

Effects of Mind Mapping and Pre-Questioning on Reading Comprehension

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ABSTRACT

This study was conducted to investigate the effects of mind mapping and pre-questioning on the students' reading comprehension and on the students' reading comprehension levels: literal comprehension, inferential comprehension, evaluation, and appreciation. This study was a quasi-experimental design, which involved 30 Diploma Nursing Student Stikes RS Baptis Kediri. Mind mapping was used for the experimental group and pre-questioning was for the control group. The instrument was 25 item reading comprehension test incorporating the four reading comprehension levels based on Barrett taxonomy. Independent Sample t-test and Manova test were used to analyze the data, which results revealed that there was no significant difference between the students who received mind mapping and those who received pre-questioning in their overall reading comprehension and in their literal comprehension, evaluation, and appreciation level. However, there was a significant difference between the students who received mind mapping and those who received pre-questioning in their inferential comprehension.

Keyword: *reading comprehension; mind mapping; pre-questioning; literal comprehension*

INTRODUCTION (Calibri 12 bold uppercase)

Background knowledge or schemata plays an important role in reading comprehension. Clarke and Silberstein (as cited in Carrell and Eisterhold, 1983, p. 556) said that "a reader's comprehension depends on her or his ability to relate the information that she or he gets from the text with prior knowledge." Therefore, if the students do not have related schemata, meaning that she or he does not have an understanding of the incoming data from the text, then she or he will find difficulties to understand a text and must do something to get a level of comprehension (Celce-Murcia, 1991).

Generally, every reader has already had his or her prior knowledge or background knowledge, yet it requires to be activated when he or she is reading. Activating prior knowledge before reading can help the students get ready to read and be open to new information (Al Faki & Siddiek, 2013). "In spite of the crucial role of schema activation, it is often forgotten or ignored in discussion of reading texts (Yin, as cited in Al Faki & Siddiek, 2013, p. 44)." Therefore, here is probably the importance of the teacher's role in helping the students activate their schema before reading. Activating prior knowledge refers to the activities or strategies which are used to bring out what students already know

about a topic. The most appropriate time to activate or build the students' schemata is in pre-reading activity.

Schema is often defined as a concept in the brain which stores everything a person has already known in the past and relates it to the new experience he or she has. Stevens (as cited in Al Faki and Siddiek, 2013) defines schema quite simply as what one already knows about a subject.

Many linguists, cognitive psychologists, and psycholinguists admit that schema has an important role on reading process. They argued that schema is one of key factors affecting comprehension process. In line with this, Ajideh (2006, p. 4) mentions schema theory acknowledges that whenever people gain knowledge, they try to fit that knowledge into some structures in memory that can help them make sense of that knowledge. It means that the students' prior knowledge or schema directly affects their comprehension ability.

Xiao-hui, Jun, and Wei-hua (2007) mention that there are three types of schemata. First is linguistic schemata, which deals with reader's existing language proficiency in vocabulary, grammar, and idioms schemata; second is formal schemata, which concern the organizational forms and rhetorical structures of written texts; and third is content schemata, which is related to the background knowledge of the content area of a text or the topic a text.

Both background knowledge of the topic and vocabulary mastery are needed to get a better reading comprehension. McNamara et al. (as cited in Rizqiya, 2003) stated that in order to be able to comprehend text, not only the knowledge of the world is required but also the knowledge of the language. Language of the world here means the content schemata while knowledge of language means the formal schemata. However, schema requires to be activated when a reader is reading. Activating prior knowledge before reading can help the students get ready to read and be open to new information (Al Faki & Siddiek, 2013). Schema activation is often forgotten or ignored by the teachers when they teach reading (Yin, as cited in Al Faki & Siddiek, 2013). Thus, the importance of the teacher's role in helping the students activate their schema before reading is emphasized. The most appropriate time to activate or build the students' schemata is in pre-reading activity.

Beside schema activation, the appropriate and interesting teaching method or technique were also necessary. Chiramanee (as cited in Thongyon & Chiramanee, 2011) indicated that inappropriate teaching method and outdated teaching technique could cause many students failed understanding the content of the reading materials. In line with Chiramanee, Fitrawati (2009) also states that many teachers used outdated teaching technique when they taught reading class. She mentions that the teacher usually started the learning process by asking the students to read the text by themselves, discussing some difficult words and doing the reading comprehension questions. Those teaching reading activities are unattractive. The students will be inactive because the teacher did not provide any activities which could motivate and make them interested in reading the text going to be discussed.

