IMPROVING STUDENTS' READING COMPREHENSION BY USING MIND MAPPING TECHNIQUE THROUGH *MIMIND* APPLICATION AS ANDROID BASED MOBILE LEARNING AT THE FIRST GRADE OF SMAN 1 SUMBEREJO IN ACADEMIC YEAR 2020/2021

(An Undergraduate Thesis)

By:

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BANDAR LAMPUNG

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ABSTRACT

IMPROVING STUDENTS' READING COMPREHENSION BY USING MIND MAPPING TECHNIQUE THROUGH *MIMIND* APPLICATION AS ANDROID BASED MOBILE LEARNING AT THE FIRST GRADE OF SMAN 1 SUMBEREJO IN ACADEMIC YEAR 2020/2021

By

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The objectives of this research are: (1) to find out the significant difference of using mind mapping through *miMind* Application in improving students' reading comprehension of narrative text; and (2) to know the students' responses toward *miMind* Application as android based mobile learning. This is a quantitative study which had intact group pre-test and post-test design. Therefore, the effectiveness of this study can be seen through the significant difference before and after the implementation of mind mapping technique through *miMind* Application as revealed on the students' scores. This research was conducted at the first year of SMAN 1 Sumberejo in academic year 2020/2021. The sample of this research was X MIPA 1 consisted of 36 students which was selected by using cluster random sampling. The research data were collected by using reading test and questionnaire.

The results show that students' mean scores in the pre-test was 61.18 and post-test was 76.81. It can be seen that the students' mean score of post-test increased about 15.63 point after being taught by using mind mapping technique through *miMind* Application. Then, to find out the effectiveness, the results were computately analyzed using Paired Samples T-Test through SPSS 20 Program, which showed that t-value (6.780) was higher than t-table (2.0301) at level of significance 0.05. Based on this result, H_0 or null hypothesis was rejected, while

H_1 or alternative hypothesis was accepted. In other words, there is significant difference between the students' reading comprehension in narrative text before and after the implementation of mind mapping technique through *miMind* application in SMAN 1 Sumberejo. It was also supported by the students' responses from the questionnaire. From the result, there were 89% students gave positive response and 11% gave negative response toward mind mapping through *miMind* Application. It can be concluded that mind mapping technique through *miMind* Application is effective to improve students' reading comprehension of narrative text.

Keywords: Reading Comprehension, Mind Mapping Technique, *miMind* Application, Android, Mobile Learning.

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in

The Language and Arts Education Department
of The Faculty of Teacher Training and Education

FACULTY OF TEACHER TRAINING AND EDUCATION
UNIVERSITY OF LAMPUNG
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2021

Research Title	:	**IMPROVING STUDENTS' READING COMPREHENSION BY USING MIND MAPPING TECHNIQUE THROUGH MIMIND APPLICATION AS ANDROID BASED MOBILE LEARNING AT THE FIRST GRADE OF SMAN 1 SUMBEREJO IN ACADEMIC YEAR 2020/2021**
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Menyatakan bahwa skripsi ini adalah karya saya sendiri. Sepanjang pengetahuan saya, karya ini tidak berisi materi yang ditulis orang lain, kecuali bagian-bagian tertentu yang saya ambil sebagai acuan. Apabila ternyata terbukti bahwa pernyataan ini tidak benar, sepenuhnya menjadi tanggung jawab saya.

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Yang membuat pernyataan,

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CURRICULUM VITAE

Dhea Novitasari was born on January 1st, 1999 in Semarang. She comes from loveable family with three children and she is the first child of a wonderful couple, Cahyo Adi Sudarsono and Sri Murniati. Her parents are entrepreneurs. She has one beloved brother named Yoga Dwi Kurniawan and one beloved sister named Resti Triyanata.

After attending Elementary School of SDN 1 Tegalbinangun in 2011, she continued her study at Junior High School of SMP N 2 Sumberejo in 2014. She pursued her study at SMA N 1 Sumberejo and graduated in 2017. Having graduated from senior high school, she continued her study to English Education Study Program, the Teacher Training and Education Faculty, Lampung University. In the same year, she joined UKM-U ESo Unila as a Public Relation Staff. From the organization, she participated in many speech competitions in national, provincial, and regional fields, such as in ALSA Indonesia University, EIA Lampung University, and EPA Polinela University. She got the second place, third place, and finalist on her competitions. In the same year, she also joined BEM-U KBM Unila as a Foreign Ministry Staff. From there, she studied by visiting another university outside Lampung University, for instance a visit to ITERA, Lampung. In 2019, she became a General Treasurer of Society of English Education Department (SEEDS) FKIP Unila. In 2020, she followed LDK Birohmah as a Staff of Research and Achievement Team.

In addition to the organizations, she also followed many activities, such as Selection of Outstanding Students and National Micro Teaching Competition. For the Selection of Outstanding Students, she became the Top 10 in 2018 and successfully got 2nd place for the Outstanding FKIP Students in 2019. While, for National Micro Teaching Competition, she was in position 16 out of more than 50 participants at the event in 2020. She accomplished her Social Appreciationship

Training (KKN) at Sukacari Village, East Lampung, from January to February 2020. Then, she conducted Teaching Practice Program (PLP) at SMP N 2 Sumberejo, Tanggamus, Lampung, from August to October 2020. In 2021, she had an opportunity to become an SDGs delegate representing Lampung Province on the national stage.

DEDICATION

This script is dedicated to my missed father, my beloved mother, my beloved grandmother, my dearest younger brother and sister, and all my support system. I also dedicate this script for Indonesian education.

MOTTO

"It may be that you hate something but it is very good for you, and it may be that you love something but it is very bad for you. Allah is Knowing, and you do not know."

(Al-Baqarah: 216)

"Know that victory is with patience, spaciousness is with narrowness, and difficulty is with ease."

(HR. Tirmidhi)

"Every step is on the path."

(Lao Tzu)

"You are what you do when you are alone."

(The Writer)

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In the name of Allah SWT., The Beneficent, The Merciful. All praises be to Allah for the blessing given to the writer, so she could eventually accomplish this script entitled *Improving Students' Reading Comprehension by Using Mind Mapping Technique through Mimind Application as Android Based Mobile Learning at The First Grade of SMAN 1 Sumberejo in Academic Year 2020/2021*. Peace and blessing be upon to the Prophet Muhammad SAW., who had guided mankind to the right path blessed by the Lord.

In this opportunity, the writer would like to remark the utmost thanks from her deep heart to the following people, who always helped, contributed, and empowered her to achieve a success in completing this script.

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1.1 Background of the Problem

Reading is the most crucial language skill because it is the base of knowledge (Birch, 2014) in Khalid et al. (2018:2). This skill has a vital meaning on humans; that is why it is the crucial reason for learning and proficiency. Reading is also a distinctive procedure which rounds through eyes, speech, and mind (Alshehri, 2014) in Khalid et al. (2018:2). It indicates that reading is an active process which involved many aspects. Moreover, the act of reading cannot be separated from comprehension (Indrayani, 2014). The students cannot get their reading achievement within comprehending what they read. In comprehending a text, students should be taught and monitored by teacher who well understood the way to teach reading comprehension properly. The main purpose of teaching the reading skill is to train the students so that they could attain ideas and information to comprehend a text.

According to Kemdikbud, as the ministry of the Government of Indonesia that responsible in the field of early childhood education, primary education, secondary education, public education, and management culture (Hidayatsrf, 2020), on High School Syllabus of Curriculum 2013 verse 2018 revision, the first grade of senior high school students are expected to learn some types of text, such as introduction, extended, showing care, intention, descriptive, announcement, recount, and narrative. Narrative is a common text which is used in teaching and learning activities and national examination (Septiyani, 2017). Furthermore, narrative text is a text which tells a story using a series of events (NSW Department of Education and Communities, 2011:3) in Septiyani (2017). In line with the purpose that is to entertain the readers, it can be assumed that narrative text can be interesting and easy to study.

However, many students find difficulties that often appear in comprehending a reading text, in this case is narrative text. Due to the fact, students have difficulty understanding stories that they read (Garcia et al., 2014). It indicates that the students can read aloud the text, but they do not understand and remember what the text talks about. Most of students read for many times to get some information they are looking for. In contrast, reading is a long process (Septiyani, 2017). While the time is limited, but they fail in getting the information, they prefer to answer quickly rather than comprehend the text deeply. Consequently, they will get unsatisfying achievement in reading comprehension. Furthermore, it is not about the students' problem, but also the teacher's. Aside from students, teachers may be the most reliable source of information concerning boredom in students during class instruction (Daschman, 2013). When teachers cannot package the material effectively, students who feel tired after full day class in high school will also get less interesting to learn something, especially to comprehend a text. Therefore, teachers should have teaching and learning techniques that can help students improve their achievement (Kusmaningrum, 2016). In addition, the usage of media is also important to support teaching and learning technique in getting better understanding. Considering that facts, it is needed for teacher to find an effective technique in teaching reading comprehension, so that the students will get the proper ideas and needed information from a text that they read. For this reason, mind mapping is one of the best answers that can help students in improving their reading comprehension of narrative text.

Mind mapping is an effective technique for students to get better understanding and remember the important lessons. Due to the fact, mind map enhanced and enriched through color, pictures, code, and dimension to add interest, beauty, and individuality (Liztyanputri, 2016). This is important to help the students in learning creatively and memorizing the recall information specifically. Some previous researchers used mind mapping technique to be applied in learning process. The first research was done by Rachma Patria (2015), entitled Increasing Students' Reading Comprehension through Mind Mapping Technique from Narrative Text. The result of mind mapping was effective to

increase the students' reading comprehension of narrative text. The second research was done by Rissa San Rizqiya (2013), entitled The Use of Mind Mapping in Teaching Reading Comprehension. The result of mind mapping was effective to be an alternative technique in teaching reading comprehension. The result of the students' tasks indicated that the students' reading comprehension increase after being taught by using mind mapping technique. However, these previous studies have not given in depth information to which of media of mind mapping in reading comprehension itself. It is most useful.

Referring the afore mentioned studies, it is reasonable to assume that students will probably avail themselves of mind mapping in terms of generating an organizing ideas for their reading comprehension of narrative text. Yet, it was also the researcher's assumption that, if it was manual mind mapping, it would be less effective since they would organize the ideas of the text by creating nodes and lines on their book by obvious stationary such as book, pen, ruler, even color tools. In addition, creating a mind map is a very personal process. It means that mind map between one student and another student will be different. It will lead the difficulty for students to start organize their mind map if there is no significant map reference to do that. Furthermore, the development of science and technology encourages various reform efforts in learning process (Wicahyani et al., 2018). Given the findings and deductions regarding the usage of media above, the researchers assumed that mind mapping through android application as digital media can be more effective than manual media.

