</td>
<td>4.4</td>
<td>9.6</td>
<td>5.2</td>
</tr>
</tbody>
</table>

Table 1 shows the progress that has been made by the pupils before the intervention were introduced to them which is during the pre-test and also after the intervention was introduced to them during the post-test. Based on the pre-test results that have been tabulated, the pupils’ performance was at intermediate and weak level mostly as the mean score obtained via the pre-test scores was 4.375. However, after the intervention of using infographics as an aid for reading comprehension that has been reflected through the scores obtained by the pupils in the post-test scores shows that there is a significant improvement as the mean scores that were obtained through the post-test scores were 9.6. This has shown that there is a significant impact through the intervention of using infographics as an aid to improve pupils to comprehend the text that was given to them and to grasp the meaning of the text better. This is because, through the intervention of infographics, pupils were able to answer the comprehension question better.

Table 2: Paired Samples Test

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Std. Error Mean</td>
<td>Lower</td>
</tr>
<tr>
<td>Pretest</td>
<td>Posttest</td>
<td>4.38</td>
<td>5.0274</td>
</tr>
</tbody>
</table>

To gain a stronger validity towards this research, a paired sample t-test was taken based on the scores obtained by the pupils during the pre-test and the post-test. Table 2 shows the results from the paired samples t-test. The result (t=6.23, p=0.00) strongly proves that the use of infographics as an aid for reading comprehension was effective. These results have confirmed that the infographics could be a great aid for the pupils’ reading comprehension. Besides that, the results that were obtained has answered the research question that was put forth where infographics are effective in helping to improve pupils’ reading comprehension. Therefore, the use of infographics does help to enhance reading comprehension of the pupils with a weak and intermediate level of English language proficiency.

These results that have been obtained through this research have also proved many aspects that could be related to the literature review of this research. Firstly, the pupils who were the research participants of this research has proved that they were able to comprehend the text that they are reading through the intervention of this research, that is, using infographics to help them to understand the text that has been provided to them. Through creating or building up their infographics, based on their reading it is proven that they can comprehend the information which has been highlighted by Phantharakphong.
& Pothitha (2014). And this leads to the understanding of the researcher that the pupils can make better meaning out of the text that they are reading through the help of infographics. Through this, the researcher’s intention to make the pupils relate the events that occur in the text and their pupils’ ability to summarise the events into infographics were fulfilled.

Besides that, the aspect of multimodality was also put forward towards this research. Through the results that have been obtained, the research is now convinced that the combination of various modes of communication has helped the pupils to make meaning out of the text as suggested by Kress (2009). The researcher has also learned that multimodal learning is effective compared to unimodal learning (Shams & Seitz, 2008) as the results gained from this research have proved that through the integration of both words and images were effective in aiding the pupils to comprehend their reading text better.

The emphasis that was made into highly considering pupils’ multiple intelligences before creating an intervention to improve pupils’ reading comprehension has shown a positive impact on the success of the intervention by the researcher. The intervention that was tailored to the pupils’ differences (Tomlinson, 2001) through the incorporation of visual cues in infographics has made the results obtained were positive. Considering the pupils’ intelligence where in this case the pupils are visual learners intervened a success and could be made as one of the strategies that have shown a great impact towards their learning especially in reading English language text and materials.

Most importantly, the results that have been obtained have shown that the pupils have proven to be able to make mental representation through the words and pictures that were presented to them in the form of reading text. This has proved the Cognitive Theory of Multimedia Learning by Meyer and Moreno (2002). This subject has been one of the most important elements that the researchers wanted to test on as this research aims to determine how effective the pupils would be able to make mental representations through the reading materials in the form of words and pictures. Besides that, the positive result that has been obtained through this research has proven the Dual Coding theory where the pupils’ cognition does deals with both visual and verbal materials concurrently. This could be evident when the pupils could create infographics by combining both words and visuals in one template and gains a better understanding of the text through the infographics that they have created. Through this research, it is proven that pupils could create infographics through the reading material that they had obtained and from this, it could be deduced that the pupils were able to create the infographics in their own words and also by putting on the relevant pictures that are related to their reading text.

Many other findings could support the findings obtained in this research. The finding that has been obtained in this study is mirrored by many past studies that are related that has been made previously. Many past studies have shown a positive result towards the idea of using infographics in teaching and learning especially in the English Language learning field. One of the studies was the study on ‘The Impact of Infographics on Iranian EFL Learners’ Grammar Learning’ by Rezaei and Sayadian (2015). The participants consist of 60 Iranian EFL learners. The instruments used in this study were an achievement test which was designed as a pre-test and post-test, similar to this study. The results of the study showed that the use of infographics has significantly improved the grammar knowledge of the participants and has increased the motivation among them to enhance their knowledge in grammar. The findings made by Rezaei and Sayadian (2015) could be a good reflection for this study as both the results obtained show a positive response and both have enhanced pupils’ motivation to increase their competency in their English language skills.

The finding in this study could be also mirrored by the study made by McEntee (2019) where he has conducted a pilot study on how the use of infographics during various stages on an English discussion task would make the students interpret and discuss information meaningfully in each stage. The results of the study have shown that using infographics, the students find it easier to understand the textbook well and the students also find the use of infographics to be interesting and fun. Relating to this study, the use of infographics has proven effective in tackling various problems encountered by the pupils in
learning and mastering the skills of the English language. As in this research, the pupils find it easier and better to understand the reading text through the task of creating their infographics based on the reading text that they are reading.

Another study that is closely related to this study was the study on the ‘Infographic Posters for Enhancing 21st Century Communication Skills’ by DeWitt and Norlidah (2017). This study aims to explore the effectiveness of making reading assignments as an infographic and presenting it to the rest of the class. This study consists of four undergraduates who have shown that the students have developed the communications skills of the 21st century as well as literacy skills for summarizing main points of the articles or reading text that has been assigned to them. The focus of the study that could be related to this research is the ability of the students to summarise the main points form the articles that they have read. These have motivated the researcher to further use the same idea to conduct this study to her pupils from semi-urban areas back in her school.

CONCLUSION AND IMPLICATION

CONCLUSION

Based on the findings that have been gathered, it can be inferred that the use of infographics does help the pupils to understand a text significantly. The participants get to comprehend the meaning of the text using infographics where the text will be summarized meaningfully using simpler, comprehensible words and also pictures that are related to the infographics. The participants get to experience fun and motivated to comprehend the text where they could understand the text through simpler and interesting media, which is the infographics. These findings will be extremely useful for the teachers, especially the ESL teachers to help their pupils in their classroom to comprehend a text that the teacher is using in the classroom. The findings have shown a noteworthy increase in the pupils’ comprehension by their notable achievement in answering the comprehension question during the post-test that has been conducted during this research. Besides that, the use of infographics is indeed a cost-efficient material to be used in the classroom as only a smart device that could be connected to the Internet is used to employ the wonders of infographics.

IMPLICATION

The findings of this research have shown that the use of infographics can be one of the ways for the pupils to learn the English language especially in improving their reading skills. The use of infographics has empowered the pupils to comprehend that text that is given to them during the lessons in the classrooms. Besides that, the use of infographics has, of course, captivated their interest and attention to further use this strategy to understand the reading text that has been provided to them. Thus, teachers could use infographics to capture their pupils’ attention and interest in learning the language especially developing their excitement in reading English materials.

Reference:


