The effect of Scientific Approach in teaching reading comprehension

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ABSTRACT

The purpose of study is to examine whether significant differences exist in students' pre-test and post-test reading comprehension as a result of experiencing instruction using scientific approach, to examine whether significant differences in students' test scores exist between those attending scientific approach and those experiencing conventional instruction, and to elaborate how students perceive the scientific approach, particularly in reading comprehension at the twelfth students grade in SMAN 1 Wawonii. The data were obtained from students' pre-test and post-test scores, SEEQ questionnaire, and open-ended questions. The finding revealed that significant differences exist in students' pre-test and post-test reading comprehension as a result of experiencing instruction using scientific approach, $p (.000) < 0.05$. The finding also indicated that significant differences in students' test scores exist between those attending scientific approach and those experiencing conventional instruction $p (.000) < 0.05$. Furthermore, the finding also showed that majority of students agreed that the scientific approach was effective to increase their reading comprehension.

1. INTRODUCTION

By and large, reading is one of the four necessary language skills for those learning English as a second or foreign language (ESL/EFL). Reading is an essential skill that should be mastered by students. However, to master or to have a good reading skill, the students are not only able to read but also they should construct the meaning from the text, which is called comprehension in reading. To comprehend the

reading, the students need strategies to guide them in the process. If readers can read the words but do not understand the meaning, they are not reading. Being able to understand a printed passage is an important academic task and forms the basis for learning in academic subjects (Pressley, 2002). Hence, students should have good reading skills to help them in academic studies.

Nevertheless, comprehending the text is one of the problems that students face in reading. They cannot focus on what they read during the reading activity and still have difficulty to get the ideas of the text. Answering the reading comprehension test will be time-consuming if they use inappropriate strategies. Another problem is that not every detail of information in the passage is needed to answer the reading questions, but students usually read the reading passage word by word (Zaim, 2016). Reading a text word by word also makes them quickly forget what they have read. Therefore, it is fundamental to apply the most appropriate teaching approach in solving these problems, and a scientific approach is considered convenient as a recommended teaching approach.

The scientific approach is paramount to improve the quality of teaching and learning. It directs students to develop and integrate their attitudes, skills, and knowledge (Suharyadi, 2013). The scientific approach in teaching-learning is oriented to develop the student's ability to solve the problem by using integrated inquiry activities that demand to have the critical thinking and creativity to increase students' understanding. The approach can encourage students to be capable of observing, questioning, experimenting, associating, and communicating (Abidin, 2014). Since the scientific approach is reliable for serving as an effective teaching approach, its potential to be integrated into teaching reading comprehension is noteworthy and effective. The following section provides a literature review relating to the scientific approach as a teaching approach in reading comprehension.

2. LITERATURE REVIEW

2.1. Scientific Approach in Curriculum 2013

To support the scientific approach in the 2013 curriculum, teachers have the responsibility to be proactive in planning the lesson and designing an active learning experience that involves the scientific method. The integration of scientific methods in science learning requires teachers to approach science teaching like science, in which practices and conclusions are based on objective data rather than conventional instruction (Wieman & Gilbert, 2015). In other words, a scientific approach to teaching sets out teachers to facilitate students generating, testing, accepting, or rejecting scientific statements and theories; therefore, students actively construct their knowledge.

Several scholars have defined scientific approaches; for instance, Alfred (1989) the scientific approach is a learning model of scientific thinking, the development of science of inquiry, and students' thinking ability (as cited in Majid, 2014, p. 3). A scientific approach is the approach that applies the scientist's steps in building new knowledge through scientific methods. The learning model needed is a model that enables students to think scientifically and creatively and also develop a sense of inquiry (Shofwan, 2017). A scientific approach is an approach of teaching that is designed with the same rigor as science at its best; learners make observations,

develop hypotheses about phenomena, devise tests to investigate their hypotheses, and communicate their findings to others. With this nature, scholars believe that the scientific approach as a teaching method could encourage learners to be curious toward science, to improve their oral communication and critical thinking (Fauziati, 2014).