M-learning (Mobile learning) is a kind of learning model allowing learners to obtain learning materials anytime and anywhere using mobile communication, mobile devices, and the internet (Lan and Sie, 2010). It means that mobile learning is closely related with nowadays learners' situation that lives in technology development era. Particularly, with the mobile technologies, learners and instructors should make different activities which are more motivational and more interesting from traditional activity (Ozdaml and Cavus, 2011). So, by using android application as the mobile device of digital media, students can create and bring their mind map just by using their smartphone that can be used anytime and anywhere. The students do not need obvious stationary and a long time to think

about their map shape and how to connect each node properly because the device can be used simpler than it. Just organize the ideas and choose some types, color, and background, then the proper mind map can be gotten. In consideration of all this, the researchers conducted a study on the effectiveness of mind mapping technique through android application.

In relation to mobile learning of mind mapping, mi-Mind is might be applicable since they may use an easy device to create their mind map. Many researchers have been conducted dealing with mi-Mind in the scope of mind mapping activities. For example, Hermawati et al. (2019) who stated that mi-Mind application gave significant effect (positive) towards students' achievement that is 33 as the highest percentage. They said this application is very good to be implemented at school, especially in English course, because the learning process ran more effective, efficient and innovative, saving time, and students also can learn everywhere. It is possible for students to keep learning even though they do not do face-to-face class. Another research came from Golovatina and Golovatina-Mora (n.d.:2) stated that mi-Mind is an appropriate application that can help the students to develop a mind map. In line with this, Castillo and Gullen (2020) who stated that *miMind* was an ideal digital application for retrieving and organizing information in Harmonic Mind Maps.

However, all the previous studies purely only implemented the concept of manual mind mapping in reading comprehension of narrative text, or students only use *miMind* application for their digital learning achievement. By modifying this mind mapping, that is the concept of *miMind*, it will provide the students an ideal and appropriate digital application for doing mind map of narrative text. Moreover, hopefully it will facilitate the students' mind mapping activity, so that they can comprehend their reading of narrative text properly. *MiMind* mobile application was used for digital learning which is considered more effective and enjoyable than the manual verse, and mind mapping was used as simple note and graphic organizer of the ideas of narrative text that is comprehended by students. When the students can enjoy their learning, they can read and understand the text easier. Therefore, a success in comprehending a text will be easily achieved. It is also related to their perception. Furthermore, the students's responses related to

the use of mind mapping technique which is modified by android mobile learning, whether it can motivate their learning or not, can also be seen from the result of questionnaire as one the instruments of this research.

Based on the explanation above, the researcher is highly motivated to conduct a research about Improving Students' Reading Comprehension by Using Mind Mapping Technique through *miMind* Application as Android based Mobile Learning at The First Grade of SMA N 1 Sumberejo in Academic Year 2020/2021.

1.2 Formulation of the Problem

Based on the background of the problem above, the research questions to be focused on:

1. Is there any significant difference of using mind mapping technique through *miMind* Application in improving students' reading comprehension of narrative text?
2. How do students respond to *miMind* Application as android based mobile learning?

1.3 Objectives of the Research

In relation to the formulation of the problem, the objectives of this study are:

1. To find out the significant difference of using mind mapping through *miMind* Application in improving students' reading comprehension of narrative text.
2. To know the students' responses toward *miMind* Application as android based mobile learning.

1.4 Uses of the Research

This research is useful both practically and theoretically as the following uses:

1. Theoretically, to verify previous theories dealing with mind mapping technique.

2. Practically, the uses of this research are:
    a. To be consideration for English teacher to apply mind mapping technique through *miMind* Aplication in teaching reading comprehension of narrative text in their classroom.
    b. To encourage students' awareness of identifying the specific information in various type of reading text through mind mapping technique.
    c. To motivate the students in identifying narrative text by using mind mapping technique through *miMind* Application.

1.5 Scope of the Research

This research was quantitative research. It was conducted at SMA N 1 Sumberejo, Tanggamus, Lampung. The researcher took one class as the subject in SMA N 1 Sumberejo. There were seven classes of the first grade in SMA N 1 Sumberejo. The researcher took the class randomly by lottery and the class was academic year 2020/2021 that consisted of 36 students. This research focused on students' reading comprehension of narrative text by using mind mapping technique through *miMind* Application. The students' reading achievement was measured by a set of pre-test and post-test in the form of multiple choices. Not only that, the researcher also used qustionnaire to know the students' responses toward *miMind* Application as android based mobile learning after being taught by using mind mapping technique through the stated application.

1.6 Definition of Terms

Some terms are defined in order to give basic understanding of the related variables and concepts. Those are stated below:

1. Reading comprehension

    It refers to the meaning constructed as a result of the complex and interactive process relating a reader's critical thinking, prior knowledge, and inference-making (Aloqaili, 2012:36).

2. Narrative text

It refers to a story tells us about something interesting that has purpose to amuse and entertain the readers or viewers (Novla, 2016).

3. Mind Mapping

It refers to a visual technique that presents the knowledge, ideas, concepts an relationships between them in an individual's mental construction on a two-dimensional plane (Evrekli, et al., 2010:2330).

4. Mobile learning

It refers to learning that occurs when learners have access to information anytime and anywhere via mobile technologies to perform authentic activities in the context of their learning (Martin and Ertzberger 2012:77).

5. *miMind* Application

It refers to one of the many apps with which it is possible to draw mind maps. This educational method, traditionally using paper and colorful pens, has been used for many years (Wegrezyn-Odzioba, 2018:144-145).

II. LITERATURE REVIEW

This chapter presents literature review related to the teaching of reading skill in the research. Theoretical review is divided into seven sub headings: reading comprehension, the purposes of reading, narrative text, mind mapping, mobile learning, *miMind* mobile application, and teaching reading comprehension of narrative text through *miMind* application as the mind mapping android based mobile learning. Specifically, reading comprehension theories deliver into some points: the definition of reading comprehension and factors influencing reading comprehension. While, mind mapping theories state into some points: the concept of mind mapping, the purposes of mind mapping, the procedure of mind mapping, and the advantages and disadvantages of mind mapping. Thence, mobile learning theories also state into some points: the definition of mobile learning and the concept of android based mobile learning. Last, *miMind* application theories deliver into some points: the concept of *miMind* application, the procedure of using *miMind* application, and the advantages and disadvantages of *miMind* application. In addition, there are also previous studies, conceptual framework, and hypothesis in this chapter.

2.1 Reading Comprehension

2.1.1 The Definition of Reading Comprehension

According to Ahmadi et al. (2013:238), reading comprehension is a complex process involving a combination of text and readers. In addition, Aloqaili (2012:36) viewed that reading comprehension can be defined as the meaning constructed as a result of the complex and interactive process relating a reader's critical thinking, prior knowledge, and inference-making. In line with Aloqaili, Nillson (2014:341) stated that reading comprehension is assumed to involve the construction of meaning

of a passage from written text. Another definition is viewed by Gilakjani and Sabouri (2016:182). They viewed that reading comprehension is a complicated subject that includes many levels of a text.

Based on those definitions as mentioned above, it can be concluded that reading comprehension is a complex and interactive process involving the construction of meaning from many levels of written text that is relating a reader's critical thinking, prior knowledge, and inference-making.

2.1.2 Factors Influencing Reading Comprehension

According to Shehu (2015:29-30), there are two factors that influence students' reading comprehension: the internal factor and the external factor. Particularly, the internal factor which can be defined as the factor that comes from the reader himself consists of motivation and interest.

Motivation is very important in analyzing a text. It also plays an important role in comprehending it. Brown (2001:75) in Shehu (2015:29) divided the motivation theory into two kinds, they are: intrinsic and extrinsic motivation. He continued defines intrinsic motivation as follows: *"Intrinsically motivated activities are ones from which there is no apparent reward except the activity itself. People seem to engage in the activities for their own sake and not because they lead to an extrinsic reward. It is aimed at bringing about curtaining internally rewarding consequences, namely, feelings of competence and self-determination."* On the other hand, extrinsic motivation is defined by him as extrinsically motivated behaviors that carried out in an anticipation of a reward from outside and beyond the self, such as money, prizes, grades, and even certain of positive feedback.

Apart from motivation, another important internal factor is interest. Interest is being one of the important factors that influence in increasing the students' comprehension achievement in reading (Shehu, 2015). Due to the fact, if the readers, in this case are students, interested in

reading a text, they can get a satisfied achievement. In contrast, if they have no interest to read a text, they can get an unsatisfied achievement. Thus, it can be assumed that motivation and interest are influencing students' achievement in reading comprehension, either satisfying or unsatisfying.

On the opposite of internal factor is external factor that can be defined as the influence which comes outside the reader himself. There are three aspects in external factor, those are reading material, teacher of reading, and questioning strategies.

The first external factor is reading material. One of the students' achievements in reading is influenced by the level of difficulty of the text. Additionally, Shehu (2015:29) stated that some texts are considered to be more difficult, such as texts which lack of organization, have plenty of new words, scientific text, etc. As a result, students cannot understand what they read if the text given is more difficult than the students' level of understanding difficulty.

Another thing considered as the external factor of reading comprehension is the teachers of reading. The teachers should be careful to select the reading material and kind of the comprehension. Moreover, they need to have an appropriate technique to teach their student properly.

Question strategy is a crucial external factor in teaching reading comprehension. Teachers should know how to select a strategy of questioning the text, so that their students can being motivated by it. According to Brown (2001:169) in Shehu (2015:29), the most important key to create an interactive learning is the initiation of interaction from the teacher by using question. Furthermore, he continued states the appropriate questioning can fulfill a number of different functions, such as:

1. Teacher questions give students the opportunity to produce language comfortably without having to risk initiating language themselves. It is very scary for the students to have to initiate conversation or topics for discussion.

2. Teacher question can serve to initiate a chain reaction of students' interaction among themselves.
3. Teacher questions giving immediate feedback about students' comprehension.
4. Teacher questions provide students with opportunities to find out what they think. As they are nudged into responding to questions about, say, a reading, they can discover what their own opinions and reactions are. This self-discovery can be especially useful for a pre-reading activity.

If the teacher lacks of the above points, the results will not be a satisfactory level (Shehu, 2015).

2.2 The Purposes of Reading

Everyone has their own purpose. Even though doing the same thing, the purpose can be different. It also occurs in purpose of reading. Somehow, when people read a text, it indicates that they have a purpose towards what they read. Although they read some fictions, such as novel, short story, and any kind of similar text for pleasure, they also have a purpose, at least to get the information of the story in a text which they read.

