THE EFFECT OF INTEGRATING JIGSAW WITHIN SA (SCIENTIFIC APPROACH) IN COMPARISON TO THE CONVENTIONAL SA IN TEACHING READING AT SMPN 4 PRINGSEWU

(A Thesis)

By
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MASTER IN ENGLISH LANGUAGE TEACHING STUDY PROGRAM
LANGUAGE AND ARTS EDUCATION DEPARTMENT
TEACHER TRAINING AND EDUCATION FACULTY
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ABSTRACT

THE EFFECTS OF INTEGRATING JIGSAW WITHIN SA (SCIENTIFIC APPROACH) IN COMPARISON TO THE CONVENTIONAL SA IN TEACHING READING AT SMPN 4 PRINGSEWU

By

Agatha Wuri Yayi Saputri

The objectives of the research are to find out whether there was a significant difference on students' reading comprehension achievement between those who were taught using integrated Jigsaw-SA and the conventional SA, to investigate which reading aspect was best practiced by the integration of these techniques, as well as how the implementation of integrated Jigsaw-SA in teaching reading was. To achieve the objectives of the research, the research was conducted quantitatively and qualitatively. It involved experimental and control classes. Students of the seventh grade of SMPN 4 Pringsewu were taken as the sample. The data were gathered through a reading comprehension test, observation, and interview.

The result of the data analysis showed that there was a significant difference of students' reading comprehension achievement of those who had the treatment of Jigsaw technique within SA and the conventional SA. The mean score of the experimental class was 75.93 while the control class was 67.73. The result of the independent sample t-test analysis showed that the t-value at the significant level of 0.05 and degree of freedom (df) 65 was 2.316. It was higher than the t-value listed in the t-table (2.000). The result of the data analysis also verifies that Jigsaw technique within SA promoted better comprehension in reading a text as it fostered students' achievement in all aspects of reading, especially in the aspect of identifying main idea, which resulted in better comprehension of the text. Despite all of the weaknesses of its implementation, it can be concluded that integrating Jigsaw technique within SA is an effective and fun way of fostering students' reading comprehension achievement as it also showed some strengths during its implementation. The integration of Jigsaw technique within SA has given more chances to the students to optimize their learning experiences.

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LEMBAR PERNYATAAN

Dengan ini saya menyatakan dengan sebenarnya bahwa:

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Bandar Lampung, 15 Januari 2018
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CURRICULUM VITAE

The writer is Agatha Wuri Yayi Saputri. She was born on August 14th, 1978 in Bandar Lampung. She is blessed to be the fourth child of Drs. M. Edi Yuwono and late Ch. Suratmi, and a wife to Yanuarius Yanu Dharmawan, S.S., M.Hum.

She started her formal education at SD Sejahtera I Kedaton in 1985 and graduated in 1991. Then, she continued her study at SMP Xaverius Tanjungkarang and graduated in 1994. She chose to enroll to general high school in Pringsewu and was registered as a student in SMU Xaverius Pringsewu. After graduating in 1997, she was accepted as a student of English Program of Teacher Training and Education Faculty of Lampung University.

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Then, in July 2014 she moved to SMPN 4 Pringsewu and has been teaching English there from then on. In 2015, she managed to get herself registered as a student of Master of English Education Program at Lampung University.

DEDICATION

By offering praise and greatest gratitude to Lord Jesus for His blessing, I would like to dedicate this piece of work to:

- My beloved partner in life, Yanuarius Yanu Dharmawan, S.S., M.Hum.
- My beloved parents, Drs. Martinus Edi Yuwono and late Christophora Suratmi
- My beloved siblings and the in laws, Anton & Elly, late Beni & late Ade, Alex & Yusti, Rika & Anton
- My fabulous friends of the third batch of Master of English Education Lampung University
- My almamater, Lampung University

MOTTO

- *From His abundance, we have all received one gracious blessing after another.*

(John 1:16)

- *Cherish every moment of life.*

(The writer)

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Last but not least, the writer welcomes any suggestions and constructive criticisms for the improvement of this thesis as she fully realizes that this thesis is not perfect and may have some weaknesses. Finally, the writer expects that this thesis would be beneficial to the development of education and those who are interested in the same field.

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CHAPTER I

INTRODUCTION

The first chapter describes background of the problem, formulation of the problems and research questions, research objectives, research uses, the scope of the research and definition of key terms.

1.1 Background of the Problem

Indonesian government has paid serious attention to the improvement of education field. This can be inferred from the curriculum that has been developed several times. The government continues to undertake various reforms in education to improve the quality of education. In the course of history since Indonesian Independence (1945), the national curriculum of Indonesia has undergone several changes, namely in 1947, 1952, 1964, 1968, 1975, 1984, 1994, 2004, curriculum of KTSP 2006 (best known as School Based Curriculum), and the latest is curriculum 2013. Even the latest curriculum itself is still going through several revisions due to several criticisms from public during its implementation progress.

Curriculum does not occur in isolation. As Schubert (1986) states that curriculum is socially, politically and culturally constructed. It is obvious that those revisions are logically consequences of political issue, government system, social cultural, economic, science and technology change in the living of state community. Further, he also states that curriculum improvement is serious and inescapable. Thus, the presence of the factors surround curriculum must be taken into account in its creation and implementation.

The implementation of curriculum 2013 is done gradually since 2013. In the academic year of 2013/2014, the curriculum was implemented for grades I, IV, VII, and X in some piloting schools (schools which are chosen to implement the curriculum). In the academic year of 2014/2015, the curriculum was implemented for grades I, II, IV, V, VII, VIII, X, and XI. In the academic year of 2015/2016, all grades of I to XII of the piloting schools have implemented the curriculum 2013. The effort of improving curriculum is done for the purpose of developing the quality of national education system and producing qualified students with greater emphasis on building students' characters, developing relevant skills based on students' interests and needs, and developing a thematic learning approach that benefits students' cognitive abilities that enable them to compete locally, nationally and globally as described in the Republic of Indonesia Act No 20/2003 about National Education System. Moreover, Indonesian Ministry of Education clarifies that the implementation of curriculum 2013 is a strategic step to face the global demands. The market has demanded employees (graduates) with the ability to solve problems. McCain, Rice and Wilson, Lunenberg, cited in Castronova,

2010), state the need of graduates with the ability to acquire, interpret, and evaluate data to learn, reason and solve problem. Thus, schools must not isolate themselves from changes.

Richards (2013) defines the term curriculum as an overall plan or design for a course and how the content for a course is transformed into a blueprint for teaching and learning which enables the desired learning outcomes to be achieved. While Finocchiaro, cited in Muth'im (2014, p.1095), defines curriculum as "the knowledge, information, skills, activities, materials, etc. which are included in the teaching of any subject". Indonesian government refers curriculum to a set of planning and organization of aim, content, and learning material as the guidance to learning activity to achieve a particular educational objective (Republic of Indonesia Act, No.20 /2003). The growth of social, political and cultural life on Indonesia has brought the newest curriculum which is expected to counter the global challenges. The latest curriculum implemented in Indonesian National Education System is the 2013 curriculum with all of its characteristics to prepare graduates to have scientific mind set.

This curriculum among other things is intended to empower teachers to facilitate learners in developing their competency independently. Teachers are facilitators to help learners to develop their competency through scientific principles. The curriculum requires the learners to be active or to be the center of the learning process. Another major characteristic of the curriculum is the provision of implementing scientific models of learning, namely Scientific Approach, Problem

Based learning, Project Based learning, and Discovery learning. These learning models are required to be implemented in learning process of all subjects including language learning.

The Scientific Approach (SA) as one of the suggested models of learning in curriculum 2013 proposes a scientific learning procedure namely observing, questioning, collecting data, associating, and communicating. Decree of Education and Cultural Ministry number 103/2014 provides the guidance to implement the learning model. The procedure of implementing SA states that learner are required to be involved in the stages of observing, questioning, collecting information, associating, and communicating. Learners observe subject matter with their senses by watching, reading, and/or listening. Then learners are expected to raise their curiosity on the subject matter that they have observed. The next step requires learners to actively collect new information on the subject matter. After that, learners are guided to analyze the new information they have got, draw conclusion and internalize it into their knowledge. Finally, learners are given chance to communicate their new knowledge and skill.

Through these series stages of SA, learners are trained to construct their own knowledge. They are trained to have high order thinking skills. The stages proposed by SA in the 2013 curriculum are actually reflection of the principles of Constructivism, in which the steps are designed in order for the learners to construct their knowledge through interaction. As Resnick, cited in Richardson (2003), defines constructivism as learning or meaning making that individuals

create their own new understanding on the basis of interaction between what they already know and believe and ideas and knowledge with which they come into contact. While Hoover, cited in Mvududu & Burgess (2012), states two important notions of constructed knowledge. The first is that learners construct new understanding using what they have already known. The second one is learners remain active throughout the process of learning. Moreover, Piaget and Inhelder, cited in Mvududu & Burgess (2012), believe that the fundamental of learning is discovery. Discovery learning encourages learners to build on past experiences and knowledge, use their intuition, imagination and creativity, and search for new information to discover facts, correlations and new truths. Learning does not equal absorbing what was said or read, but actively seeking for answer and solutions. In addition, Vygotsky, cited in Yang and Wilson (2006), claims that learning occurs through dialogue. The dialogue refers to the interaction with source of ideas or knowledge. Thus, the notions of constructivism are definitely what scientific approach tries to achieve.