A scientific approach allows teachers or curriculum developers to improve the learning process, namely by breaking the process down into steps or stages in detail, which contain any instructions for the students to carry out any learning activities (Varelas & Ford, 2009). The required learning model is the one allowing the culture of scientific thinking skills, development of a sense of inquiry, and creative thinking abilities of learners. Meanwhile, theoretically, learning with a scientific approach is learning, which is more emphasizes on the inquiry learning, which has relevant to the nature of science, which is not just a collection of facts and principles, but includes ways how to get the facts and principles as well as the scientists attitude in the basic science process, namely, observing, classifying, communicating, measuring, predicting, and concluding (Marjan, 2014 as cited in Said, Sutadji, & Sugandi, 2016).

According to Lindberg, learning with scientific methods means that students get knowledge through some processes that allow them to present the mental and physical behaviours of scientists. They are supposed as scientists, raising a question, learning a practical, finding useful approach, and answering the question scientifically (Lindberg, 2007). Another definition, Suharyadi states that a scientific approach is a body of techniques for investigating the phenomena, acquiring new knowledge, or correcting and integrating previous knowledge (Suharyadi, 2013). Summing up, from these definitions, it can be said that the scientific approach is a way to get knowledge through some steps as scientists conduct, particularly observing, classifying, communicating, measuring, predicting, and concluding.

In other words, the scientific approach in the 2013 curriculum includes some fundamental processes, namely through observation, questioning, trial, and then process the data or information, presenting data or information, followed by analyzing, reasoning, and concluding and creating. It is an approach of teaching that is designed with the same rigor as science at its best. In this case, learners make observations, develop hypotheses about phenomena, devise tests to investigate their hypotheses, and communicate their findings to others. With this nature, scholars believe that the scientific approach as a teaching method may encourage learners to be curious about science, to improve their oral communication and critical thinking.

2.1.1 Stages of Applying Scientific Approach

The scientific approach in the learning process means the learning process, which is organized to make learners to actively construct concepts, laws, or principles through activities of observing, hypothesizing, collecting data, analyzing data, drawing conclusions, and communicating the concepts, laws, and principles found (Hosnan, 2014). It is expected to encourage students to search for knowledge from multisource through observation and not to be given by teachers only. The scientific approach also emphasizes communication skills as well as scientific principles. The scientific approach allows teachers or curriculum developers to improve the learning process, namely by breaking the process down into steps or stages in detail, which

contain any instructions for the students to carry out any learning activities (Varelas & Ford, 2009, p. 31). The scientific approach trains students doing scientific activities such as defining some datum before observing, increasing learning to know, talent, and attention for themselves in questioning steps (Haerdar, Wello, & Haryanto, 2015). Furthermore, the stages of learning in the scientific approach in the 2013 Curriculum context are generally divided into five main stages: observing, questioning, experimenting, associating, and communicating (Abidin, 2014). Each of these stages is elaborated.

1. Observing is the initial stage of the scientific approach. It is a stage where students need to develop their curiosity, create a meaningful learning process, and help students acquire knowledge. It is "a deliberate and systematic activity to study a social phenomenon or real object through the utilization of the five senses and involving descriptive skill" (Hosnan, 2014, p. 40). The teacher asks the students to observe objects, events, phenomena, concepts, and procedures by using all of their senses to see, listen, read and watch, and integrate it with the learning material (Checkovich & Sterling, 2001, p. 32 Ratnaningsih, 2017). At the same time, students construct their knowledge and facilitate them to fulfill their need of know something. In this activity, the context is also presented to make students connect what they have learned with what they are going to learn (Suharyadi, 2013).
2. Questioning is the second stage of the scientific approach. It is a stage where students need to construct knowledge as a concept. Students are required to have critical thinking to evoke a high level of thinking questions. Questioning is the process of constructing knowledge in the form of concepts of social function in particular material, the procedure of structure text through group discussion or class discussion (Abidin, 2014). In this regard, students can show their active participation in the learning process. In this stage, the teachers have to facilitate the students with scaffolding to stimulate and encourage the students to ask. Based on the regulation of the Ministry of Education and Culture No. 81a (Permendikbud, 2013b) in this stage, students posed questions from what has been observed in the previous stage for gain more information and comprehension about the material. Questioning can be used by both teachers and students in the classroom for several specific purposes.
3. Experimenting is the third stage of the scientific approach. It is a stage where students need to acquire meaningful, real, and authentic learning and students have to do experiments, especially to the suitable materials (Suharyadi, 2013). In this stage, students get real or authentic learning, for example, they have to do experiments. As stated in the Regulation of Indonesia Ministry of Education and Culture No. 81a, 2013, in experimenting, the students have to read other sources or collect extra information in several ways, such as doing an experiment, observation, and interview, reading texts or books, or other sources or functional texts (Permendikbud, 2013b).
4. Associating is the fourth stage of the scientific approach. It is a stage where students need to attain the conclusion of knowledge through a logical thinking process and a systematic empirical factual statement that is