Concerning teaching technique, Siriphanich and Laohawiriyanon (2010) suggest the use of mind mapping, which they define as an instrument to represent students' understanding by using words, picture with color and symbols in a hierarchical or tree branch format. Mind mapping is intended to give an opportunity for students to think of as many ideas as possible and to activate their schemata related to the topic. It can also train the students to recall what they already knew related to the topic before reading activity. Similarly, Buzan (as cited in Indrayani, 2014, p. 18) considers that mind mapping is a useful technique which can activate the whole brain or background knowledge.

Mind mapping could be conducted as a pre-reading activity. Pre-reading activity is an activity which is done before reading process and aims to motivate, prepare, and activate the students' background knowledge before reading. Mukhroji (2011) defines pre-reading activities as an activity, which is directed at reader's prior knowledge, especially of building and activating reader's schemata before reading. The goals of pre-reading stage are to activate the students' knowledge of the subject, to provide any language preparation that might be needed for coping with the passage, and finally to motivate the learners in order to want to read the text (Celce-Murcia, 1991). Meanwhile, Lindsay and Knight (2006, p. 76) states that pre-reading activities are expected to be able to assist the learners achieve the aims of the activity (i.e. stimulate what they already know about the topic, provide them with background information that they need before they read, and help them with words and phrases they will need to know).

The use of mind mapping in the pre-reading activity could also be combined with pre-questioning. Brown (as cited in Hodijah, 2012, p. 3) defines pre-questioning as some questions which are raised by teachers before the students read the whole text and aims to build the students' interest and motivation as well as their cognitive factors. Pre-questioning is very useful to activate the schemata, because the students are assisted to predict what will be faced by them in the reading text.

According to Harmer (as cited in Hodijah, 2012) there are four kinds of pre-questioning: (1) pre-questioning before reading to confirm expectations (to encourage the students predicting the content of the text, and to give them an interesting and motivating purpose for reading); (2) pre-questioning before reading to extract specific information (to force the students to extract specific information from the text); (3) pre-questioning before reading for general comprehension (to build up the students' prior knowledge); and (4) pre-questioning before reading for detailed comprehension (to give the students some detailed information that should be found by them in the whole of the text).

There are some advantages of pre-questioning on reading comprehension. First, it helps students in getting specific information from the text (Harmer, 1985). Second, it helps the students to relate every information they get from the text before making a conclusion. Hence, by answering pre-questioning from the teacher, the students can take the main point of the text. Third, it helps the students to predict what will be faced in reading text so they can find inference meaning from the text (Brown cited in Dewi, Sutarsyah and Hasan, 2013). Fourth, it enriches students' vocabulary because pre-questioning provided by the teacher involves many words list (Dewi, Sutarsyah & Hasan,

2013). Fifth, it helps students in improving their critical comprehension level because it involves some questions which build the students' imagination about their personal reacting (Dewi, Sutarsyah & Hasan, *ibid*). When schema is activated using relevant technique such as mind mapping and pre-questioning, it is expected that students' skill on reading comprehension could be enhanced. Generally, the aim of reading is to understand or comprehend what is being read. Howel at al. (as cited in Laila, 2009) said that reading comprehension is the process of integrating information from the text with the knowledge acquired previously in order to build meaning. According to Emilia (as cited in Andanty, 2006), reading comprehension is a matter of how deep a reader's understanding of the text is. It can be said that everyone has their own level of understanding in reading; their understanding comes from the text he or she reads and his or her own knowledge outside the text.

Ruddell (2007) classified the level of reading comprehension into four levels. First is literal comprehension, which involves understanding of information that is explicitly stated in the text. Second is inferential comprehension, which concerns drawing conclusions not stated in the text but implied by the facts given. Third is evaluation, which deals with judgments whether something is real or imaginary, whether it is appropriate, worthwhile, desirable or acceptable.