The term “scientific” is of course commonly used in the science field while in language learning, it is something new. It certainly becomes dilemma for English as Foreign Language teachers. Effectiveness on how this approach can be successfully implemented in language learning is questionable as language is not an exact subject. Several researches had been conducted related to this concern. Suharyadi (2014: 1349) in his essays stated that this approach is not clear yet and probably it causes some controversies for English teachers. Whether SA is appropriate for teaching a foreign language, teachers should be aware in

implementing SA in teaching English to reach the goal of teaching and learning English in the classroom. Further, Amalia and Hartono (2015) emphasize that there is an urgent need to investigate SA because of the confusion in implementing the new curriculum launched by Ministry of Education and Culture in 2013. Both researches came to the findings that SA can be implemented in language learning with combination of Genre Based Approach (GBA). Moreover, Sarosa (2014) reveals that many English teachers got troubled in understanding and implementing the concept of SA into their classroom activities. He also stresses that they were lack of information on SA in English learning process. In accordance to Sarosa's finding, Jaedun et al. (2014) came to a conclusion that English teachers were not ready to implement the required learning models suggested by curriculum 2013. In contrast to Indonesian researchers' findings on SA procedure, which obviously developed on constructivism learning theory, Taber (2011) claims that constructivism is applicable for teaching at all levels and in all disciplines when teachers pay more attention on the instructions.

Therefore, the researcher assumes that SA can be well applied in language learning as well. The researcher is interested in integrating Jigsaw technique within SA as it is the learning model suggested by the latest curriculum. SA requires learners to have experience in group work learning and Jigsaw provides learning activities that oblige learners not only to work in group but to cooperate well. A lot of researches on Jigsaw technique have been conducted. They were Meng (2010), Mengduo and Xiaolig (2010), and Adhami and Marzban (2014).

The findings of the previous researches have shown the effectiveness of Jigsaw in teaching reading especially in college and intermediate high school level. However, learners on primary level are also important to get more attention on the development of their reading comprehension. Treatments should be applied to facilitate learners on primary level to deal with reading materials as well. Thus the researcher is interested in implementing Jigsaw technique to teach reading to junior high school level which will be integrated into SA.

1.2 Research Questions

Referring to the background of the problem, the formulation of the problems in this research is formulated in the following research questions:

1. Is there any significant difference between students' reading comprehension achievement after being taught through the integration of Jigsaw technique within SA and the conventional SA?
2. What aspect of reading will be best practiced through the integration of Jigsaw technique within SA?
3. How is the implementation of integrating Jigsaw technique within SA for teaching reading?

1.3 Objectives of the Research

The objectives of this research are to see whether the integration of Jigsaw technique within SA accommodates significant difference in students' reading comprehension achievement in comparison to the conventional SA. Further, it

also tries to find out the aspect of reading best practiced and describe how the integrated Jigsaw-SA technique is implemented in teaching reading.

1.4 The Scope of the Research

The research was conducted in the seventh grade class of junior high school students in which English is a new compulsory subject for them. The research dealt with classroom interaction in SMPN 4 Pringsewu. SMPN 4 Pringsewu is one of the piloting schools of the implementation of curriculum 2013, thus it has implemented the curriculum for almost 5 years. The researcher designed a classroom interaction, in which she integrated Jigsaw technique within SA. The scores of students' achievement on their reading comprehension test were taken as the data. The data were also gained from observation and interview with the students to describe their experience in learning through the integration of Jigsaw technique within SA.

1.5 The Uses of the Research

This research is hopefully useful both theoretically and practically;

1. Theoretically

   To see whether the result of this research is relevant or not to the previous theories.

2. Practically

   - For the teacher to broaden teachers' understanding about Scientific Approach and Jigsaw technique in language learning.
   - As a reference for further research dealing with the topic.

1.6 Definition of Key Terms

Definition of terms aims at avoiding misunderstanding about the terms in the research. The terms are:

1. Curriculum 2013

   Curriculum 2013 is the latest curriculum applied in Indonesia. The curriculum required learner-centered learning activities. One of the characteristics of this curriculum is the requirement to undergo scientific model of learning in the learning activities. The curriculum emphasizes the learning process to cover the aspects of students' attitude, knowledge and skills.

2. Scientific Approach

   Scientific Approach is a learning model that requires scientific procedure to be implemented in classroom learning activity in the 2013 Indonesian Curriculum, that is a series of steps namely observing, questioning, collecting data, associating, and communicating.

3. Jigsaw Technique

   Jigsaw is a cooperative technique. This technique was developed by Aronson in 1978. In a Jigsaw technique, students work in pairs or small groups. They each have different information. Learners will be a master of a small piece of different information related to the learning material. Then, they will have to exchange their information so that everyone will have all the information/material learnt.

4. Reading

   Reading is a receptive skill. It is the process of gaining information of a written text. The process of comprehending a text involves physical and mental activities. It requires readers to relate the information in the text to their knowledge and surrounding. Thus, reading is an active skill as well.

To sum up, this chapter elaborates the reasons why the writer is interested in investigating the effectiveness of implementing Jigsaw technique within SA in teaching reading. The limitation of the problems is presented as well as the scope and the terms related to the research.

CHAPTER II

FRAME OF THEORIES

The second chapter delineates theories which are relevant with the research. The discussion of the chapter concerns with the previous related studies, the nature of reading, the concept of teaching reading, definitions of curriculum, curriculum 2013, scientific approach, constructivism, and Jigsaw technique. The model of integrating Jigsaw technique within Scientific Approach will be described as well.

2.1 Previous Studies Related to the Topic

Language learning should bring the learners to the communicative competence as the ultimate goal of learning process. Some linguists have proposed the nature of learning. Approaches have been developed for the purpose of maximizing learning outcomes. Behaviorists believe that the result of learning is formed through habit or drilling. Cognitivists propose the approach to learn best by communicating with surrounding. Constructivists argue to provide discovering process as a modern way of learning in correlation with globalization demands.

The latest model of learning that is adapted in Indonesian curriculum uses the underlying concept of constructing learners' knowledge is the Scientific Approach (SA).

Several studies dealing with curriculum 2013 implementation in English Language Teaching (ELT) and SA implementation in language learning have been done by some researchers. Dealing with curriculum 2013 implementation, the first was Sahirudin (2013). He investigated the obstacles in implementing curriculum 2013 in ELT class. He concluded that the obstacles came from policy makers, teachers and learners as well. Then Muth'im (2014) delineates the essence of curriculum 2013 and claims that the implementation of the new curriculum should be a challenge for English teacher to improve their knowledge, creativity and skills in teaching. Further, Ahmad (2014) found out that the constraints of implementing curriculum 2013 in ELT lies in the teachers' mindset that refuse the change in curriculum. In line with Ahmad's research, Nur and Madkur (2014) described teachers' perspectives on the implementation of curriculum 2013 and concluded that English Foreign language (EFL) teachers are the key factors of the successfulness of the implementation of curriculum 2013. Meanwhile, Sarosa (2014) observed the possibility of implementing Communicative Language Teaching (CLT) in curriculum 2013 ELT classroom. He argues that CLT can be an alternative to achieve the learning objective by considering the principles and creating innovative cooperative activity.

Several researches on SA have also been conducted. First, Atmazaki (2013) concluded that SA would be effective as the students became the centre of the activities. He also stated that the implementation of Genre Based Approach (GBA) would be appropriate in the classroom activities which are designed with SA. It is shown by the materials that are arranged based on text types. Then, Suharyadi (2013) explored the implementation of Scientific Approach in GBA. He concluded that SA is a series of steps that cannot replace language learning approach. It is because language is not an exact science while the term "scientific" closely related to exact or natural science. Moreover, Amalia and Hartono (2015) analyzed the integration of GBA in the steps proposed by SA. They came to the conclusion that GBA was well integrated in SA steps. They described that the steps of GBA could be implemented in the procedure of SA. Meanwhile, Kartikawati (2015) and Wahyudin and Sukyadi (2015) found a similar finding in their researches dealing with the implementation of SA steps in EFL classroom interaction. They found out that during the implementation, it was difficult to implement all the stages suggested by the curriculum.

The previous studies emphasized on how GBA and CLT were integrated in SA and the obstacles of implementing the required standardized learning process. However, they had not investigated how cooperative learning as the latest development of teaching approach might be integrated in SA fundamental theories. Therefore, the researcher would like to investigate the implementation of SA with the integration of Jigsaw technique as one of the cooperative model of learning that accommodates the learning process as required by the law.