observed. Students must be more active and given more opportunities to learn. In this stage, students and teachers are engaged in learning activities, such as text analyzing, and categorization. Associating refers to grouping the ability of various ideas and associating various events to be part of memory (Ratnaningsih, 2017).

5. Communicating/networking is the last stage of the scientific approach. It is a stage where students need to develop students' skills to offer or demonstrate all knowledge and abilities that have been mastered verbally or nonverbally. In this stage, students communicate, demonstrate, and publish their learning products as a form of collaborative learning in which they face various changes. In collaborative learning, learners interact with empathy, mutual respect, and receive a deficiency or excess, respectively to create social interaction to gain meaningful learning (Nugraha & Suherdi, 2017).

2.1.2 Discovering Learning Theory

The discovery learning theory is a learning theory introduced in the 1960s by Jerome Bruner. Discovery learning according to him is an inquiry-based instructional approach in which the learner builds new knowledge from prior knowledge and active experience. In contrast to classical teaching methods, in which the learner is usually passive and expected to assimilate the knowledge presented by the teacher, discovery learning offers a learner-centred approach in which the learner discovers new knowledge through active, hands-on experiences, and construct new concepts based on his existing knowledge. This kind of learning is oriented to the process of learning, rather than on its content and information. "Practice in discovering for oneself teaches one to acquire information in a way that makes that information more readily viable in problem solving" (Bruner, 1961). Another important aspect of discovery learning is failure, which is viewed as an important element of learning to the extent that the learner has not really learned anything if he has not failed during the learning process.

Furthermore, the main attributes of discovery learning, as described by Bicknell-Holmes & Hoffman, are exploring and problem solving, which stimulate learners to actively approach the creation, acquisition and generalization of new knowledge instead of passively being exposed to lectures and practice, taking responsibility for learning in terms of the ability of learners to choose their own learning pace, and building new knowledge from the existing (Bicknell-Holmes & Hoffman, 2000). In order to comprehend the material, the learner must actively manipulate the information either concretely or abstractly, and use inductive reasoning to draw inferences and make generalizations. The students must then confirm or disprove these generalizations by themselves through "discovery learning" or with the assistance of a teacher through "guided discovery." This allows students to identify an organizational structure and create a "coding system" to mentally connect concepts together (Bruner, 1961).

Huitt explains that Bruner's principles of discovery learning claim instruction must provide students with experiences and contexts that make them willing and able to learn (readiness), be structured in a spiral manner so that the student keeps developing learned concepts in more and more detail, and be designed to facilitate

extrapolation that enables students to go beyond the information given (Huitt, 2009). Additionally, the role of the teacher in such an instructional process can be either provide students with information when necessary (guided discovery) or not provide them with information at all (Bruner, 1961).

In conclusion, discovery learning theory emphasizes that only individuals learn and develop his mind when he uses his mind, by performing the cognitive processes in the discovery process, students will acquire the intellectual thrill and satisfaction is intrinsic rewards, the only way that a person can learn the techniques of doing discovery is that it has a chance to do discover, and to make the discovery will strengthen memory retention. This is consistent with the cognitive processes required in learning to use the scientific approach.