There are many experts who define the purpose of reading. Mostly, their definition state that reading has two main purposes: reading for pleasure and reading for getting information (Indrayani, 2014:11). Furthermore, Smith (2020) stated the purposes of reading as follows:

"Everyday reading, such as reading a novel or magazine, is usually done for pleasure. Academic reading is usually quite different from this. When reading academic texts, your general purpose is likely to be one of the following:

a. to get information (facts, data, etc.);
b. to understand ideas or theories;
c. to understand the author's viewpoint;
d. to support your own views (using citations)"

To sum up, if the students have purpose in reading a text, it will lead them to achieve what they are looking for, such as ideas and information. Whatever the purpose of reading, the students will get something from what they read.

Additionally, for maximizing the comprehension, the students need an appropriate technique in their reading.

2.3 Narrative Text

2.3.1 The Definition of Narrative Text

Narration is the act of telling a sequence of events (Suherman, 2015). Furthermore, Indrayani (2014:1) stated that narrative text is a text which is used to amuse and entertain the readers through its story. In line with Indrayani, (Novla, 2016), narrative text is a story tells us about something interesting that has purpose to amuse and entertain the readers or viewers.

To sum up, narrative text is one of types of text which tells a story to amuse and entertain the readers.

2.3.2 The Purpose of Reading Narrative Text

Knapp and Watkins (2005:220-221) in Novla (2016:21) stated that narrative has social role as a medium for entertainment and changing social opinions and attitudes. It can be seen when people read a story of narrative text, either from novel or short story, people tend to get jollity. It indicates that the purpose of reading narrative text is to entertain or amuse them.

2.3.3 The Generic Structure of Narrative Text

Referring that narrative text is a story, thus it must show in chronological order. It means narrative text has a generic structure for its story. The generic structure of narrative text can be represented graphically as the following triangle (Novla, 2016:22):

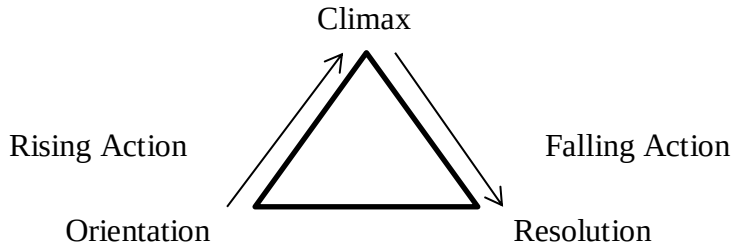

Figure 1.1 Generic Structure of Narrative Text

The figure of triangle above is called Freight Triangle. It consists of: the orientation (established the characters and situation); rising action (series of complication leads to the climax); the climax (critical moment); falling action (the moment away from the highest peak of excitement); and resolution (the result or outcome) (Karolina, 2006) in Novla (2016:22).

2.3.4 The Example of Narrative Text

Table 1. Example of Narrative Text entitled Cinderella

Orientation	Once upon a time, Cinderella lived with her mother and father. Sadly, her mother was died and her father got remarried. Her stepmother had two daughters, so Cinderella had two step sisters. They were so nice to her and Cinderella was so happy about that.
Rising Action	One day, her father had to go to out of town for working. Cinderella was left at home with her stepmother and step sisters. They acted differently towards her. They were so cruel and asked Cinderella to be their maid. She was so sad about that. After few days, Cinderella got bad news that her father was died in accident while working. Her stepmother and step sisters treated Cinderella even worse. She was not allowed to have a good meal , dresses, shoes, and stuff, and proper room and bed for her.
Climax	On the other side, there was a King that looking for a wife for her son. Therefore, he held a party and invited all the girls. Cinderella wanted to come to the party, but her stepmother and step sisters definitely forbade her to come. She was so sad looking her stepmother and step sisters went there beautifully.
Falling Action	A fairy felt so sorry about her and helped her

	by giving her beautiful dress, shoes, and train to go there. She went there and met the Prince. They danced all along the night. Unfortunately, she had to be back at home before 12 or she turned into the way she before. They were separated, but Cinderella accidentally left her shoe, because she was in hurry.
Resolution	Next day, the Kingdom especially the Prince looked for the owner of the shoe. All girls tried to wear that shoe, but no one seemed to be the owner. Cinderella appeared and tried the shoe. She was the owner of the shoe, so the shoe fitted on her. The Prince was so happy that he finally met her. Cinderella and the Prince got married and lived happily ever after.

2.4 Mind Mapping

2.4.1 The Concept of Mind Mapping

Every single part in the world has their history, as well as teaching techniques, such as mind mapping. Developed by Tony Buzan toward the end of 1960s, mind maps have been employed in many different areas since their development; yet, they have also become a subject of educational research recently (Evrekli et al., 2010). In addition, Adodo (2013:164) stated that Buzan introduced mind-mapping method to the world with his books and developed a system which would pave the way for many people. According to Tee et al. (2014:28), Buzan mind mapping is an efficient system of note-taking that makes revision a fun thing to do for students. Furthermore, they view that Buzan mind mapping is a visual tool used to organize and relate themes or objectives. In line with Tee, Evrekli, et al. (2010:2330) stated that mind mapping can be described as a visual technique that presents the knowledge, ideas, concepts and relationships between them in an individual's mental construction on a two-dimensional plane.

Adodo (2013:163-164) stated that concept of mind mapping is a method that can be used to visualize the structure of knowledge, expressed in the maps is mostly semantic: concept maps are sometimes called semantic network. In addition, he states that in a mind-mapping as opposed to traditional note-taking or a linier text, information is structured in a way that resembles much more closely how your brain works. It is an activity that is both analytic and artistic. Additionally, Adodo (2013:164) gave the summary in differentiating of concept maps and mind maps. However, in this case, just mind maps provided, as follows:

1. Mind maps tend to be more flexible and personal the concept maps.
2. Mind maps are used to slice and dice the map's central topic or concept in multiple ways.
3. Mind maps may certain images and color, to make them more visually stimulating.

To sum up, mind mapping is an efficient visual tool in note-taking technique that was developed by Tony Buzan with his books at the end of 1960 to organize and relates themes or objects. The concept of mind mapping itself is a method that is used to visualize the structure of knowledge and ideas that is analytic and artistic by using certain images and color to central topic or concept in order to more stimulate visually.

2.4.2 The Purposes of Mind Mapping

According to Tee et al. (2014:30) mind maps help students remember information, as they hold it in a format that the mind finds easy to recall and quick to review. Furthermore, they viewed mind mapping as note taking technique, the mind map allows individual to "organize facts and thoughts" in a map format containing a "central image, main themes radiating from the central image, branches with key images and key words, plus branches forming a connected nodal structure".

In line with the purpose of mind map, information of a source was adapted at the *Language and Learning Online* website at Monash University Library is cited as follows:

"A mind map is a visual representation of your ideas, consisting of words, images, and colors, and can help you to:

1. *focus on your research topic/question*
2. *structure and plan your assignment*
3. *combine one or more types of major relationships*
4. *identify relationships between ideas/concepts"*

From the stated purposes above, it can be assumed that mind mapping has many purposes depends on the creators of mind maps itself, in this case is students, such as to organize ideas, plan the assignment, focus on a topic, and so much more. Certainly, it helps the students in remembering and recalling the material of their mind maps to get better understanding in learning.

2.4.3 The Procedure of Mind Mapping

There are three steps of mind mapping as stated in information of a source that was adapted at the *Language and Learning Online* website at Monash University Library in Jones, et al. (2012) as follows:

Step 1: Brainstorm:

1. Write the topic in the center of a blank page.
2. Use colors, pictures, words, and symbols to record any ideas, topics, researchers, or theories that are associated with the topic. You can place anywhere on the page. Associate freely and do not filter out ideas at this point; anything and everything is okay.

Step 2: Organization:

1. Map the relationships between ideas or key points using lines, arrows, colors, and words to link them.
2. Identify the type of relationship between ideas or points, such as: contrasts, similarities, cause and effect. Write these relationships along the linking lines.

Step 3: Mind Map:

1. Once you are comfortable with the associations and organization in your brainstorm, then use the ideas that you have developed to draw out your final mind map.

2.4.4 The Advantages and Disadvantages of Mind Mapping

1. The Advantages of Mind Mapping

   Adodo (2013:165) stated that mind maps are useful for:

a. Brainstorming-individually, and as a group.
b. Summarizing information, and note taking.
c. Consolidating information from different research sources.
d. Thinking through complex problems.
e. Presenting information in a formal that shows the overall structure of your subject.
f. Studying, retaining and recall information.

It can be assumed that mind mapping has many advantages, such as retaining and recall information in the form of summarize a topic. It indicates that mind mapping is effective to help students remember information of a concept of ideas easily.

2. The Disadvantages of Mind Mapping

In contrast, Tucker, et al. (2010:4) viewed disadvantages of mind maps as follows:

a. Cannot be digitally stored other than scanned document
b. Map size is limited
c. Preference of user for mind mapping software advantages

Additionally, some of Yunus, et al. (2016:624) findings toward the disadvantage of mind mapping in his research are provided as follows:

a. Some students dislike creating mind maps
b. Students who have insufficient skills to draw need a long time to make a mind mapping
c. It is difficult for students to familiarize with the concept of mind mapping in examination situation

From the stated disadvantages above, it can be assumed that mind mapping is a complicated technique, especially for students who dislike the process of creating mind mapping. Nevertheless, this weakness can be solved by the teachers giving clear instructions to clear the students doubt and limited time frame for the students to create mind maps more efficiently (Yunus et al., 2016:624).

2.4.5 The Example of Buzan Mind Mapping

Tee et al. (2014:28) stated that Buzan mind mapping is a visual tool used to organize and relate themes or objectives. Furthermore, he adds Buzan asserts that mind maps that incorporate pictures and different colors bring ideas to life.

The following hand-drawn mind map in Figure 1.1 is one of examples of mind mapping by Buzan.