Some researches on Jigsaw technique implementation had been conducted. In 2010, Meng claimed that Jigsaw is one of the most effective ways of teaching English reading. Moreover, Mengduo and Xiaolig (2010) had implemented this technique to integrate the four skills of language and concluded that it is an effective way to promote students' participation and enthusiasm as well as a useful technique for language learners to learn in the EFL classroom. Al-Salkhi (2015) described the effectiveness of Jigsaw technique on learners' achievement and learning motivation. Likewise, Adhami and Marzban (2014) stated that Jigsaw task is effective to be implemented on reading for EFL learners.

Some researchers have also investigated the effectiveness of Jigsaw technique in promoting students' achievements related to the aspects of reading. Firstly, Turi (2013) implemented this technique to teach reading at senior high school and concluded that it promotes improvement on the aspect of identifying specific information best. Then in 2016, Yunita compared the use of Jigsaw technique and Know, Want to know, Learned (KWL) technique. She concluded that Jigsaw promotes all the aspects of reading better than KWL technique. She identified that the aspect of vocabulary was best promoted. Recently, Novita (2016) investigated the effectiveness of Jigsaw technique by integrating it with video recording technique. She found out that the integration of this technique promoted best improvement in the aspect of identifying main idea.

Those researches had been conducted to college and intermediate level learners. Thus, the researcher is interested in implementing this technique to early level learners that is the seventh grade students of junior high school.

2.2 The Nature of Reading

Reading as one of the four language skills is a receptive one. It means that by reading someone is gaining or comprehending information. Nuttall (1994, p.4) describes reading as the process of getting a message from a text. This is the ability to interpret what the information or meaning developed in printed materials. As reading has the aim of understanding, Widdowson (cited in Liu, 2010) defines reading as the process of getting linguistic information via print.

Though reading is a receptive skill, it is far from being passive as in fact it is an active process. While reading, readers relate information in the text to what they already know. Knowledge about the world around them helps them comprehend the meaning of the words or sentences. Alderson (cited in Liu, 2010) states that readers are also thinking about what they are reading: what it means to them, how it relates to other things they have read, to things they know, and to what they expect to come next in the text.

To sum up, reading is an active process that involves physical and mental process as well. The physical process involves the recognition of symbols or printed materials through the eyes. While the mental process involves the process of relating the information to what the readers already know to come to

understanding. Hunt (cited in Hermida, 2009) defines it as a process shaped partly by the text, partly by the reader's background, and partly by the situation the reading occurs in.

2.3 The Concept of Teaching Reading

Teaching a foreign language means to teach the four skills of speaking, listening, reading, and writing. The purpose of teaching reading is to study on the particular printed material and to comprehend the message the writer tried to communicate. However, since 1970's, teaching reading has got more attention and been emphasized on how the students deal with unfamiliar texts on their own in order to achieve full comprehension. Nutall (cited in Yazar, 2013) claims that the general aim of teaching reading is to facilitate students to read without help any unfamiliar authentic texts.

Teaching reading will be related to the activities of reading itself. Cahyono and Widianti (2006) elaborate the activities of reading lesson into three phases of pre-reading, during-reading, and post-reading. Further, Yazar (2013) enlightens the reading activities in reading lesson. Pre-Reading activities are done to introduce and arouse interest in the topic, motivate learners by giving a reason for reading, and provide some language preparation for the text. During/while-reading activities are aimed to help understanding of the writer's purpose, to help understanding of the text structure, and to clarify text content. And the last phase is done to strengthen or reflect upon what has been read and to relate the text to the learners' own knowledge, interests, or views.

Teaching reading will also related to teaching the aspects of reading that students must be familiar with. They are main idea, specific information, reference, inference, and vocabulary. Milan (cited in Kuning, 2015) states that students should master five reading skills. They are identifying main idea, identifying details, making references, making inferences, and understanding vocabulary. This is in line with King and Stanley (cited in Riani et al., 2014) who affirm that there are five components in reading texts that may help the students in understanding a text. They are finding factual information, finding main idea, finding the meaning vocabulary in the context, identifying reference, and making inference. All of the aspects should be mastered in reading comprehension skills are described as follows:

1. Main idea is the idea that becomes the core of the whole paragraph. It is the most important idea stated in the topic sentence and supported by supporting sentences in a single paragraph (Suparman, 2012)
2. Specific information or supporting idea is the ideas which develop the main idea by giving the specific definitions that is related to the topic sentence. This is in line with Suparman (2012) who states that supporting details is the sentences or statements which develop the main idea by giving reasons, examples, facts, statistics, and quotations.
3. Reference is delineated as words which are used before or after certain information to avoid unnecessary repetition of words or phrases. They are used to be a signal to the reader to find the meaning elsewhere in the text. Louis and Pereira (2010) describe references as words that connect ideas.

They refer the readers to other parts of the text. Therefore, in order to identify reference students should know the intended thing pointed by the writer.

4. Inference is the conclusion that readers make after reading the text. Nation (2008) describes making inference as taking messages from the text that are not explicitly stated.
5. Vocabulary is the fundamental stock of words that one has in order to communicate well. Nation (2008) affirms that word recognition during reading is affected by vocabulary knowledge; similarly vocabulary knowledge will be affected by word recognition.

To summarize, in designing reading lessons a teacher must take into account the purpose of teaching reading. The aspects of reading must also be reflected on the activities so that reading will result in students' comprehension of the text independently. Lastly, the activities should be organized in pre, while, and post reading activities.

2.4 Curriculum

Curriculum is the whole plan of learning that must be followed by learners in a certain period of time. Pratt and Barrow and Milburn (cited in Su, 2012) state that the word "curriculum" is derived from the Latin verb currere, "to run." "Currere" became a diminutive noun and meant a "racing chariot" or "race track." In accordance, Susilo (cited in Khasanah, 2015) states that in the past, curriculum is defined as a period of education that must be taken by students to obtain a diploma as a runner who had to take a distance of race to reach the finish line.

For those reasons, a curriculum is required as mounts to students in achieving the learning objectives.

Furthermore, the curriculum can also be used as a consideration in some respects. Schubert (1986) deliberates curriculum as a consideration of perspectives, paradigms, and possibilities. Perspectives are the basic development of beliefs or assumptions on curriculum. Paradigms are the conceptual or framework through which problems are perceived. And possibilities will provide the responses for the needs or answers for the problems.

The definition of curriculum according to the Indonesian government is a set of planning and organization of aim, content, and learning material as the guidance to learning activity to achieve a particular educational objective (Republic of Indonesia Act No.20 /2003). Further, it describes two dimensions of curriculum. The first one is planning and organizing the purpose, content, and materials. And the second one is the way how to implement it in the learning process.

Of all the theories about the curriculum mentioned above, we can conclude that an objective does require a means of transportation. Curriculum as the main tool is expected to make a goal of learning to be more in accordance with the characteristics of human beings who live in it. For it Curriculum 2013 was introduced.

2.5 Curriculum 2013

Curriculum 2013 was raised in 2013 as its name suggests. When it was introduced to the public, there were many pros and cons. This is because something new might change completely a thing that has been done before. But actually the new curriculum is simply to adjust to a current circumstance that is to emphasize the improvement of the student's character.

Decree of Education and Cultural Ministry number 58/2014 states that the characteristics of curriculum 2013 are as follows:

1. Developing a balance among the spiritual and social attitudes, knowledge, and skills, and applying them in various situations in schools and communities;
2. Placing schools as a part of the society that provide learning experiences which allow learners to apply what they have learned in schools to the society and take the society as a learning resource;
3. Providing enough time to develop the attitudes, knowledge, and skills;
4. Developing competencies in class core competencies which are elaborated more detail in the subject's basic competencies;
5. Developing the class core competencies as elements of organizing basic competencies. All the basic competencies and learning processes are developed to achieve the competencies stated in the core competencies;
6. Developing basic competencies based on the principles of accumulative, mutually reinforcement and enrichment among-subjects and educational levels (horizontal and vertical organizations)

Curriculum 2013 aims to prepare the 2013 Indonesian human resources to have the ability to live as individuals and citizens who are able to have faith in God, be productive, creative, innovative, and capable of contributing to the society, nation, state, and world civilization.

Moreover, Ministry of Education and Culture (2015) elaborates some revisions dealing to the implementation of curriculum 2013 as follows:

1. Strengthening learning pattern which centered on the learners. Learners must have choices on the materials studied and their learning styles to achieve the same competencies
2. Strengthening interactive learning (interaction among teachers-learners-society-environment, source / other medias);
3. Strengthening networking learning (for learners to gain knowledge from anyone and anywhere that can be contacted and obtained via the internet);
4. Strengthening active discovery learning (student active learning is reinforced by scientific learning approach);
5. Strengthening individual and group learning patterns (team-based);
6. Strengthening multimedia-based learning;
7. Strengthening classical based learning with regard to the development of special characteristics of every learner;
8. Strengthening multidiscipline learning; and
9. Strengthening critical learning.