2.2. Reading Comprehension

Many experts have defined reading comprehension (Nunan, 2003; Mikulecky, 2011). Reading comprehension is a fluent process of readers to combine information from a text and their own background knowledge to build meaning (Nunan, 2003). In addition, reading comprehension is a complex conscious and unconscious mental process in which the reader uses a variety of strategies to reconstruct the meaning that the author is assumed to have intended, based on data from the text and from the reader's prior knowledge (Mikulecky, 2011). It is the ability of understand and interpret information of a text correctly with the purpose is to get meaning from the written text (Grabe & Stoller, 2002).

Reading comprehension is a complex linguistic achievement. This means that it is an active thinking process that involves understanding the text as well as the purpose for reading. Other significant issues of comprehension are the background knowledge (prior knowledge) that the reader brings to the text, what the text suggests to the reader, the knowledge of words, and the specific reading strategies that the reader uses to make meaning of the text (Geary, 2006, as cited in Abidin, 2014). This means that reading activity connects the reader and the writer, although they live in different places and lives in different periods. Reading is a mental cognitive process, so as the result of this activity, the process of reading and responding is not directly observable.

The act of comprehending a written text is a complex one that depends on a number of different thinking processes within reader and how to use proper comprehension strategies during the reading process. These strategies can be described as special knowledge that readers consciously use as they attempt to identify with what they read. The comprehension strategies that used by the readers are specifically useful for them to know what the contents of the text. It is not surprising that the reader's general background knowledge of the world and of the topic about which they are reading play a critical role in the comprehension process (Pressley, 2002).

2.2.1 Teaching Reading Comprehension

Teaching is a complex process it does not only gives the information from the teacher to the students. There are many activities that can be doing especially when the process of teaching and learning in the classroom. The aim of teaching is to make

students become an effective and efficient reader. Teaching is the process of transferring knowledge from the teacher to the students or from someone to another, whether in a formal or informal situation (Barawati, 2018). Teaching is not an easy job, but it is necessary one, and can be very rewarding when we see our students' progress and know that we have helped to make it happen. It is true that some students can be difficult and stressful at times, but it is also worth remembering that at its best teaching can also be extremely enjoyable (Harmer, 2007, p. 23). The main task in teaching reading is to teach understanding. To assess the problem of what to teach when teaching understanding, we must try to determine what is likely to prevent a child from comprehending a given text. In the classroom, the teacher's job to promote this learning process by the use of an appropriate teaching act.

Thus, the teacher presents and explains new material in order to make it clear, comprehensible and available for learning, gives practice to consolidate knowledge, and test. In order to check what has been mastered and what still needs to be learned or reviewed. Also, the teachers' responsibilities in helping learners achieve these goals will be to motivate reading by selecting or creating appropriate texts, designing useful reading tasks, setting up effective classroom procedures, encouraging critical reading, and creating a supportive environment for practicing reading. Each learner has different strengths to build on and different weaknesses to overcome. Therefore, there can be no single, set, or rigid methodology for reading. Teachers will need to focus on different goals at different times and to use a range of materials and tasks (Hedge, 2001, p. 205). However, in reality, almost all students deal with obstacles comprehending a reading passage. Comprehending the text is one of the problems that students face in reading. They cannot focus on what they read during the reading activity and still have difficulty to get the ideas of the text. Answering the reading comprehension test will be time-consuming if they use inappropriate strategies. Another problem is that not every detail of information in the passage is needed to answer the reading questions, but students usually read the reading passage word by word (Zaim, 2016). Therefore, teachers need to find out appropriate approach to teaching reading comprehension.

3. METHODS

3.1. Design of Research

This research employed quantitative method research. It was selected for this study because the researcher proposed to examine the effect of scientific approach in teaching reading comprehension. Therefore, the design of this research was quasi-experimental which used a non-equivalent (pre-test and post-test) control-group design.