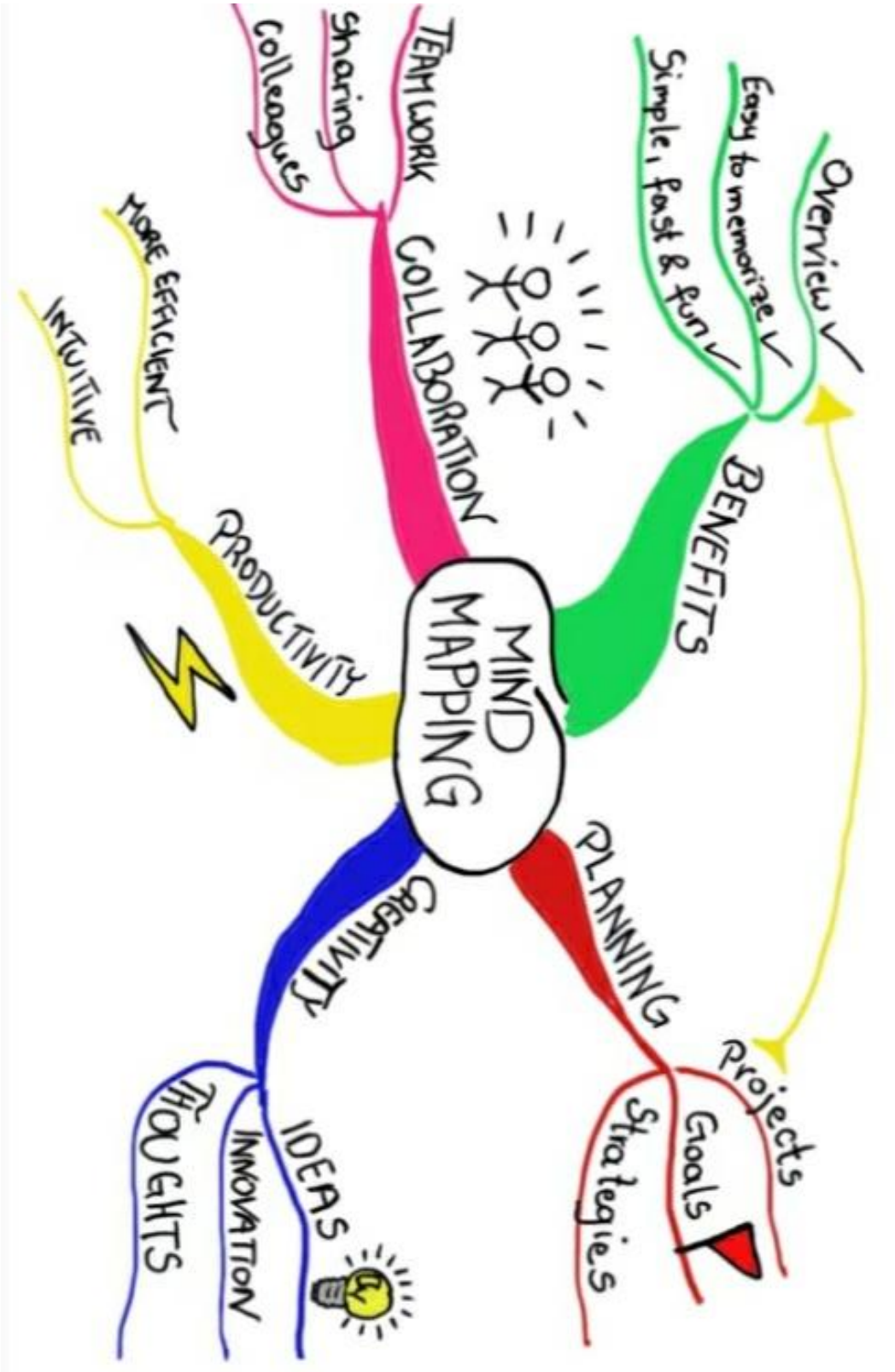

Figure 1.1 Hand-Drawn Mind Map by Buzan (Brandner, n.d.)

2.5 Mobile Learning

2.5.1 The Definition of Mobile Learning

According to Kinash et al. (2012:639), mobile learning in scholarly literature is the use of portable devices with internet connection capability in education context. Park (2011:79) added that mobile learning refers to the use of mobile or wireless devices for the purpose of learning while on the move. Furthermore, Wu et al. (2012:826) viewed mobile learning is most prevalent at higher education institutions, followed by elementary schools. Farley et al. (2013:283) stated that mobile learning is increasingly seen as a boon to universities and educators as a means of enabling learning anywhere, anytime and the convenience of the learner. In addition, mobile learning is defined by Martin and Ertzberger (2012:77) as learning that occurs when learners have access to information anytime and anywhere via mobile technologies to perform authentic activities in the context of their learning.

From the definitions above, it can be summarized that mobile learning is the educators' use of portable or wireless devices via mobile technologies with internet connection in the context of learning activities for enabling learning anywhere and anytime.

2.5.2 The Concept of Android Based Mobile Learning

A new trend in e-learning nowadays is known as Mobile Learning the use of portable media such Smartphone either using the Android system, IOS, or Windows Phone (Martono and Nurhayati, 2014:169). M-Learning which is empowered by recent advancements in mobile technology operating systems, notably the ubiquitous android platform (Hanafi and Samsudin, 2012:1). Furthermore, he added that mobile phones based on android platform have become an indispensable communication device for many people, particularly in younger segments of the population, such as school students. Due to the fact, mobile learning systems based on android technology are poised to dominate the M-Learning realm given the rich, appealing multimedia contents such as

audio, videos, animations that can be downloaded effortlessly into students' mobile devices.

Mobile learning system powered by android technology can make learning more fun, interactive, and intuitive (Hanafi and Samsudin, 2012). By using the application of mobile learning, the learning process can be more flexible since it can be done anytime, anywhere and in any condition (Martono and Nurhayati, 2014:174).

2.6 *miMind* Mobile Application

2.6.1 The Concept of *miMind* Application

miMind is one of the many apps with which it is possible to draw mind maps. This educational method, traditionally using paper and colorful pens, has been used for many years (Wegrezyn-Odzioba, 2018:144-145). She added that *miMind* is a special way of making notes, owing to which effectiveness of work and remembering is increased. Furthermore, this method has been developed by two British Scientists: Tony and Barry Buzan. Wegrezyn-Odzioba also stated that there are various ready-made mind map models available in the application, as well as drawing and writing tools, it is also possible to paste images and photos, and to add hyperlinks. After it is completed, it can be published or saved in various formats. She views *miMind* is a perfect tool for content visualization. In line with Wegrezyn-Odzioba, Hermawati et al. (2019:35) proved that creating mind mapping through *miMind* application gives positive effect for students' learning achievement.

Additionally, Crypto Bees (n.d.) explained *miMind* in details. *miMind* is a powerful mind mapping tool designed to create and share ideas and activities, such as project planning, brainstorming, ideas, designing, thought structuring, summarizing ideas, discussions, poster presentation, project demonstrations, and many other creative applications. *miMind* is useful for:

1. note taking, scrapbooks, slides, presentation, flash cards
2. project planning and management at work, home and businesses

3. helps with staying focused, goal settings, color-coding, assignments, qualitative analysis, budgeting
4. creative writing: novel, fictions, speech, summary (summarize things)
5. add images, audios and memories
6. Maps: topological networks, not-to-scale road maps, vector drawing
7. Trees: multi-layered, binary, radix, decision
8. Diagrams: graph, flow charts, abstract design, class (UML), state, data flow, complex, Venn
9. and much more: Imagination is Limitless.

miMind can be downloaded for iOS and MacOS directly on iPhones, iPads and MacBooks from the respective App Stores. Similarly, *miMind* for Android can be installed from the Google Play Store on Android devices. While, *miMind* for Windows PCs is now available download with a link on *miMind* developer website. The base version is free on all available platforms. Currently, upgrade to premium version with advance features is available for purchase on Windows, Android, Mac and iOS platforms.

2.6.2 The Procedure of Using *miMind* Application

The following steps by Crypto Bees will help in using the *miMind* app:

1. Create A New *miMind* Map File
   a. Start the app, or go to the main menu list,
   b. Click '+' icon on top right corner
   c. Enter a name for your file
   d. Select a desired layout schema, and click 'Next' button
   e. Select a desired color schema, and click 'Finish'

2. Add A New Node

A node is a vertex of the graph/map. You can place title, body text, images, lists, checkboxes, and many other controls

inside or outside a node. There are two types of nodes: Root node and Sub-nodes (child nodes).

a. Root Node

Root node is a top-level node in a graph or tree without any parent node. All other nodes are the children of root node. There can be multiple root nodes in a map file, but each connected tree or graph can have only one root node.

The following steps can be followed to create a root node:

1. Open the map file if it is not already open.
2. Select 'New Node' from top right menu (or long press on the empty space for a menu).
3. Enter a desired name for the node, and click 'Add'.

b. Sub-node

Sub-node is a node that has a parent node. Feature wise, it is very similar to the root node. This is the following steps to add a sub-node:

1. Click on an existing node, Select 'Add Node' from the cornered tool bar. The new node will be created as a child node to the selected existing node.
2. Enter a desired name for the node, and click 'Add'.

3. Apply Layout Schemas

Layout schema regulates the position of nodes and line styles based on direction and type of layouts. Applying a layout schema on a node also helps avoiding node overlapping among the child-nodes of the applied node.

Layout schema works best on a tree-like map layout where every node in the tree follows similar line pattern. It is possible to change the node positions or line styles manually after applying the schema, however reapplying a layout, or further editing the map may revert to the original positions again.

Layout schema for a new map can be selected from a start-up wizard creating a new map. Also any existing map can change its layout schema any time from a node selection menu by following the steps below:

a. Select a node and click on 'Schema' from the cornered tool bar.
b. Select 'Layout Schema' on the next menu.
c. A dialog should appear with a 'Sub-node Layout' button. Click on the button.
d. Choose a layout by clicking on the corresponding layout buttons and direction radio-buttons.
e. Preview window should update based on your selection, which makes it easy to choose from all available layouts. Click 'OK' on completion.
f. You may also apply a line style to all connecting lines by checking the 'Apply Line Style' check-box and selecting different line properties.
g. Click 'OK' on completion.

Tip: It is usually best to apply the layout schema on a Root node, and after you adding or editing all nodes in a tree or graph.

Tip: Select a free-form layout to manually layout the positions of the nodes. You can also change the line styles of free-form layout to straight lines or any other types.

4. Apply Color Schemas

Color Schema decides the color of the nodes and lines based on selected color palette. It provides an easy way to manage colors without worrying about changing each node and line colors. One may also choose to apply custom color from color picker dialog and line style dialog if required.

Color schema for a new map can be selected from a start-up wizard when creating a new map. Also any existing map can change its layout any time from a node selection menu by following the steps below:

a. Select a node and click on 'Schema' from the cornered tool bar.
b. Select 'Color Schema' on the next menu.
c. A dialog should appear with different color schema options, and a preview window to help you decide on a selection.
d. Color Palette Buttons: Click on a color palette button to select a palette.
e. Branch Colors: Every branch will have separate colors from the chosen palette, i.e., each child node of current node will have separate colors from the palette, and children of child nodes will follow child node colors.
f. Level Colors: Each level in the tree will have separate colors from the chosen palette. Root Node is level 1 taking the first color from the palette. All children of root node are level 2, thus taking the second color from the palette, and so on.
g. Origin Line Color: Connecting line colors will be same as adjoining parent (origin) node color.
h. Target Line Color: Connecting line colors will be same as adjoining child (target) node color.
i. Click OK on completion.