After these revisions take into effect, something that is to be seen more is an appropriate approach that should be used. As this is scientific based learning, the

scientific models of learning come forward as provision in the implementation of curriculum 2013. One of them is the Scientific Approach.

2.6 Scientific Approach (SA)

Indonesia government has suggested the use scientific based learning in all subjects in the curriculum of 2013 (Decree of Education and Cultural Ministry number 103/2014). One of the scientific models of learning suggested by the curriculum is SA; the curriculum suggests teaching that covers learners' aspects of attitude, knowledge and skills. It is claimed to be an effective way of learning as it apply series of scientific procedure. The procedure will facilitate learners to have creative and critical way of thinking, communicative and collaborative skills as well.

As a guidance to implement scientific based learning, the government has described the principle of learning and procedure of SA in the Decree of Education and Cultural Ministry number 103/2014.

The principles of learning are as follow:

1. Learners are facilitated to discover;
2. Learners learn from vary learning resources;
3. The process of learning implements scientific approach;
4. Competency-based learning;
5. Integrated learning;
6. Learning that emphasizes the divergent answers that have a multi-dimensional truth;

7. Applicative skills-based learning;
8. Development of balance, sustainability and linkage between hard-skills and soft skills;
9. Learning that promotes habit and empowers learners to be lifelong learners;
10. Learning that applies the values by giving exemplary (Ing Ngarso Sung Tulodo), encouraging willingness (Ing Madyo Mangun Karso), and developing the creativity of the learners in the learning process (Tut Wuri Handayani);
11. Learning that takes place at home, school, and in the society;
12. The use of information and communication technologies to improve the efficiency and effectiveness of learning;
13. The recognition of learners individual differences and cultural backgrounds; and
14. Fun and challenging learning environment

The government also claims that the objectives of implementing SA will facilitate learners to develop their ability to be critical, collaborative, communicative, and creative (Kemdikbud, 2016). These skills are believed to be the characteristics of 21st century skills. These principles of learning and the objectives of implementing SA must be considered critically to be revealed within SA. Here are the steps of SA.

1. Observing

   In this step, students are provided with objects, real objects, or phenomena. They observe with their senses (read, hear, listen, watch, etc) with or without medias.

2. Questioning

   The second step is questioning. Students are expected to make and ask questions, discuss about the information they have not known, asking for additional information, or asking for clarification.

3. Collecting information/Experimenting

   The third step requires students to explore the world around them, try, demonstrate, imitate, do experiment, read different resources, and collect information from different sources. The step is intended to develop various learning objectives, the attitudes, skills, and knowledge

4. Associating

   This step leads the students to work on the information they have gathered, analyze, categorize, associate, and relate them to the related phenomenon/information in order to find pattern and draw conclusion.

5. Communicating/Networking

   In this step, learners collaborate with their peers. They present report in forms of chart, diagram, or table. Students are also required to make written report and present it orally.

The procedure hopefully can help teachers facilitate students to acquire the objectives of the curriculum that is to facilitate learners to discover and construct

new knowledge. Therefore the concept of constructivism is needed to be elaborated.

2.7 Constructivism

Some theorists pertain to some definitions of constructivism. They are Piaget (1970s), Vygotsky (1970s), Taber (2011), and Richardson (2003). The theories support one to another. Taber (2011) states that constructivism as educational theories comprises of ideas about how human learning occurs, and the factors that tend to channel learning. Further, he also states that constructivist's view suggest learning process happens by which human come to experience their surrounding and interpreted them. Thus, individual has to actively construct a meaningful interpretation of what being seen or heard.

Previously, Piaget's theory of cognitive development stages (cited in Taber, 2011) delineates that human's way of thinking grows more scientific as they grow older. This leads to the keys of constructivist principles for teacher, they are: teaching involves activating relevant ideas already available to learners to help construct knowledge and students will built their new knowledge upon partial, incorrect, or apparently irrelevant exiting knowledge unless carefully guided. Moreover, Vygotsky (cited in Taber, 2011) focuses on how each individual concept has to construct their own concepts which are modified by interactions with others. Thus, constructivism believes that individuals construct their own knowledge during the course of interaction with the environment. Thinking is an active process where people organize their perception. It can be

inferred that constructivism as a learning theory suggests that effective teaching learning need to be both student-centered and teacher-directed.

Recently, Bhattacharjee (2015) defines constructivism as a philosophy of learning founded on the premise that, by reflecting on ones experiences, they will construct their own understanding of the world they live in. Further, he also describes Wilson and Cole' concepts which are considered as central to the constructivist instructional design. They are:

1. Learning is embedded in a rich authentic problem-solving environment;
2. Authentic versus academic contexts for learning are provided;
3. Provisions for learner control are incorporated;
4. Errors are used as a mechanism to provide feedback on learners' understanding; and
5. Learning is embedded in social experience.

Moreover, Richardson (2003) states that constructivist pedagogy process involves the following characteristics:

1. Attention to the individual and respect for students' background and developing understanding of and beliefs about elements of the domain (this could be described as student-centered)
2. Facilitation of group dialogue that explores an element of the domain with the purpose of leading to the creation and shared understanding of a topic.

3. Planned and often unplanned introduction of formal domain knowledge into the conversation through direct instruction, reference to text, exploration of a web site, or some other means.
4. Provision of opportunities for students to determine, challenge, change or add existing beliefs an understanding through engagement in task that are structured for this purposed.
5. Development of students' meta-awareness of their own understandings and learning processes.

Additionally, principles of constructivist in foreign language teaching are described by Wolff (cited in Aljohani, 2017). He outlines the features of foreign language teaching on constructivist lines as follows:

1. It is based on action-orientedness and cooperative learning, creative forms of classroom work, learning by projects, and, LBT (learning by teaching) are essential in the constructivism classroom.
2. More concentration on the learner-centeredness which means more individualization of learning, and autonomy of learner.
3. Process-related awareness is essential in the constructivist classroom and learning awareness, language awareness, and intercultural awareness.
4. Holistic language experience is the soul of this theory in the language classes, which depends on content-orientedness, authentic and complex learning environment.

In summary, constructivism views learners as an individual that capable of develop their own knowledge. They use their prior knowledge to interact with

their surroundings. The interaction will facilitate learners to construct new knowledge. Learners will actively construct their own knowledge. This process of constructing knowledge will be facilitated through one of teaching techniques known as Jigsaw Technique.

2.8 Jigsaw Technique

The Jigsaw technique was originally developed by Elliot Aronson in 1970s in Austin, Texas. Aronson (cited in Irawan, 2014) enlightens that the idea behind Jigsaw technique is just like Jigsaw puzzle. Each piece (it refers to the students) of a puzzle is important for the completion and understanding of the final product. Then, every student plays their important role in achieving the final goal of a learning process.

Jigsaw technique is under the principle of cooperative learning method. Related to cooperative learning, T. Roger and Johnson (2002) argue that cooperative learning efforts may be expected to be more productive when they meet the following conditions:

1. Clearly perceived positive interdependence
2. Considerable promotive (face-to-face) interaction
3. Clearly perceived individual accountability and personal responsibility to achieve the group's goals
4. Frequent use of the relevant interpersonal and small-group skills
5. Frequent and regular group processing of current functioning to improve the group's future effectiveness.

Further, Mengduo and Xiaoling (2010) describe Jigsaw as a group learning activity where each member of a group is assigned a different part of material. Then all the students from different groups who have the same learning material gather together and form an "expert group" to discuss and communicate with each other until they all master the material. Later, the students will return back to their home group to teach the material to other members of their group.

To implement Jigsaw technique, several principles must be taken into account. Johnson, Johnson and Holubec, cited in Dyna (2013), state that there are five principles of Jigsaw strategy. They are:

1. Positive interdependence. Each student should do some effort for the group success by making unique contribution to the joint effort.
2. Face to face promotive interaction. Each group members should explain orally how to master the material or solve the problem, teaching the others, check other member understands, discuss concept and link the present leaning with the past one.
3. Individual accountability for the group achievement. The size of the group should be small because small group enhance greater individual accountability. Later the teacher should test the students randomly by asking one of the students to present their group orally.
4. Interpersonal skills. Social skill is an important part in achieving the success of Jigsaw leaning in class. This social skill includes decision making, leadership, trust building, communication, and conflict management.