Beside the teaching reading technique, the teacher should also use appropriate steps of teaching reading. In teaching reading, there are three phases: pre-reading, whilst-reading, and post-reading activities (Avery & Graves, as cited in Medina, 2008). Pre-reading activities are intended to prepare the students before reading, to motivate them to read the text, and to activate or build their background knowledge or schema related to the topic going to be discussed. If the students do not have any related schemata, the teacher is responsible for helping them by providing background knowledge so that they are able to achieve better comprehension.

Considering the importance of background knowledge and teaching reading technique on reading comprehension, the researcher was interested in investigating the effect of mind mapping and pre-questioning on the students' reading comprehension and the students' reading comprehension levels. The framework used in investigating this comprehension level was Barrett Taxonomy, which consists of literal comprehension, inferential comprehension, evaluation, and appreciation (Ruddell, 2007). She implemented mind mapping and pre-questioning as pre-reading activities.

METHOD

The study under report was a quasi-experimental design or nonequivalent-groups pretest-posttest design as modeled by McMillan (2008). The researcher used this certain design by considering what Ary et al. (2010) state that conducting research in the school situation, the researcher cannot rearrange the class to accomplish his or her study. Non-random sampling was chosen to take the sample of this study because the researcher used the available classes provided by the headmaster. The experiment was conducted for five

meetings because the researcher had limited time to do it; the experiment was conducted three weeks before final examination. One teacher was assigned to teach both groups, which aimed to avoid the appearance of extraneous variable and the potential for experiment effects (McMillan, 2008). He then was involved in the administering of the pre-test, post-test, and the treatment.

The participants of this study were the 30 Diploma Nursing Student Stikes RS Baptis Kediri because the researcher assumed that mind mapping and pre-questioning would be more effective for the students who have low English proficiency. The researcher was given two classes to determine the experimental and the control groups.

By considering what Arikunto (1998, p. 120) said, the researcher decided to take the sample 30% of the population. It was more or less 56 students, but then the normal distribution of the pretest scores was not obtained. Therefore, the researcher decided to reduce the number of the sample by dropping four outliers and the exact sample was 52 students: 26 students from IPS1 and 26 students from IPS2.

The activities in teaching reading which were conducted in both groups consisted of three stages: pre-reading, whilst-reading, and post-reading activities. In the experimental group, before delivering pre-reading activity, the teacher merely told the students the title of the text going to be discussed. After that, the teacher asked the students to predict the ideas of the story in a pair using mind mapping. In their mind mapping, they wrote down the ideas for each component of the generic structures. Meanwhile, for those who were in the control group, the teacher provided some pre-reading questions which guided the students to predict the sequence of events in the story.

Next, in whilst-reading activities, the teacher distributed the text and asked them to read the story in the text in pair. One student in pair read the first half of the text and another student continued the second half. After that, they shared what they have read in pair. The teacher gave them guided reading comprehension questions incorporating the four reading comprehension levels (literal comprehension, inferential comprehension, evaluation, and appreciation). At last they did some reading comprehension questions independently. In post-reading activity, the students were asked to change the end of the story based on their imagination. This activity was chosen as a post-reading activity because the researcher was inspired by what Lindsay and Knight (2006) argued that other skills can be involved in teaching reading, such as writing skill.

The instrument of this study was a reading comprehension test incorporating the four levels of reading comprehension based on Barrett's Taxonomy. This was because the researcher would like to investigate the students' reading comprehension achievement with regards to reading comprehension levels. The test was adapted from standardized test; national examination test (Grace, Sudarwati, & Muryati, 2008) because it is more consistent and reliable as an assessment instrument. The test was an objective test. It was in the form of multiple choice questions with four options for each question. In total 25

items were prepared: 7 questions for literal comprehension level, 6 questions for inferential comprehension level, 6 questions for evaluation level, and 6 questions for appreciation level. The questions in the pre-test were the same as the post-test.