5. Apply Line Styles

miMind offers many line style properties to enhance the look-and-feel of the connecting lines between the nodes. Line style can be changed from the following line style dialog or the layout schema dialog.

a. Click on a line, and then click on the central 'Edit' icon to open the line style dialog.

b. Select one of the line styles: Curve, 1-cornered, 2-cornered lines or straight lines.
c. Click the 'Line Pattern' button to select dashed lines, double lines, and other patterns.
d. Click the 'Line Color' button to choose a line color.
e. Select a line ending style for both line endings to arrows, diamonds, circles and other shapes.
f. Click 'OK' on completion.

Tip: Check the 'Set as Default' check-box on the line style dialog to make the selection default. Any new lines created after setting the default will automatically apply the default line style.

6. Change Node Shapes

MiMind offers a wide range of shapes inventory to choose from. Follow the steps below to open the shape selection dialog and change a node shape:

a. Select a node and then click on 'Shape' icon from the cornered-toolbar.
b. Select a desired shape from the dialog.
c. You may also wish to enable or disable the frame or shape shadow by checking the corresponding check-boxes.
d. 'Apply to sub-nodes' check-box can be set if you want to apply the changes to the selected node and to its children.
e. Click 'OK' on completion.

Tip: 'Keep 1:1 Aspect Ratio' check-box can be set if you want to keep the node's height and width equal. This will make rectangles to square, and ellipses to circle, and so on.

Tip: Check the 'Set as Default' check-box on the shape selection dialog to make the shape default. Any new nodes created

after setting the default will automatically apply the default shape.

7. Change Colors Of Text, Frame, Node Background

Text color, frame and background of a node can be changed from the color picker dialog:

a. Select a node and then click on 'Color' icon from the cornered-toolbar.
b. A color picker dialog should appear:
c. Select 'Fill' for node background color, 'h4' for text color, and 'Frame' for frame color.
d. Pick a desired color for each of the above using the color wheel and color square respectively.
e. 'Apply to sub-nodes' check-box can be set if you want to apply the changes to the selected node and to its children.
f. Click 'OK' on completion.

8. Group/Ungroup Nodes

A node and its children can be grouped in a colored panel. This can be done from the node selection cornered-toolbar by selecting 'Group'. Once grouped, it can also be removed by selecting 'Ungroup' from the same toolbar.

9. Add Images

Images (pictures) can be added to both outside and inside a node by clicking on 'Image' icon from the node selection toolbar. After adding an image, it can be resized or moved to different position by selecting the image.

10. Add Audio Files

miMind includes a mini-audio (sound) player supporting different audio formats: mp3, wav, etc. Audio files can be added

to a node by clicking on 'Audio' icon from the node selection tool bar. After adding a file, it can be played in a view mode (available from top right menu).

11. Save and Export

A map file can be saved in *miMind* format, and exported to many different formats such as JPG Image, PNG Image, Targa Image, BMP format and PDF file format. All these options can be accessed from the top-right menu.

12. Share A Map

Also the image of the map or the map itself can be shared with friends and families on various social media platforms, chat applications, emails and more from the device. In order to share a map, open/create a map, select 'Share' from the top-right menu, and follow the instructions.

2.6.3 The Advantages and Disadvantages of *miMind* Application

1. The Advantages of *miMind* Application

The advantages of *miMind* application can be seen in the features provided by Crypto Bees in *miMind* application itself as follows:

a. User friendly, intuitive, easy to use/navigate, and unique interfaces,
b. *miMind* is simple, flexible and smart UI.
c. Export to many formats: images (jpeg/jpg, PNG, TGA, bmp/bitmap), PDF, text, xml files
d. No ads/advertisements, no sign-up required, completely free
e. Multi-level, logical, hierarchical frameworks, many layout schemes
f. Contains of lines and curves, shapes (square, rectangle, oval, circle, hexagon, cloud, octagon, etc.)

g. Online backup, storage, and restore
h. Copy paste, duplicate, detach reattach nodes
i. Undo redo, collapse expand, zoom scroll, crop rotate, drag-n-drop

For giving brief information, the advantages can be seen by looking at some reviews from users of this app in play store as follows:

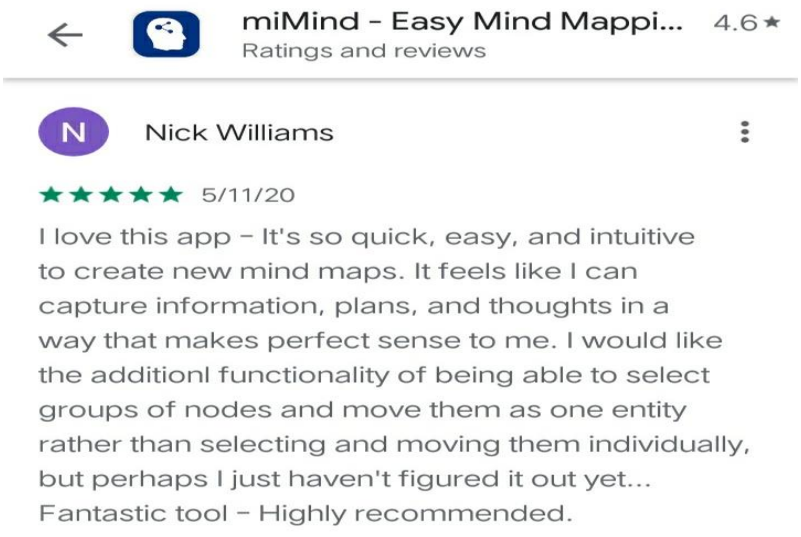

Figure 1.3 First advantage

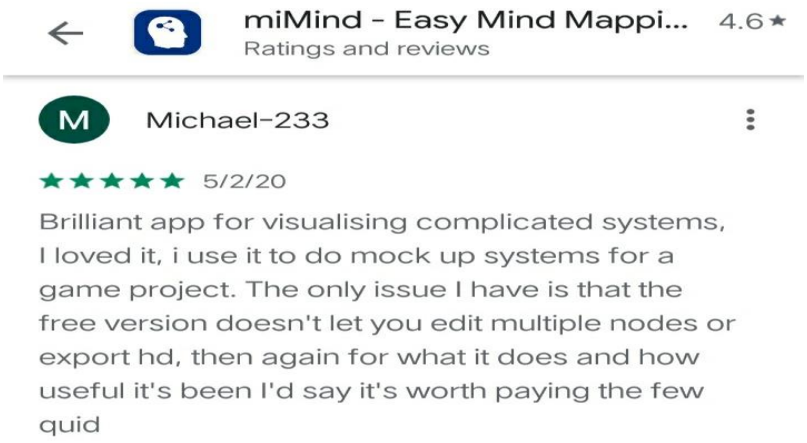

Figure 1.4 Second advantage

Figure 1.5 Third advantage

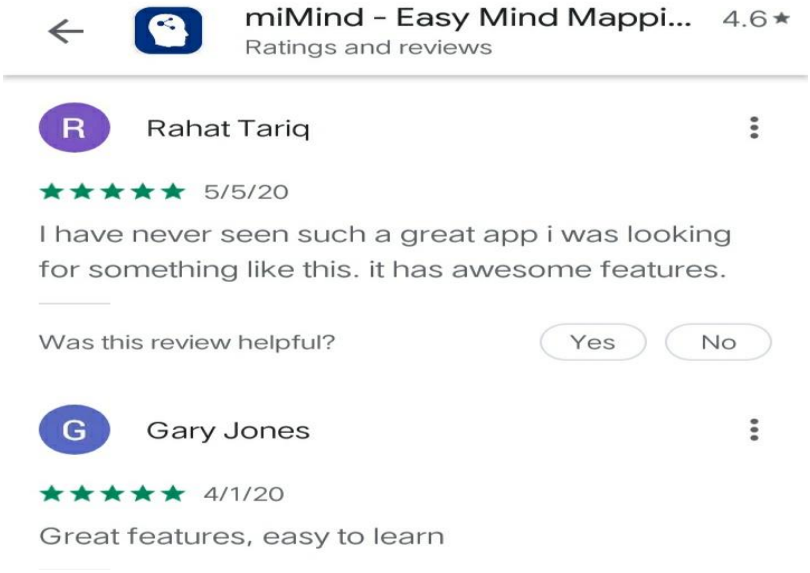

Figure 1.6 Fourth advantage

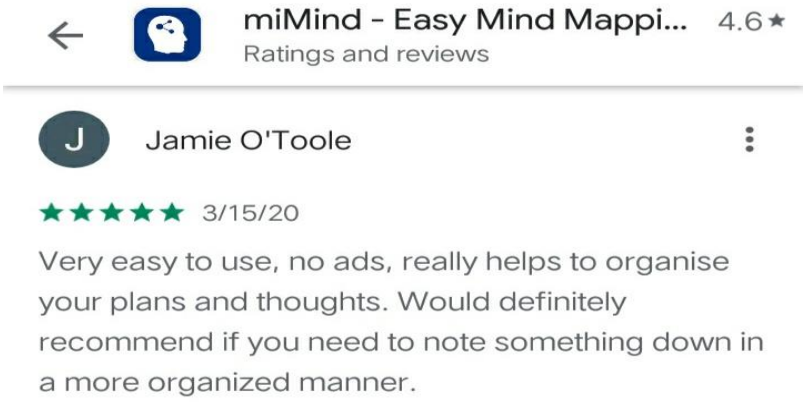

Figure 1.7 Fifth advantage

From some of reviews on the figures above, it can be concluded that *miMind* has some advantages in some scopes as follows:

a. Easy to use
b. Useful
c. Great tool
d. Feature-rich

2. The Disadvantages of *miMind* Application

Talking about the disadvantages of *miMind* application, it leads to know the disadvantages of software-drawn map in general first, viewed by Tucker et al. (2010: 4) as follows:

a. High-cost of none free-source software
b. Requires computer access, in this case is android access
c. Learning curve of using software
d. Map design flexibility restricted by software option
e. Preference of user to hand-drawn map
f. Map sharing restricted by format incompatibility

Specifically, the disadvantages of *miMind* Application can be seen by looking at some reviews from users of this app in play store as follows:

Figure 1.8 First disadvantage

Figure 1.9 Second disadvantage

Figure 1.10 Third disadvantage

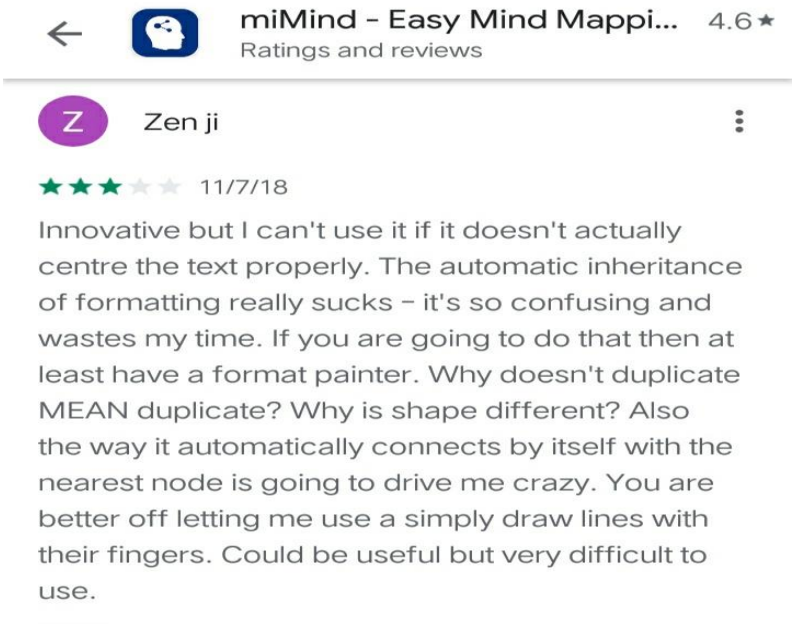

Figure 1.11 Fourth disadvantage

In contrast with the advantages above, *miMind* application also has the disadvantages as follows:

a. It is wasting time if the creators' of mind map will make a flawless perfect map
b. The steps are complicated for beginner
c. No support for directed acrylic graphs
d. Sometimes it is not compatible with some devices

2.6.4 The Example of Mind Mapping by Using *miMind* Application

Having done the steps of using *miMind* application, the following figure is one of the simple examples of mind mapping by using *miMind* application:

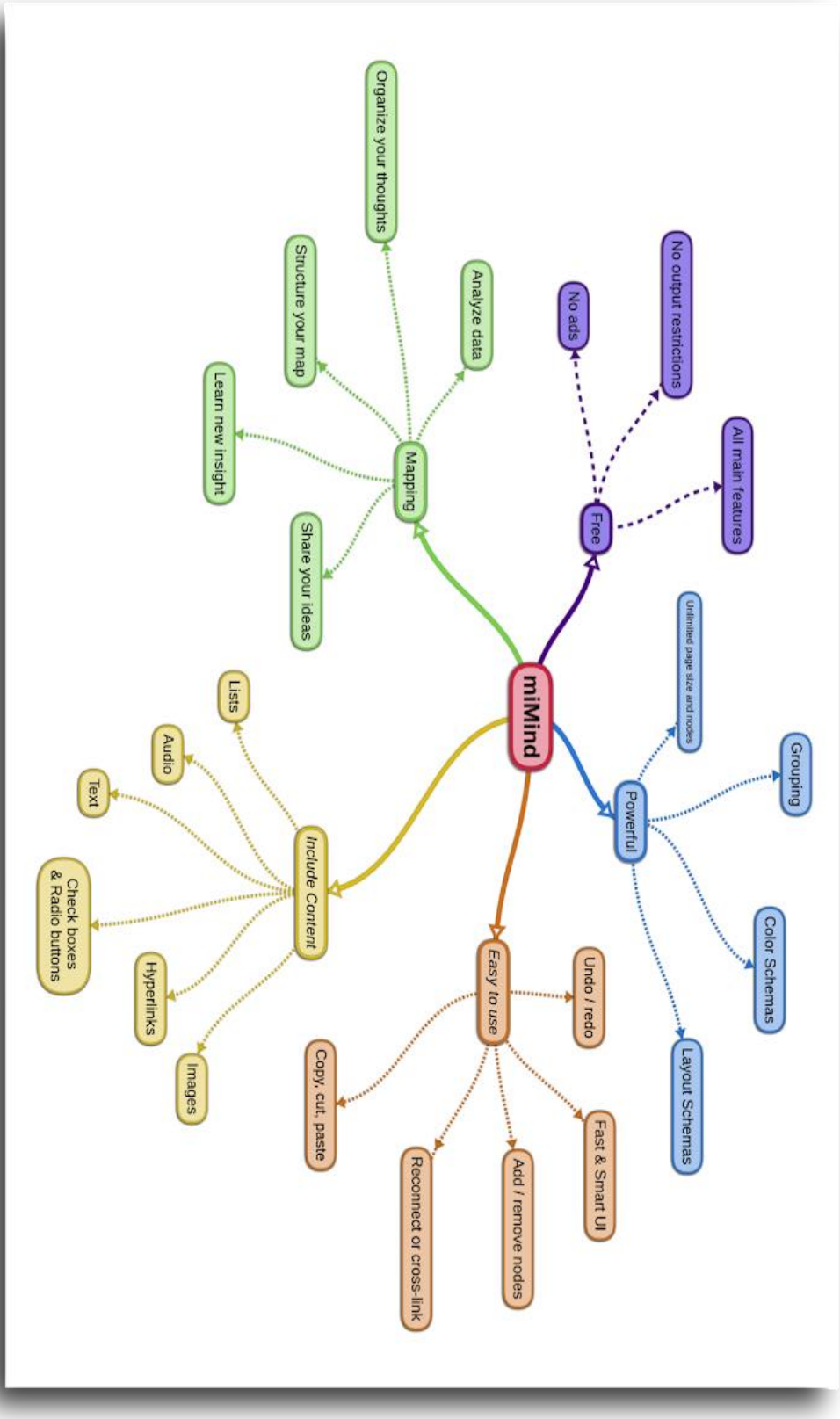

Figure 1.13 Mind Mapping through *miMind* Application

(CryptoBees, n.d)

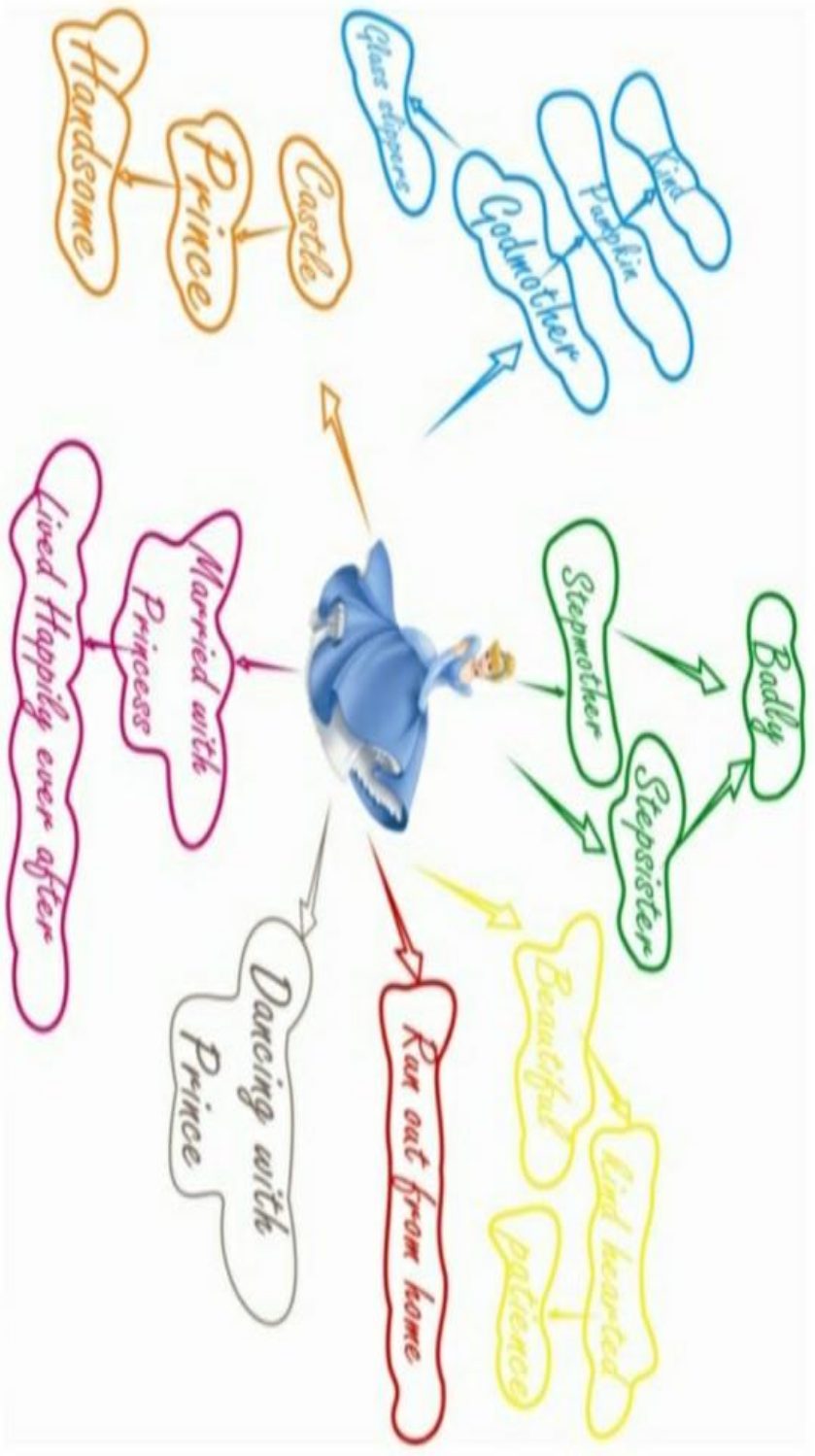

Figure 1.14 Mind Mapping of Narrative Text

(Cahyo, 2013)

2.7 Teaching Reading Comprehension of Narrative Text through *miMind* Application as the Mind Mapping Android Based Mobile Learning

The steps described below are the procedures of teaching narrative text through *miMind* application as the mind mapping android based mobile learning:

1. The teacher explains how to add a new map, choose map design, add node for word, pictures, and symbols and choose the color by using *miMind* application to record any ideas, topics, researchers, or theories that are associated with the topic. The students can place anywhere on the page.
2. The teacher gives an example of narrative text entitled Cinderella to the students.
3. The teacher together with the students make mind map by using *miMind* application.
4. The students type the topic in the center of a blank page by the guidance of the teacher.
5. The teacher gives guidance to arrange mind map about Cinderella related to the characters, setting, plot, conflict, and resolution to the students.
6. The students map the relationships between ideas or key points using lines, arrows, colors, and words to link them.
7. The students need to identify the type of relationship between ideas or points, such as: contrasts, similarities, cause and effect. Then, they have to type these relationships along the linking lines.
8. The teacher asks the students to submit their mind map via WhatsApp Group by clicking the share button on *miMind* application.
9. The teacher corrects and provides feedback to the students' mind map on WhatsApp Group.
10. The teacher gives 5 examples of reading test about Cinderella to the students that must be answered by the students by looking at their mind map.
11. The students need to submit their work to the teacher through personal chat on WhatsApp.
12. The teacher corrects and provides feedback to the students' work on personal chat and also WhatsApp Group.