5. Group processing. Each group should discuss how well they achieve in their goals and maintain effective working relationship. Besides, they should discuss what actions are helpful and what behavior needs to continue or change

Those principles support what Aronson (2016) elaborates on the steps of implementing Jigsaw technique in classroom activity. He describes the steps as follows:

1. Students are divided into 5 to 6 persons in a Jigsaw group. These groups should diverse in ability, race, gender and ethnicity.
2. The teacher appoints one student in each group to be the group leader. These leaders should be the most matter student in the group.
3. The material is divided into 5 - 6 segments and distributed for each member of the group.
4. Each student ought to study their own part of material
5. The teacher gives time for students to read and understand the part of the material given.
6. Next is forming the groups in which the students should gather to those who have the same material. Each group will be the “expert group”. In this group the students have to discuss the main point of the material, solve the problem and rehearse the presentation they are going to make.
7. Students return to their home/Jigsaw group and teach their peers in their Jigsaw group.
8. Each student presents their part. Other members are encouraged to ask questions for clarification.

9. The teacher floats from group to group in order to observe the process. Teacher may intervene if the students find difficulties. If there is a student in the group that dominates the discussion, it is the role of the leader to handle it. The teacher can whisper to the group leaders until the group leaders can handle it themselves.
10. Finally, the teacher gives a quiz on the material so that the student can learn something instead of thinking that it is only for fun and games.

Another theory related to the stages of implementing Jigsaw technique is mentioned by Albaghdadi, et al. (cited in Al-Salkhi, 2015). They propose the design of Jigsaw model in three main stages namely planning, implementing, and evaluating stages.

A) Planning stage:

1. Purpose identification: the main purpose of Jigsaw strategy is to acquire the organized knowledge through specialty groups. Also, the necessary behavioral objectives of each study subject need to be identified.
2. Designing study material: the teacher is responsible for preparing the study material and tools such as textbooks, references, articles, video tapes, drawings, etc.
3. Grouping the students according to their interests, previous experience, and achievement level. However, the group should be heterogeneous to enable low performers learn from high performers.
4. Designing evaluation tools: the teacher should prepare a test in view of the identified behavioral objectives that cover all study subjects

B) Implementing Jigsaw stage

C) Evaluating stage

The stages described above are actually a brief summary on Aronson's details on Jigsaw technique.

The principles and elaborations of Jigsaw technique are carried out by Mengduo and Xiaoling (2010) with their conclusion on the advantages of applying the technique. They state some benefits of using Jigsaw technique. They believe that Jigsaw technique brings about the following advantages:

1. Learners are eager to participate in the learning process and are responsible for the work and achievement while being held accountable by their peers; students have more chance to appreciate differences and share experiences through individual participation and instruction ;
2. The Jigsaw classroom stimulates students' motivation and increases enjoyment of the learning experience and promotes a great deal of negotiation for meaning;
3. The Jigsaw classroom reduces students' reluctance and anxiety to participate in the classroom activities while increasing self-esteem and self-confidence;
4. Finally, Jigsaw is an effective strategy to integrate various language skills and translation in one English class with the teacher no longer the sole provider of knowledge.

Referring to the advantages elaborated above, it is obvious that Jigsaw technique might well facilitate learners to achieve what the curriculum 2013 has required. Thus, integrating it into SA will expectedly support what the curriculum expects to achieve as the result of the learning process.

Aside from the advantages of implementing Jigsaw in the classroom, the disadvantages of its implementation must also come into account. Tewksbury (cited in Novita, 2016) elaborates the disadvantages of Jigsaw implementation as follow:

1. It takes much time to organize the group.
2. If students do not get into their group quickly enough or read their initial texts quickly enough, it will run out of time.
3. If one or two students do not participate, a whole group will lose out on a piece of text.
4. The class situation becomes noisy.
5. A teacher cannot monitor all groups at once.
6. It only depends on students' information that basically have the same level of proficiency.

2.9 Jigsaw Technique within Scientific Approach

Jigsaw technique provides learning experiences through cooperation and peer teaching in groups, while SA facilitates learning through the steps of observing, questioning, collecting information, associating, and communicating. Both SA and Jigsaw train students to discover and solve problems within groups.

However, Jigsaw raises students' accountability and responsibility. The integration of Jigsaw technique within SA is shown in the table below.

Table 2.1 The Integration of Jigsaw Technique within Scientific Approach

Scientific Approach	Jigsaw Technique	Jigsaw Technique within SA
- Observing - Questioning - Collecting Information - Associating - Communicating	- Students are divided into 5 to 6 persons in a Jigsaw group - The teacher appoints one student in each group to be the group leader - The material is divided into 5 - 6 segments and distributed for each member of the group - Each student ought to study their own part of material - The teacher gives time for students to read and understand the part of the material given - Forming the expert groups in which the students should gather to those who have the same material - Students return to their home/Jigsaw group and	**Pre-Reading** - Topics are introduced - Jigsaw groups are formed - Chief of each group is appointed. - Within the Jigsaw groups, each chief leads the discussion to decide who will be responsible for certain topic described by the teacher earlier. **While-Reading** *Observing* - Expert groups are formed and chief of each group is appointed. - Chiefs of the group get instruction on how to lead the group to meet the targeted learning objectives - Reading materials are assigned to the group to be observed and discussed - Each group will have different piece of material. (descriptions of person, animal, object, and place) - Each group member will observe/read the reading material

	teach their peers in their Jigsaw group - Each student presents their part - The teacher floats from group to group in order to observe the process - The teacher gives a quiz on the material	*Questioning* - Each group member is given chance to initiate their questions/opinions related to the material they observe/read.
		Collecting Information - Each member of the expert groups will make notes on important information found in the text such as the main idea, the pronoun, details and new vocabulary
		Associating - Students' worksheet is assigned to each expert group. - Each expert group will solve the problems presented in the worksheet. - Each member of expert group must be ensured that they can deliver the material and problems they have solved well when they are back in their Jigsaw groups.
		Communicating - The members of expert group return to their Jigsaw group. - Every Jigsaw member has a chance to report the result of their expert group discussion and give explanation to any comment or questions related to his/her topic. Thus, they communicate

		their knowledge. - Every group member works together to solve the problems in the last worksheet assigned by the teacher which contains all of the materials discussed in the expert groups. Thus, they will make a network to work together in order to complete each other's knowledge.
		Post-Reading - Teacher leads the student to conclude the material. - Teacher gives the students chance to discuss their problems during the learning process.

In Pre-Reading Activities, topic of discussion is introduced. Then, Jigsaw groups are formed. Students are grouped by using numbers. Each student will have a number ranges from 1 to 8. The students with the same number will be in the same Jigsaw group. Each group will consist of 4 – 5 students. Next, chief of each group is appointed and instructed on how to lead the group. The chief leads the discussion to decide who will be responsible for certain topics described by the teacher earlier that is descriptions of person, animal, object, and place.

In While-Reading Activities, all of the SA steps take place and the students will start working in their expert groups.

Observing will be the first step. In this step, expert groups are formed. There will be 4 expert groups based on the topics of the material. Chiefs of the group will get instruction on how to lead the group to meet the targeted learning objectives. Then, reading materials are assigned to the group to be read. Each group will have different piece of material. The reading materials will be constructed with some coding such as colored, bolded, italicized, and underlined words in order to trigger students' curiosity. Thus, while they are observing the material they will also be lured to question about the text they are reading.

Then, the students will come to the *Questioning* step. The principle of giving the students opportunity to discuss and deliver questions or ideas on what they have observed is accommodated in this step.

Next is *the collecting information* step. In this step each member of the expert groups will practice to read/pronounce, make notes on important information found in the text such as the main idea, the pronoun, details and new vocabulary. This step facilitates the principle of collecting information in which they gather new information by making records on the new information they have discussed.

In *the associating* step, a worksheet will be assigned to each expert group. The worksheets will be different for each group based on their topics of discussion. Each expert group will work together to solve the problems presented in the worksheet. The problems will deal with reading aspects that is identifying main idea, supporting details, reference, inference, and using vocabulary in context. Each member of expert group must be ensured that they can deliver the material

and problems they have solved well as when they are back in their Jigsaw groups, they will have to take turn to elaborate their understanding to their peers. These activities will implement the principle of associating knowledge in which the students can work on the information they have gathered previously, use them to solve the problems assigned and draw conclusion.

The last step in SA is the *Communicating/ Networking*. In this step, the members of expert group will return to their Jigsaw group. They will have a chance to report the result of their discussion in their expert groups and give explanation to any comments or questions related to his/her topic. Everyone will have a chance to communicate the information they have. They will take turn to elaborate their understanding to their peers then they will work together to solve all the problems assigned to their group. Thus, each Jigsaw group will have all the topics assigned in the expert groups. They will complement each other. This is done as the implementation of communicating and networking principle. This activity is aimed to ensure that each group member collaborates with their peers in order to comprehend the topics well.

In Post-Reading Activities, the teacher will lead the student to conclude the materials have been learnt and also discuss the problems that they possibly have during the learning process.

2.10 Theoretical Assumption

Scientific Approach is the new learning model implemented in the latest curriculum in Indonesia that is curriculum 2013. This model of learning is implemented in all subjects including English learning. A series of scientific learning procedure namely observing, questioning, collecting information/experimenting, associating, and communicating are suggested in this model. Each step is designed with the objective of creating students with creative and critical way of thinking, as well as communicative and collaborative skills by actively involved in finding and constructing new knowledge.