The steps of collecting data were first; the researcher constructed the pretest as the research instrument. She prepared a narrative text entitled "The Legend of the Mountain Tangkuban Perahu" and constructed 25 item reading comprehension test incorporating the four levels of reading comprehension based on Barrett Taxonomy. Second, she then prepared three lesson plans or guideline for the instructor or teacher. Third, for the treatment, she prepared three narrative texts entitled "The Legend of Bawang Merah and Bawang Putih"; "The Legend of Prambanan Temple"; and "The legend of Toba Lake" and constructed ten item reading comprehension tests for each title of those narrative texts. She then asked permission to the headmaster to conduct the experiment in his school; she got two classes of the first grade. Taking a lottery was chosen to determine which class to be the experimental group and the control group. Next, the researcher informed the teacher who taught in those two classes that he would be involved in the experiment and she gave lesson plans as the guidelines for conducting the experiment. Third, the instrument was tried out to another class which was considered having similar reading comprehension ability with the two chosen classes for the actual experiment. It aimed to know the reliability and validity of the instrument. After trying out the instrument three times, it had a high reliability because the coefficient was 0.858; it was close to 1.00 (Tuckman, 1978). The item discriminability of the instrument was ten questions categorized as "satisfactory" and fifteen questions categorized as "effective." Meanwhile, the item difficulty of it was fourteen questions categorized as "acceptable," five questions categorized as "easy," four questions categorized as "difficult" and two questions categorized as "very difficult." The researcher decided to use it as the instrument of the study because she had limited time. The content validity of the instrument was proved by the appropriateness between the test specification and the content of the instrument.

After trying out the instrument, pretest and posttest were administered in this study. However, before the posttest was conducted, the treatment was implemented for two weeks. In this present study, the researcher was only as a non-participant observer. Therefore, she involved the instructor or teacher in conducting the treatment for both the experimental and the control groups with different technique.

The researcher analyzed the obtained scores in order to confirm the hypotheses of this research. Before testing the first research question hypothesis, the researcher analyzed the pretest scores of both the experimental and the control group using Independent-Sample T-test after checking the normal distribution of the pretest scores. It aimed to know whether the students of both groups had the same reading comprehension ability. The calculation of the pretest scores revealed that the normal distribution was obtained after the researcher reduced the number of the sample by dropping four outliers. Next, the

researcher tested the first research question hypothesis. To confirm the hypothesis of the first research question, which concerned whether there was a significant difference between the students who received mind-mapping and those who received pre-questioning in their reading comprehension achievement, the researcher analyzed the data using Independent-Sample T-test. Meanwhile, to confirm the second, third, fourth and fifth research questions, the researcher analyzed the data using Manova test since there was more than one dependent variable in this study. However, before analyzing the second, third, fourth and fifth research questions, the researcher broke down the students' scores based on each level of reading comprehension (literal comprehension, inferential comprehension, evaluation, and appreciation). To fulfill the two requirements of Manova test, the researcher checked the normal distribution of the data and the homogeneity of variances before analyzing the data. The result revealed that the normal distribution was 0.42 and the homogeneity of variances was 0.01. It meant that the normal distribution of the data and the homogeneity of variances were obtained.

FINDING AND DISCUSSION

The overall results of the research on student perceptions of online English learning in the Nursing Program D3 of Stikes Bina Sehat PPNI Mojokerto were 35 students. categories or groups according to available levels which include 5 categories, namely: very positive, positive, moderate, negative and very negative. Based on the results of the questionnaire, students have positive and negative opinions about online learning that is carried out. Some study participants prefer face-to-face or offline learning to online learning. Study participants reported that online study time was very limited. Interaction with teachers and students is also very limited. They claim that face-to-face learning helps them better understand the material explained by the teacher, and that they can learn and work collaboratively more optimally. Thus, all study participants liked and tended to feel more comfortable either face-to-face or offline learning. This is supported by (Ardiyanto, Mulyadin, Santi, & Dharma, 2021) which explains that a student in a class is generally more enthusiastic if they have active collaborators. On the other hand, the results of another study showed that about 2,000 study participants prefer to study online. this is because they have the ability to browse the subject matter using internet sources. This can help them understand and explore the material to the fullest. Research participants also revealed that they have positive perceptions when teachers use certain platforms or applications, such as Google Classroom, Edmodo, YouTube, Google Meet, SPADA, and others.