2.8 Theoretical Assumption

According to Tee et al. (2014:30) mind maps help students remember information, as they hold it in a format that the mind finds easy to recall and quick to review. Furthermore, the advancement of technology leads the technique to use in concept of android based mobile learning. One of them is about application usage, in this case is mind mapping application, that is *miMind* application. By using mind mapping technique through *miMind* application as the device of mobile learning, the learning process can be more flexible since it can be done anytime, anywhere and in any condition (Martono and Nurhayati, 2014:174). It can also help students with staying focused, goal settings, color-coding, assignments, qualitative analysis, budgeting. It is found that students have better understanding to a text they read, in this case is narrative text. By having a better understanding, there is an improvement in their confidence in answering any questions either from the teacher or questions of an exam or test. Moreover, mind mapping through *miMind* application is a modified technique that is very good to be implemented at school, especially in English course, because the learning process ran more effective, efficient and innovative, saving time, and students also can learn everywhere (Hermawati et al., 2019). In addition, they said that it is possible for students to keep learning even though they do not do face-to-face class.

The steps in mind mapping technique through *miMind* application require the students to be more independent in reading activity from its first up to the last steps. It is also found that students' motivation is improved when they read independently. Through the independent reading activity, students are motivated to be independent readers like the other students who are already being independent readers in reading activity. The researcher also gave questionnaire to the students in order to know what were students' response toward mind mapping technique based android mobile learning in reading comprehension of narrative text. It can be assumed that mind mapping technique through *miMind* application can be used as an effective way to improving the student's reading comprehension in narrative text.

2.9 Hypothesis

Based on the theoretical assumption elaborated above, the researcher formulated the hypothesis that will be tested in this study as follows:

H_0: There is no difference between the students' reading comprehension in narrative text before and after the implementation of mind mapping technique through *miMind* application

H_1: There is a difference between the students' reading comprehension in narrative text before and after the implementation of mind mapping technique through *miMind* application

The criteria for hypotheses acceptance are: if the significant (p) value is less than the significant level (0.05) and t-value is more than the t-table, it means that H_0 is rejected. It shows that there is a difference between the students' reading comprehension in narrative text before and after the implementation of mind mapping technique through *miMind* application. If the significant (p) value is more than the significant level (0.05) and t-value is less than the t-table it means that H_0 is accepted. It shows that there is no difference between the students' reading comprehension in narrative text before and after the implementation of mind mapping technique through *miMind* application.

III. RESEARCH METHOD

To answer the research question and achieve the objective of the research, research method must be constructed thoroughly. The research method consists of research design, variables of the research, population and sample of the research, research instruments, try out of the instruments, and procedures of collecting data. Moreover, this chapter also explains about the criteria of a good test, research procedure, hypothesis testing and statistical testing.

3.1 Research Design

This research was a quantitative study since it was focused on the product (result of the test) not the process of teaching learning. This present study had *one group pre-test post-test design*. In this research, the researcher used regression study. Regression was used to predict the effect of dependent variable toward independent variable. The researcher selected the class by using *cluster random sampling*. The learners received the questionnaire. There were three treatments, the students were tested before and after the treatment. After the treatment, the students were given a set of questionnaire in order to know the students' response toward the technique being implemented. The research design can be represented as follow:

T_1 X T_2

T_1 : Pre-test

T_2 : Post-test

X : Treatment

(Setiyadi, 2018:113)

The study was to investigate whether mind mapping technique through *miMind* application can be used to increase students' reading comprehension ability in narrative text by comparing the average score (mean) of the pre-test with the average score (mean) of the post-test.

Firstly, the researcher administered a pre-test to the students to identify their achievement of reading comprehension ability in determining mind idea, references, inference, supporting detail, and vocabulary before applying the technique. Then, the students were given three treatments by using mind mapping technique though *miMind* application. Eventually, a post-test were administered to identify students' reading comprehension ability after being taught by using mind mapping technique through *miMind* application. If the average score of the pre-test was higher than the average score of post-test, it indicated that mind mapping technique through *miMind* application cannot be used to increase students' reading comprehension ability. However, if the average score (mean) of the post-test was higher than average score (mean) of the pre-test, it showed that mind mapping technique through *miMind* application can be used to increase students' reading comprehension ability in narrative text significantly.

3.2 Variables of the Research

A variable is a characteristic or attribute of an individual or an organization that (a) researchers can measure or observe and (b) varies among individuals or organizations studied. Measurement means that the researcher records information from individuals by asking them to answer questions. And when variables vary, it means that scores will assume different values depending on the type of variable being measured (Creswell, 2012:112) in Yanti (2017). In this research, there were two variables, they are independent variable and dependent variable.

An independent variable is an attribute or characteristic that influences or affects an outcome or dependent variable (Creswell, 2012:116) in Yanti (2017). Independent variable is the cause of other variable. Based on the definition

above, the independent variable of this research was the use of *miMind* application as the mobile learning of mind mapping.

A dependent variable is an attribute or characteristic that is dependent on or influenced by the independent variable (Creswell, 2012:115) in Yanti (2017). This is the effect of independent variable. This variable was not manipulated by the researcher, but it was affected by the independent variable. The dependent variable of this research was the students' reading comprehension of narrative text achievement.

3.3 Population and Sample

3.3.1 Population

The population of this research was the first grade students of SMAN 1 Sumberejo, Tanggamus, Lampung. There were seven classes in first grade of SMAN 1 Sumberejo and 34-36 students for each class. The sample was one class as experimental class, which was selected by using Cluster Random Sampling.

3.3.2 Sample

The class was selected randomly by using lottery, since the first grade in SMAN 1 Sumberejo was not stratified class. There was no priority class. It was applied based on the consideration that every student in the population had the same chance to be chosen and in order to avoid the subjectivity in the research (Setiyadi, 2018). The experimental class had try out, pre-test, post-test, three treatments and questionnaire after the post-test.

3.4 Research Instrument

According to Sulistiyani (2014), research instrument is the tool of collecting data that should be valid and reliable. She adds that a research instrument can be valid if the instrument can measure what will be measured. There were two instruments of this study as follows:

3.4.1 Test

A test is a method to gain the data by giving some questions to the respondent (Sulistiyani, 2014). In this research the writer used achievement test, as Isnawati (2011:14) in Sulistiyani (2014): "Achievement test is test that is used to measure the process that students making after learning something". This test was used to measure the student achievement in reading comprehension before and after they are taught by using mind mapping technique in SMA N 1 Sumberejo.

In this study, the researcher applied pre-test and post-test. Pre-test was given before teaching by using mind mapping technique through *miMind* application. In this pre-test, students were given task during 60 minutes on January 13, 2021. Then, the researcher gave the first treatment to the students for 65 minutes on January 20, 2021. The next treatment were given on the second meeting during 65 minutes on January 27, 2021. The last treatment were given on the third meeting during 65 minutes on February 03, 2021. Post-test which were given after teaching by mind mapping on February 10, 2021, in this post-test the students were given task by using mind mapping technique during 60 minutes. After that, the questionnaire were also given to the students on the same day.

To get the data, the researcher as a teacher taught the students during five meetings in five weeks. At the first meeting, the teacher gave pre-test in reading comprehension of narrative text. At the second meeting, the teacher taught narrative text and manual mind mapping. At the third meeting, the teacher taught reading narrative text by using mind mapping technique through *miMind* application. At the fourth meeting, the teacher asked the students to construct a mind map through *miMind* application based on seven narrative text in a group. At the fifth meeting, the teacher gave post-test in reading comprehension of narrative text to the students.

3.4.2 Questionnaire

Questionnaire was conducted to obtain data or information about the students' response toward the technique by using android based mobile learning to answer the research question which

were given via google form. The questionnaire consists of 9 questions which have 5 numerical value: *sangat setuju, setuju, kurang setuju, tidak setuju,* and *sangat tidak setuju*; and also covered some aspects: the students' feelings toward the use of mind mapping technique, the effects of the mind mapping technique and the implementation of mind mapping technique to their knowledge improvement and reading skill, especially in narrative text. They were transcribed and summarized based on the classification quantitatively.

3.5 Research Procedure

In collecting the data, the researcher used the following steps:

1. *Selecting the instrument materials*: the instrument materials (reading test) were chosen from text book. The selecting process was based on the consideration of materials that have been taught to the students and the students' interest.

2. *Determining research instrument*: for both reading tests (pre-test and post-test), the materials were taken from internet. In the test, researcher used kind of narrative texts and in each text that was used consisted of 3 until 6 paragraphs. It was aimed at making an equal proportion and level of difficulty of both pre-test and post-test. The number of the items was arranged in such a way so that the reliability of the tests could be seen through split-half method.

3. *Determining the population and sample of the research*: the sample of the research was determined through cluster random sampling. It means that the sample was selected randomly by using lottery, since that the first grade of SMAN 1 Sumberejo was not stratified class, there was no priority class. There were seven classes of first grade at SMAN 1 Sumberejo. The class was chosen randomly by lottery.

4. *Administering the pre-test*: pre-test was conducted before the treatments. It was aimed to check students' reading ability in

determining mind idea, references, inference, finding detail information, and vocabulary in texts. Pre-test was administered for about 60 minutes on first week of the research.

5. *Giving treatment*: three treatments by using mind mapping were given in six weeks. The treatments were conducted in three meetings and 65 minutes for each. The treatments were online learning activity, that used WhatsApp, *miMind* Application, Google Classroom, and screen recording while learning mind mapping technique through *miMind* application in reading.

6. *Conducting post-test*: post-test was conducted after the treatment. Post-test was conducted to find out whether there was a significant students' reading ability after the treatments. It was administered for 60 minutes in experimental group.

7. *Distributing questionnaire.* The writer gave the students questionnaire to be answered. The questionnaire consisted of 9 items. Students were given 15 minutes to answer the questionnaire. The result of the questionnaire was used to know their response toward the technique by using android based mobile learning.

3.6 Try Out of The Instrument

Before conducting the research, the data collecting techniques were tried out in order to make sure whether the instruments are valid and reliable to collect the data.