Constructivism describes the development of cognitive knowledge individually and socially. Learners have the ability to gain their knowledge by themselves and through interaction among them. Further, constructivism learning promotes learners to the effectiveness of learning by discovering or finding out the new knowledge by themselves. Through this method, learners will be driven to learn actively. The activity will involve the development of learners' attitude through their interaction with their surrounding and models that are shown by the teachers. They will develop their cognitive as they construct their knowledge. And they will also improve their skill as they have experiences in using their knowledge in practices.

Cooperative learning that is developed by the principles of constructivism has brought about several learning techniques, which one of them is the Jigsaw technique. Several researchers have proven that this technique is effective to

enhance students' achievement in English. Specifically in reading skill, some researchers have enlightened that Jigsaw technique can promote students' reading achievement in the aspect of identifying main idea and vocabulary use.

Due to the previous theories and researches, it is important to investigate further the effectiveness of integrating Jigsaw technique into Scientific Approach implementation in facilitating students' development in their reading comprehension achievement. Through qualitative analysis, it can describe genuine classroom interactions among students. Teacher's guidance and students activities in the classroom can also be analyzed to know how the students act in response to the teacher's guidance or instruction. Quantitatively, the research can reflect the effectiveness of integrating Jigsaw technique into SA implementation to accommodate learner to develop their reading comprehension achievement.

In short, by conducting this research, the researcher assumes that the implementation of integrating Jigsaw technique within SA will bring significant difference in the students' reading comprehension achievement in comparison to the conventional SA and certain aspect of reading will be best practiced by the integration of these techniques that will result in the highest achievement of one of the aspects of reading. The researcher also presumes that Jigsaw can be well integrated within SA to help the teacher facilitate the students to achieve best in their reading comprehension.

2.11 Hypotheses

Based on the theories and the assumptions above, the researcher proposed the hypotheses as follows:

H_{01} : There is no significant difference between the students' reading comprehension achievement after being taught through the integration of Jigsaw technique within SA and the conventional SA.

H_{A1} : There is a significant difference between the students' reading comprehension achievement after being taught through the integration of Jigsaw technique within SA and the conventional SA.

H_{02} : There is no difference in the percentage scores of each aspect of reading achievement.

H_{A2} : The percentage score of an aspect of reading achievement is the highest among the others.

In summary, this chapter asserts the supporting theories related to the issues brought forward by the researcher. The alternatives of possible findings are presented as well.

CHAPTER III

RESEARCH METHOD

This chapter describes research design, variables, population and sample, setting, data collecting techniques, validity and reliability, procedures, and hypothesis testing of the research.

3.1 Research Design

The study was intended to find out if there would be a significant difference in students' reading comprehension achievement through the implementation of Jigsaw technique which was integrated within SA or not. It also investigated the aspects of reading that was best promoted through the integration of these techniques. Further, it also tried to reveal how its implementation in reading class might affect students' reading comprehension. To answer the objectives of the study, both quantitative and qualitative methods were applied.

The research used static-group comparison design. The design of the research was as follows:

K1 X1 T

K2 X2 T

(Setiyadi, 2006)

K1 was the experimental group which had the treatment of integrated Jigsaw within SA (X1). K2 was the control group. This group got the regular treatment that was SA (X2). As the design of the research was pre-experimental, both groups were chosen with some criteria to match the objectives of the research. After both groups got the treatment, they had the same test (T). The data gathered were analyzed by using independent sample t-test.

3.2 Variables of the Research

Conducting a research will involve the presence of variables. Variables can be classified into independent and dependent. Kaur (2013) defines independent variable as an active variable that manipulates the values of another variable. Moreover, he also defines dependent variable as the variable that is affected by the independent variable.

There were two variables engaged in the research. They were independent and dependent variables. The independent variables were the integration on Jigsaw technique within SA and the regular SA. The dependent variable was the students' reading comprehension achievement.

3.3 Population and Sample of the Research

The Population of the research was the seventh grade students of SMPN 4 Pringsewu. There were seven classes of grade seven at SMPN 4 Pringsewu. Two out of seven classes were chosen as the sample. As the research was a pre-experimental one, the samples were chosen to match several purposes. The researcher used purposive sampling in order to represent the objectives of the research (Setiyadi, 2006). Students of 7^{th} grade was chosen as the subject of the research since the research was intended to investigate whether the implementation of Jigsaw technique within SA would give positive effect to early learners of English achievement in reading comprehension or not.

Some criteria were also taken into account in choosing the samples to ensure that they were at equal basic ability and that the progress made by the students was really the effect of the treatment given. The researcher took two classes of grade seventh that had nearly the same average report score (Appendix 2). They were class 7.1 (the average score of knowledge aspect was 80.30 and skill aspect was 80.61) and class 7.2 (the average score of knowledge aspect was 80.03 and skill aspect was 80.44). To ensure further that the judgment given to the students were of the same standard, the samples were taken from the classes which were taught by the same teacher in which her judgment of the condition of the two classes was also the consideration of choosing the classes.

3.4 Research Setting

The research was conducted in SMPN 4 Pringsewu. It was considered to be the place where the research conducted since it has been implementing curriculum 2013 for almost 5 years. The researcher designed an English classroom learning activities for the seventh graders which integrate Jigsaw technique into SA. The researcher took the data from students' reading comprehension test scores, observation during the learning activities and interview after the learning activities.

3.5 Data Collecting Techniques

The data needed to answer the research questions of the research was collected through some techniques, thus it needed some instruments as well. To answer the first and second research questions, a test was administered. Further, observation and interview were conducted to answer the third research question. The instruments needed in the research were a reading test, observation sheet, and interview guidance.

3.5.1 Reading Test

The reading test was administered to find out the difference of students' reading comprehension achievement of those who were taught through the integration of Jigsaw technique within SA and those who were taught through conventional SA. The test consisted of items that measured students' achievement in reading aspects.

3.5.2 Observation

Observation is commonly carried out in a qualitative research to investigate natural phenomenon on the research subjects. The researcher's role was as an observer of the interaction; she observed and took notes on the natural phenomenon occurred during the learning activities. Field notes or observation sheets were used to record important points during the classroom interaction.

The observation sheet was constructed based on the procedure of Scientific Approach suggested in the Decree of education and cultural ministry number 103/2013 as well as the objectives of implementing SA. The indicators were specified as follows:

Table 3.1 Indicators for Observation Sheet

No	SA steps	Activities	Indicators
1	Observing	Students are provided with objects, real objects, or phenomena. They observe with their senses (read, hear, listen, watch, etc) with or without medias.	- Students listen or read carefully
2	Questioning	Students are expected to make and ask questions, discuss about the information they have not known, asking for additional information, or asking for clarification	- Students deliver questions - Students deliver ideas - Students ask for clarification

3	Collecting Information	Students are expected to explore the world around them, try, demonstrate, imitate, do experiment, read different resources, and collect information from different sources.	- Students try to pronounce the new words - Students try to read the sentences in the text - Students make note
4	Associating	Students work on the information they have gathered, analyze, categorize, associate, and relate them to the related phenomenon/information in order to find pattern and draw conclusion	- Students do the task - Students discuss the problem to be solved - Students have ideas on how to do the task - Students make conclusion
5	Communicating / Networking	Students collaborate with their peers	- Students communicate well in delivering their presentation - Students respond to their peer's presentation

3.5.3 Interview

The researcher also interviewed the students to gather more reliable data. In this case she took the chiefs of each group of the experimental and control classes to be the interviewees as they were the ones who controlled the activities within his/her group. Thus, they were the one who noticed well how his/her group members participated in each group activities.

The interview was a semi structured one in which some guidance questions were provided yet further questions developed in the field were possible. The questions were constructed referring to the indicators specified based on the procedure of Scientific Approach suggested in the Decree of education and cultural ministry number 103/2013 and the objectives of implementing SA. The indicators were specified into the following guidance questions

Table 3.2 Indicators for Guidance Questions

No	SA Steps	Indicators	Guidance Questions
1	Observing	- Students listen or read carefully	- Did everyone read the text carefully?
2	Questioning	- Students deliver questions - Students deliver ideas - Students ask for clarification	- Did anyone ask anything about the text? - Did anyone try to answer the questions arise in the group? - Did anyone ask for clarification on the information?
3	Collecting Information	- Students try to pronounce the new words - Students try to read the sentences in the text - Students make note	- Did everyone actively seek for information? - Did everyone mention or read any words or sentences? - Did everyone make notes?
4	Associating	- Students do the task - Students discuss the problem to be solved	- Did everyone involve in doing the task? - Did anyone have ideas on

		- Students have ideas on how to do the task - Students make conclusion	how to finish the task? - Did everyone cooperate well to finish the task? - Did anyone try to make conclusion?
5	Communicating / Networking	- Students communicate well in delivering their presentation - Students respond to their peer's presentation	- Did everyone communicate well in delivering their information? - Did anyone communicate their agreement or disagreement on their peers' work?