Based on the results of the study, the research participants explained that not all teachers explained the material clearly, so that students did not understand the material

given. This is because the teacher only provides material in Google Class without detailed explanations or instructions. Research participants think that if teachers use Zoom or Google Meet to explain the material, it will encourage them to understand the learning material. Direct interaction also encourages them to ask questions about relevant material. This is supported by the opinion (Cakrawati, 2017) who asserts that the use of platforms or applications can be utilized optimally by teachers to establish good interactions with their students in the online learning process classroom.

This e-learning activity is certainly a challenge for students. Students must be able to adapt to situations and conditions in e-learning mode. Therefore, all study participants believe that teachers should provide simpler instructions in online learning activities. This simplification of instruction is necessary for students to slowly build an understanding of the subject. In addition, research participants suggested that in addition to simplifying instruction, teachers should be more active in interacting and providing feedback on assigned tasks. Another challenge faced by research participants is the emergence of feeling bored and bored with the e-learning process that has been carried out so far. So that research participants hope that teachers will have more innovations and interesting learning variations such as vocabulary quiz, games, and assignment.

This is in accordance with (Molina-Carmona, Pertegal-Felices, Jimeno-Morenilla, & Mora-Mora, 2018) who asserts that learning activities can cause boredom and discomfort if the teacher is not good at communicating and establishing lively interactions with students. Students should be involved as the subject of the activity rather than the subject of the activity. A good situation, environment and interaction with teachers and other students can encourage the creation of an optimal learning process.

CONCLUSION

This present study was conducted based on the fact that most of the teachers ignored the importance of providing the interesting technique in teaching Reading course. In fact, comprehending the content of the text is a consequence of having interest in reading. Focusing on the pre-reading stage, the researcher intended to investigate the effect of mind mapping and pre-questioning on the students' reading comprehension achievement generally and specifically analyzed the effect of mind mapping and pre-questioning on the students' reading comprehension levels.

The equivalence of the students' reading comprehension ability before the treatment was implemented firstly checked. The researcher used Independent Sample T-test to examine it. The result revealed that the students of both the experimental group and the control group had the same reading comprehension ability before the treatment was implemented. In the experimental group, the students were given mind mapping as the

treatment, while in the control group the students were given pre-questioning as the treatment.

After the treatment was implemented, there was no a significant difference between the students who received mind mapping and those who received pre-questioning in their reading comprehension achievement. However, both mind mapping and pre-questioning could be used as an alternative technique to improve the students' reading comprehension achievement because there was a slight improvement on the mean scores of both groups' pretest and posttest.

The mean score of the control group was better than the mean score of the experimental group. It happened because of some possible factors. First, the students' reading comprehension ability in the control group was 2.77 higher than those in the experimental group prior to the treatment. Second, the students in the experimental group were probably less familiar with the story of "The Legend of Tangkuban Perahu." Third, it might be related to the students' lack of vocabulary

mastery. Based on the information from the teacher who was involved in this study, the students in the control group had English proficiency or vocabulary mastery better than those in the experimental group.

The Manova test was used to know the effect of mind mapping and pre-questioning on the students' reading comprehension levels. The calculation revealed that there was no a significant difference between the students who received mind mapping and those who received pre-questioning in their literal comprehension, evaluation, and appreciation level. However, there was a significant difference between the students who received mind mapping and those who received pre-questioning in their inferential comprehension level.

Concluding the result of this study, the researcher finally could give some suggestion and recommendation. The researcher would like to present not only suggestion for students and teachers but also recommendation for further study.

For the students, the researcher would like to suggest that they activate their background knowledge related to the topic being discussed. To get a better reading comprehension, the students should improve not only their ability in mastering vocabulary but also their ability in activating background knowledge related to the topic being discussed.

For the teacher, the researcher would like to suggest her or him to consider the importance of providing an interesting technique which can motivate and attract the students' interest in reading because comprehending the content of the text is a consequence of having interest in reading the text. Mind mapping and pre-questioning can be used as an alternative technique to activate the students' background knowledge of

the topic being discussed and help the students comprehend the text they read. However, the teacher should also teach about word recognition or vocabulary.

For future researchers, first the researcher would like to recommend them to replicate this study with bigger sample of students so that they can probably have a better result of their study. Second, the researcher recommends them to implement the treatment as many as they can. They might have a better result so that their study can give a contribution to the students and the teachers as well.

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