3.6.1 Test

The try out of the test contained 40 items which consisted of five options in each. The type of the instruments was multiple choice tests and time allocation is 60 minutes. The try out test was conducted in experimental class since to make an equal proficiency with the sample of the research. The number of the students for the experimental class was 36 students.

3.6.2 Questionnaire

The try out of the questionnaire contained 9 questions which had 5 numerical value in each: *sangat setuju, setuju, kurang setuju, tidak setuju,* and *sangat tidak setuju*; and also covers two main aspects: the product results of mind mapping technique based android mobile learning, and the effectiveness of reading comprehension by using mind mapping technique based android mobile learning and to their knowledge improvement and reading skill, especially in narrative text. It was translated and answered into Indonesian in order to facilitate the learners in understanding the questionnaire. The time allocation for filling the questionnaire was 15 minutes. The try out questionnaire were conducted in experimental class since to make an equal proficiency with the sample of the research. The number of the students for the experimental class is 36 students.

3.7 Criteria of Good Test of Reading

In this research, to prove whether the test of reading has good quality, it must be tried out first. As Heaton (1991:5) in Patria (2015) stated that a reading test will be said has a good quality if it has good validity, reliability, and level difficulty and discrimination power. The questionnaire will also be called as a good test if it has good validity and reliability.

3.7.1 Validity

A test can be considered valid if the test can measure the object to be measured and suitable with the criteria (Hatch and Farhady, 1982:250) in Patria (2015). The discussion of the validity of questionnaire and reading test are provided below.

1. **Validity of the Questionnaire**

   According to the Hatch and Farhady (1982:281) in Patria (2015) there are two basic types of validity: content validity and

construct validity. The questionnaire used Thurstone Scales developed by Setiyadi (2018).

Table 3.1

Specification of Students' Response toward Mind Mapping by Using Android Mobile Learning in the Questionnaire

No.	Aspects	Indicators	Questions Number
1.	Aspects of product yield	Indicates the product results of mind mapping technique based android mobile learning	1, 2, 3, 4
2.	Aspects of effectiveness for students	Indicates the effectiveness of reading comprehension by using mind mapping technique based android mobile learning	5, 6, 7, 8, 9

2. Validity of the Reading Test

a. Content Validity

Content validity is concerned whether the test is sufficiently representative and comprehensive for the test. In the content validity, the material is given suitable with the curriculum. Content validity is the extent to which a test measures a representative sample of the subject meter content, the focus of content validity is adequacy of the sample and

simply on the appearance of the test (Hatch and Farhady, 1982:251) in Patria (2015).

The topic chosen was narrative text. The topics were the representative of reading materials of Curriculum 2013 Revised 2018 as a matter of tailoring the lesson to students' need. To know whether the test had a good content validity, the items of the test will be discussed with the expert (advisors), the researchers' colleague, and the English teacher of Senior High School. The composition of the test items is presented in table 3.2 below.

Table 3.2

Specification of Reading Test

No.	Reading Specification	Item Number	Percentage
1.	Determining main ideas	20, 21, 31	7.5%
2.	Inferences	3, 8, 11, 18, 26, 28, 29, 30, 36	22.5%
3	References	4, 12, 13, 22, 25, 27, 38	17.5%
4.	Finding detail information	1, 2, 6, 7, 10, 14, 15, 16, 19, 23, 24, 32, 34, 35, 37, 40	40%
5.	Vocabularies	5, 9, 17, 33, 39	12.5%
Total		40	100%

b. Construct Validity

It was concerning to whether the test is actually based on the theory of which it means to know the language that was being measured. In this research the researcher focused on reading comprehension in the form of narrative texts. Nuttal

(1985) in Patria (2015) stated that the relation validity of the instrument refers to construct validity in which the question represents five of sort reading skills, i.e. determining main idea, finding detail information, reference, inference and vocabulary mastery. Skills of reading in the test were a part of the construct validity and the item numbers were a part of the content validity.

The test was compared to the table of specification to know whether the test had a good reflection of what has been taught. A table of specification was an instrument that helped the test constructor planned the test.

3.7.2 Reliability

Reliability of the test can be defined as the extent to which a test produces consistent result when administrated under similar conditions (Hatch and Farhady, 1982:243) in Patria (2015). Split-half technique was used to estimate the reliability of the test and to measure the coefficient of the reliability between odd and even group, Pearson Product Moment formula was used as follows:

$$rl = \frac{\sum xy}{\sqrt{[\sum x^2][\sum y^2]}}$$

rl : Coefficient of reliability between odd and even numbers items.

x : Odd number.

y : Even number

x^2: Total score of odd number items

y^2: Total score of even number items

xy: Total number of odd and even numbers

(Lado, 1961 in Hughes, 1991:32) as cited in Patria (2015)

The criteria of reliability are:

- 0.80 – 1.00: high
- 0.50 – 0.79: moderate
- 0.00 – 0.49: low

(Hatch and Farhady, 1985:247) in Patria (2015)

To know the coefficient correlation of whole items, Spearmen Brown`s prophecy formula was used as follows:

$$rk = \frac{2r\mathrm{l}}{1 + r\mathrm{l}}$$

rk: The reliability of the test

r1: The reliability of the half test

(Hatch and Farhady, 1982:246) in Patria (2015)

3.7.3 Level of Difficulty

Level of difficulty relates to "how easy or difficult the item is in the form of the point of view of the students who took the test. It is important since test items which are too easy (that all students get right) can tell us nothing about differences within the test population" (Shohamy, 1985:79) in Patria (2015).

Level of difficulty was calculated by using the following formula:

$$\mathrm{LD} = \frac{\mathrm{R}}{\mathrm{N}}$$

LD = level difficulty

R = number of students who answers it right

N = total number of students

The criteria are:

LD < 0.30 = difficult

LD = 0.31- 0.70 = satisfied

LD > 0.71- 1.00 = easy

(Arikunto, 1997:214) in Patria (2015)

3.7.4 Discrimination Power of the Test

Discrimination power refers to "the extent to which the item differentiates between high and low level students on that test. A good item which is according to this criterion, is one in which good students did well, and bad students failed" (Shohamy, 1985:81) in Patria (2015).

The formula is:

$$\mathrm{DP} = \frac{\mathrm{Upper} - \mathrm{Lower}}{\frac{1}{2}(\mathrm{N})}$$

DP = discrimination power

Upper = proportion of "high group" students getting the item correct

Lower = proportion of "low group" students getting the item correct

N = total number of students

The criteria are follows:

LD = 0.00-0.20 = poor

LD = 0.21-0.40 = satisfactory

LD = 0.41-0.70 = good

LD = 0.71-1.00 = excellent

(Arikunto, 1997:223) in Patria (2015)

3.7.5 Scoring System

The researcher used Arikunto's formula in scoring the students' result of the test. The higher score was 100. The formula shown as follows.

$$S = \frac{R}{N} \times 100$$

Where:

S is the score of the test

R is the right answer

N is the total of the items

3.8 Data Analysis

The data of this study was statistically analyzed. The researcher used computer system called Statistical Package for Social Sciences (SPSS). To examine the result of questionnaire in analyzing the learners' response toward mind mapping technique through *miMind* application, the researcher analyzed its quantitative data, matrix analysis; in this case description analysis was used, since the researcher uses his own idea including his own interpretation toward the data (Setiyadi, 2018). *Repeated measures t-test* was also used to examine the data of learners' score in reading test.

In addition to test measurement, the researcher also applied the honesty test to the students when they took the test by using Auto Proctor Program on a Google Form containing tests for students to work on to minimize the form of students cheating referring to the fact that currently online learning are implemented due to the COVID-19 Pandemic. Auto Proctor Program itself is a program that uses artificial intelligence to prevent and gather evidence of malpractice during an online test (Auto Proctor, 2021). Furthermore, the program can give trust score that informs the teacher or the researcher of the overall test integrity by reporting audio, video, tab switching, etc. that can be tracked and stored. The program can be installed through google account.

V. CONCLUSION AND SUGGESTION

This chapter describes the conclusion and suggestion based on the result of this study.

5.1 Conclusions

Based on the result of analyzing the data, there was significant difference between the students' reading comprehension in narrative text before and after the implementation of mind mapping technique through *miMind* application at the first grade of SMA N 1 Sumberejo in academic year 2020/2021. It means there is an effectiveness of using mind mapping technique through *miMind* application on students' reading narrative text. It was due to the fact that the implementation of mind mapping technique through *miMind* application showed positive responses in experimental class by the increase of mean score and the number of students who received higher score. The fact showed that almost all students of the class received higher scores after being given the treatment. It means that the number of the students who received stabled scores after the treatment were less than the number of the students who received higher scores. Another fact showed that there were no students who received lower score after being given the treatment.

In addition to the significant difference between the students' reading comprehension in narrative text before and after the implementation of mind mapping technique through *miMind* application at the first grade of SMA N 1 Sumberejo in academic year 2020/2021, the questionnaire result showed that reading comprehension of narrative text by using mind mapping technique through *miMind* application gave positive impact for the students' learning. On the condition that the students have a deeper understanding about the concept of mind mapping technique through *miMind* application, so that the technique which

is modified by android based mobile learning can be implemented effectively on students' reading comprehension of narrative text.

From the effectiveness, it indicates that mind mapping as a visual diagram which is modified by the usage of *miMind* Application as android based mobile learning has sucessfully motivated the students to read narrative text in a joyful way. The students who get less interesting to learn something because they feel tired after full day class can minimize their boredom in comprehending a text by using *miMind* Application on their gadget. They can create an interesting map by using some colors and pictures which can be digitally organized anytime and anywhere. For this reason, mind mapping through *miMind* Application is one of the best answers that can help students in improving their reading comprehension of narrative text. Furthermore, considering to the readers in all grades like a joyful process in comprehending a text, therefore, mind mapping technique is not only limited to senior high school students, but it is also flexible to be implemented in all grades, such as elementary school students, junior high school students, even for college students, and in all subjects.

5.2 Suggestions

Based on the conclusion of the study, it can be delivered as a consideration, go to:

1. The students should be aware of the new learning technique that they can use to support their learning process, because one technique may works better than the others. In addition, every student definitely have one learning technique that suit them best.
2. The teachers should be careful in determining the term of implementing a technique to make sure that the students understand any of material explained by the teacher.
3. The other researchers can use this study as a relevant study related to the implementation of mind mapping technique through *miMind* application as android based mobile learning to improve students' reading comprehension of narrative text.

4. The school should better support the teacher in implementing a technique by giving proper time, place, and facilities for the success of knowledge transform from the teachers to the students.

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