3.6 Validity and Reliability

To gain relevant data for both quantitative and qualitative research, validity and reliability of the instrument must be ensured. Cohen et al. (2007) describes validity as refers to a demonstration that a particular instrument in fact measures what is purports to measure. Meanwhile, reliability is described as consistency over time and over similar samples.

3.6.1 Validity and Reliability of the Reading Test

The validity and reliability of the reading test that was used as the instrument in this research to collect the quantitative data was measured. The validity of the reading test items was measured by inter-raters. The raters judged the content and

construct validity of the items. The reliability of the items was measured by SPPS version 23.

3.6.1.1 Validity of the Reading Test

Validity refers to the preciseness of an instrument in measuring what is supposed to measure. The content and construct validity of the test were measured. Content validity refers to the extent to which the test items represent the materials should be measured (Setiyadi, 2006). While construct validity refers to the extent to which the items represent particular constructs or concepts (Cohen et al., 2007). To make sure that the reading test had content and construct validity, the researcher used inter-rater to analyze the items.

Some experienced teachers were asked to be raters to analyze the validity of the test items. They were Damiana Sri Murwani, S.Pd (English teacher of SMPN 2 Adiluwih, Pringsewu) as the first rater, Andy Mukriadi, S.Pd, M.Pd (Supervisor of English teacher in Pringsewu Regency) as the second rater, and Prapti Yuono, S.Pd (English teacher of SMPN 3 Gadingrejo, Pringsewu) as the third rater. The researcher chose those raters with the criteria of certified teachers and they had passed the 2016 teachers' competency test. Thus, she considered them as qualified raters to assess the validity of the reading test items.

Dealing with the content validity, the raters were asked to judge whether or not the test items had represented the materials based on the materials stated in the

lesson plan and suggested by the curriculum that is the Basic Competence 4.7.1. The criteria are presented in the table below.

Table 3.3 Basic Competence 4.7.1

Basic Competence	Indicators
4.7.1 Understanding the social function, text structure, and language aspects of spoken and written short and simple descriptive text related to people, animals, objects, and places contextually.	1. Written texts. 2. Descriptive texts 3. Short texts 4. Simple texts 5. The topics presented are about : a. People b. Animal c. Object d. Place

The result of the inter-rater analysis on the content validity (Appendix 4) shows that all of the raters agreed that the items had represented the content suggested by the curriculum that is short simple written descriptive texts on people, animal, object, and place in students' surrounding. Therefore, it can be concluded that the items had the content validity.

Dealing with the construct validity, the raters were asked to judge whether or not the items had represent the underlining theory of aspects of reading. The table of specification of the reading test is as follows:

Table 3.4 Reading Test Table of Specification

NO	INDICATORS	ITEMS NUMBER
1	Identifying main idea	1, 10, 14, 23, 32, 37
2	Identifying supporting details	3, 6, 9, 12, 15, 16, 17, 19, 20, 24, 26, 28, 29, 33, 34, 35, 39
3	Identifying reference	8, 13, 22, 31
4	Making inference	2, 4, 11, 21, 25, 38
5	Understanding vocabulary	5, 7, 18, 27, 30, 36, 40

The result of the inter-rater analysis on the construct validity (Appendix 4) shows that the raters agreed on 95% of the items that is 38 out of 40 items were constructed based on the appropriate reading aspects that should be measured while the other 5% that is 2 out of 40 were not. The items were item number 2 and 38. Raters I and III (66.7%) agreed that the items were measuring the aspect of making inference, while rater II determined them as measuring the aspect of identifying supporting details.

However, as 2 out of 3 or 66.7% of the raters had the same opinion on items number 2 and 38, it can be taken into account that the items matched the aspect that should be measured that is making inference. Thus, as a whole the reading test can be concluded to have construct validity.

3.6.1.2 Reliability of the Reading Test

Try out test was conducted to measure the reliability of the test as well as its difficulty level and discrimination power. It was held on April 17th, 2017. The researcher chose two classes of the eighth grade of SMPN 4 Pringsewu, they were

class 8.1 and 8.2. There were 34 students in class 8.1 and 34 in class 8.2. However, on the day of the try out test, four students of class 8.1 and seven students of class 8.2 were representing the school in some regional competitions, thus there were 57 students of class 8.1 and 8.2 joined the try out test.

The two classes were chosen with some criteria to ensure the researcher that these two classes would be able to represent the ability of the experimental and control classes after they got the treatments. The researcher considered their English class daily learning situation by asking for the opinion of the teacher who taught them at the seventh grade who is also the teacher of the seventh graders of the ongoing academic year. To support the teacher's suggestion, the researcher also compared their report grades as the consideration (Appendix 2). The average English scores of class 8.1, when they were in grade 7 in the first semester were 79.84 (aspect of knowledge) and 80.88 (aspect of skill) while class 8.2's score were 79.47 (aspect of knowledge) and 80.12 (aspect of skill).

The number of the items test were 40 that consisted of identifying main idea (15%), supporting details (45%), reference (10%), inference (13%) and vocabulary (17%). Every item of the test had four options of answer (A, B, C, and D). The time allocated for the test was 80 minutes.

3.6.1.2.1 Reliability of the Test Items

To measure the reliability of the reading test, the researcher used split-half technique which was computed by using SPSS version 23 program. The reliability

coefficient of the test should be at least 0.70 or higher. If the reliability coefficient of the test is 0.70 or higher, it means that the reading test is reliable and useable. The criteria of reliability for split-half coefficient are:

... > 0.90 : very highly reliable

0.80 – 0.90 : highly reliable

0.70 – 0.79 : reliable

0.60 – 0.69 : minimally reliable

... < 0.60 : unacceptably low reliability

(Cohen et al., 2007: 506)

The result of the computation showed that the reliability coefficient of the test was 0.890 (Appendix 5). Referring to the criteria presented by Cohen et al. (2007), the reading test instrument belonged to the category of having high reliability, therefore it can be concluded that the test instrument was reliable and applicable. Further, after the experimental and control classes had taken the test, the results of the test were analyzed to see the test instrument reliability. The result of the computation of the reliability coefficient was 0.847 (Appendix 5). It means that the test instrument belonged to the category of highly reliable. Thus, it was affirmed that the reading test was also reliable when it was used to take the data.

3.6.1.2.2 Difficulty Level of the Test Items

The Level of difficulty deals with how well the students can do the test items. It shows how easy or difficult each item is for the examinees. Level of difficulty is a chance to correctly answer a certain item in certain level of ability which is

usually presented in form of index (Depdiknas, 2008). The index ranges from 0.00 to 1.00.

The formula to calculate Level of Difficulty is as follows:

$$LD = \frac{A}{N}$$

LD : level of difficulty

A : the number of students who answered the items correctly

N : the total number of students who attempted the item

(Cohen et al., 2007: 423)

Classification of difficulty level

0.00 – 0.30 : difficult

0.31 – 0.70 : average

0.71 – 1.00 : easy

(Depdiknas, 2008:12)

After the result of the try out test was analyzed (Appendix 6), it can be seen that 40% of the item was easy, 47% was average and 13% was difficult. The easy items were number 3, 9, 10, 11, 12, 18, 19, 23, 24, 26, 28, 32, 33, 34, 38, and 39 in which the index ranged from 0.72 – 0.96. The average items which the index ranged from 0.37 – 0.70 were number 1, 2, 4, 5, 6, 7, 8, 13, 15, 16, 17, 21, 25, 29, 30, 31, 36, 37, and 40 . The items number 14, 20, 22, 27, and 35 were classified into difficult items as their difficulty level index ranged from 0.11 – 0.30.

3.6.1.2.3 Discrimination Power of the Test Items

Discrimination power refers to how well an item can differentiate between high and low level students. Cohen et al. (2007) describes discrimination power as the potential of the item test to be answered correctly by qualified students and incorrectly by less qualified students. Thus, an item test with good discrimination power will be able to distinguish between students with high and low ability.

Classification of discrimination power

... $\leq$ 2.00 : poor

0.21 – 0.40 : satisfactory

0.41 – 0.70 : good

0.71 – 1.00 : excellent

(Arikunto, 2013:232)

The discrimination power of each test item was determined after analyzing the result of the try out test (Appendix 6). The result showed that 4 items were excellent as their discrimination power value was above 0.71. They were items number 1, 8, 21, and 40. Further, 14 items were classified into good. Their discrimination power value ranged between 0.41 – 0.70. The items were number 2, 4, 5, 10, 13, 14, 15, 16, 17, 25, 27, 30, 31, and 37. The items number 3, 6, 7, 9, 12, 20, 22, 23, 24, 26, 29, 32, 33, 35, 36, 38, and 39 were classified into satisfactory. 5 out of 40 items were classified into poor as their discrimination power values were below 2.00. The items were number 11, 18, 19, 34, and 38.

3.6.2 Validity and Reliability of the Qualitative Data

The research employed qualitative research as well to answer the third research question. Validity and reliability in a qualitative research refers to the data collected. Validity refers to the authenticity of the data (Setiyadi, 2006). Thus, to ensure the validity of the data, the researcher ensured that the phenomena occurring during the classroom interaction were natural. The researcher had joined the classroom activities several times before undergoing the treatment so that the students got accustomed to her presence.

Reliability of the data refers to the consistency of the data. The researcher used triangulation to see the consistency of the data collected. Setiyadi (2006) describes triangulation as the use of two or more methods to collect data. Cohen and Manion (cited in Setiyadi, 2006) propose 5 types of triangulation. They are time triangulation, space triangulation, theoretical triangulation, methodological triangulation, and investigator triangulation. To ensure the reliability of the data in her research, the researcher used methodological triangulation. She employed two methods of collecting the data that was observation and interview.

3.7 Research Procedures

The research was conducted by following the procedure as follows:

1. Determining the research problem

   The first step of the research was determining the research problem. The researcher determined the problems that were likely to be the case of discussion.

2. Determining the population and selecting the sample

   The population of the research was the seventh grade students of SMPN 4 Pringsewu. The samples were chosen by purposive sampling. Two out of the seven classes were chosen as the control and experimental groups.

3. Arranging the material that will be taught

   The researcher arranged the material to be taught in the class by preparing the lesson plans for both experimental and control groups.

4. Administering validity and reliability test

   The researcher had the reading test items assessed by raters to ensure the validity of the test. Then, try out was conducted to measure the reliability of the test.

5. Implementing treatment and observing

   The researcher applied the integration of Jigsaw technique with SA in the experimental group while observing the interaction during the learning activities as well. The control group got the treatment of regular SA in learning the same material. Each group had three meetings to undergo a series of SA procedure.

6. Administering test

   The researcher administered the test after giving treatment to both experimental and control groups. The test was administered to measure students' reading comprehension achievement after getting different treatments.

7. Administering interview

   The researcher interviewed some students to strengthen the data that she had gathered from the observation.

8. Analyzing the data

   The researcher analyzed the quantitative data by using SPSS version 23 while for the qualitative data, the researcher used typological analysis.

9. Writing the report

   The researcher reported the result of the data analysis both the quantitative and qualitative ones. Conclusions were drawn as well as the suggestions based on the result of the research.

3.8 Data Analysis

The data collected in the research were analyzed quantitatively and qualitatively. The quantitative data gained from the reading test were analyzed by using Statistical Package for Social Sciences (SPSS) version 23 and the result was used to test the hypotheses proposed. The qualitative data, gathered from the observation and interview, were analyzed typologically. The steps of the data analysis are described as follows.

a. First Research Question

To answer the first research question, the researcher analyzed the data by following these steps:

1. The researcher scored the students' reading comprehension test of both experimental and control classes.

2. The researcher tabulated students' scores and classified them into upper, medium, and lower groups.
3. The researcher tabulated the mean scores of the students' reading comprehension test into SPSS version 23 and analyzed them using *Independent Samples T-Test*.
4. Based on the results of the analysis, the researcher drew a conclusion whether the difference in the students' reading comprehension test achievement scores of the experimental and control classes is significant.

b. Second Research Question

The researcher analyzed the data by following the steps below to answer the second research question:

1. The researcher grouped the test items of each reading aspects.
2. The researcher tabulated the correct and wrong answers of the students' answers into SPSS version 23 and analyzed them to see the frequency of the correct answers of each reading aspect.
3. The researcher tabulated the percentage of the correct answer of each test item from experimental and control classes into a table and compared them to see the difference.
4. The researcher compared the difference of each aspect of reading and identified the highest percentage among them.

c. Third Research Question

The following steps were taken in order to answer the third research question:

1. The researcher grouped the result of the observation based on the same participations and activities that the students showed during the learning process.
2. The researcher transcribed the interview recordings.
3. The researcher grouped the students' similar answers.
4. The researcher identified the patterns of the students' actions and participations in the learning activities of each experimental and control class.
5. The researcher compared the result of the observation and the interview.
6. The researcher drew conclusions based on the regular patterns that appeared.

3.8.1 Hypotheses Testing

The researcher tested the hypotheses of the first research question through independent sample t-test by using SPSS version 23 and the hypotheses of the second research question by comparing students' percentage scores of each reading aspect achievement. The hypotheses are as follows:

Hypotheses of the first research question

H_{01} : There is no significant difference between the students' reading comprehension achievement after being taught through the integration of Jigsaw technique within SA and conventional SA.

H_{A1} : There is a significant difference between the students' reading comprehension achievement after being taught through the integration of Jigsaw technique within SA and conventional SA.

Independent sample t-test was used to analyze the data. And significant level of 0.05 was employed to test the hypotheses of the first research question. These are the criteria to find out which hypothesis of the first research question is accepted.

- H_{01} will be accepted if the two-tailed significant (p) value is greater than 0.05 and the t-value is less the t-table at the significant level of 0.05
- H_{A1} will be accepted if the two-tailed significant (p) value is less than 0.05 and the t-value is greater than t-table at the significant level of 0.05

Hypotheses of the second research question

H_{02} : There is no difference in the percentage scores of each aspect of reading achievement.

H_{A2} : The percentage score of an aspect of reading achievement is the highest among the others.

For the hypotheses related to the second research question, the percentage scores of the correct answers gained by the students were used to test the hypotheses. These are the criteria to find out which hypothesis of the second research question is accepted.

- H_{02} will be accepted if the percentage scores of identifying main idea, identifying supporting details, identifying reference, making inference, and identifying vocabulary are the same.
- H_{A2} will be accepted if the percentage score of one of the aspects of reading is the highest among the others.

3.8.2 Typological Analysis

The data gathered from the observation and the interview were analyzed using typological analysis. They were put into groups or categories on the basis criteria of participations and activities which were based on the procedure of SA implementation. Then, conclusions of the data analysis were drawn based on the regular patterns that appeared.

CHAPTER V
CONCLUSIONS AND SUGGESTIONS

This chapter enlightens the conclusions drawn as well as suggestions related to the results and findings of the research.

5.1 Conclusions

Considering the results and discussions of the implementation of integrating Jigsaw technique within SA for teaching reading, the researcher draws the following conclusions:

1. Integrating Jigsaw technique within SA is an effective and fun way of teaching reading in junior level of EFL class. It is a fruitful strategy to assist students to achieve better in reading comprehension.
2. Integrating Jigsaw technique within SA provides learning activities which are supportive to guide students to practice their skills in discovering information in all aspects of reading, especially the aspect of identifying main idea.
3. Jigsaw can be well implemented within SA for teaching reading. It optimizes the achievement of not only language learning goal but also curriculum 2013 goals that is to develop students' 21st century skills as the students are more facilitated to be more creative, critical, communicative and collaborative during the whole process of learning.

5.2 Suggestions

The following are some suggestions for those who are interested in the integration of Jigsaw technique within SA with regard to the results and findings of the research.

5.2.1 Suggestions for English Teachers

It is suggested for English teachers to:

1. Apply the Jigsaw technique within SA to teach reading in junior level of EFL class as this integrated Jigsaw-SA technique is an effective and enjoyable way of learning to promote students' reading comprehension achievement.
2. Apply some strict rules in order to avoid too much unnecessary noise during the learning process because this integrated Jigsaw-SA technique consents to a lot of discussions.
3. Play the role as a facilitator carefully to ensure that at the end of the learning process, all students get the same knowledge on what have been learnt since they have mostly learnt from their peers who have limited proficiency and different ability in communicating and sharing information.

5.2.2 Suggestions for Other Researchers

By considering the limitations of this research, researchers who are interested in the same field are suggested to:

1. Conduct a study on the use of integrating Jigsaw technique within SA to improve the other language skills since this study only focused on the reading skill.

2. Investigate the possibilities of reading aspects that might be least facilitated and identify the factors that possibly hinder them for this research focused more on the aspect of reading best practiced through the integration of Jigsaw technique within SA.
3. Explore the effectiveness of Jigsaw technique within SA for outdoor learning activities as this research was conducted in classroom which has a limited space for changing group activities.
4. Use a collaborator to serve as an observer so that the researcher can accomodate the groups' activities better since in this study the researcher played the role as the teacher and the observer.
5. Conduct a pre-test to ensure the homogeneity of the experimental and control classes as this research assumed the homogeneity of the samples merely based on the English teacher's perception and the students' report scores.
6. Develop more complex and interesting reading materials as this study used very short and simple descriptive texts.

In brief, the conclusions of this research and the suggestions for English teachers who are interested to implement Jigsaw technique within SA and other researchers who want to conduct any relevant researches have been explained in this chapter.

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