3.2. Population and Sample

The population in this study was all students at the twelfth grade students of SMAN 1 Wawonii who enrolled in academic year 2018, namely 100 students. The researcher selected the XII MIPA I class as the sample in experimental class and a number of participants were 25 students and the XII MIPA II as the sample in control class and a total of participants were 26 students.

3.3. Teaching Procedures

Teaching procedures by means of a scientific approach are explained as follows:

1. The first activity of the scientific approach was observing. Competence which developed was train seriousness, thoroughness, searching for information. In learning English focused reading, the students looked at the text;
2. The second step in the scientific approach was questioning. Learning activities was to ask questions about information that was not understood from what is observed or questions to obtain additional information about what is observed;
3. The third step in the scientific approach was experimenting. Learning activities were doing experiments, reading other sources except textbooks; observing objects/ events/ activities, interviews with informants;
4. The fourth step in the scientific approach was associating. The first activity of this study was process the information that has been collected. Second, after processing information gathered was looking for a solution from a variety of sources which had a different opinion. In this activity students tried to answer questions from the text; and
5. Step five in the scientific approach was communicating. Communicating was the student's activities to form communicating of class. Learning activities was to convey the results of observations, and conclusions based on the results of the analysis of oral, written, or other media.

3.4. Instrument of Research

This research applied a reading comprehension test, a questionnaire of SEEQ (Student Evaluation of Educational Quality), and open-ended questions as research instruments.

3.5. Technique of Data Analysis

In this research, the researcher applied *Paired Sample t-test* to examine significant score differences in students' reading comprehension before and after treatment by using scientific approach. Also, *Independent Sample t-test* to examine significant score differences between students is taught by using a scientific approach and students is taught by using a conventional approach.

4. FINDINGS AND DISCUSSION

4.1 Findings

A *Paired Sample t-test* applied to examine whether or not significant differences existed in students' pre-test and post-test reading comprehension as a result of experiencing instruction using scientific approach.

Table 4.1 The Result of Paired Samples Statistics
Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test	37.00	25	15.478	3.096
	Post-test	68.80	25	10.828	2.166

Based on the result of the table above, it pointed out mean score in the pre-test was 37.00 with its standard deviation 15.478. On the contrary, it pointed out mean score in the post-test was 68.80, with its standard deviation 10.828. This means that the data were homogenous.

Table 4.2 The Result of Paired Samples T-Test Analysis
Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-test – Post-test	31.800	11.892	2.378	36.709	26.891	13.370	24	.000

A statistical analysis of *Paired Samples T-test* analysis is applied to examine whether or not significant differences exist in students' pre-test and post-test reading comprehension as a result of experiencing instruction using scientific approach. The table above indicated that there was a significant difference in the mean scores for pre-test ($M = 37.00$, $SD = 15.478$) and post-test ($M = 68.80$, $SD = 10.828$) conditions; $t(24) = 13.370$, $p(.000) < 0.05$. The result indicated that there was significant differences existed in students' pre-test and post-test reading comprehension as a result of experiencing instruction using scientific approach.

An *Independent Sample T-test* applied to examine whether or not significant differences in students' test scores exist between those attending scientific approach and those experiencing conventional instruction.

4.3 Group Statistics of Independent Samples
Group Statistics

	Class	N	Mean	Std. Deviation	Std. Error Mean
NGainScore	1	25	31.80	11.892	2.378
	2	25	10.60	13.096	2.619

Based on the result of the table above, it pointed out mean score of N-Gain in experiment class was 31.80, with a standard deviation 11.892. On the contrary, it pointed out mean score of N-Gain in control class was 10.60, with a standard

deviation 13.096. This result revealed that significant differences in students' test scores existed between those attending scientific approach and those experiencing conventional instruction.

4.4 The Result of *Independent Samples T-Test*

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
NGainScore	Equal variances assumed	.071	.791	5.992	48	.000	21.200	3.538	14.087	28.313
	Equal variances not assumed			5.992	47.560	.000	21.200	3.538	14.085	28.315

An *Independent Samples T-test* is conducted to examine significant differences in students' test scores existed between those attending scientific approach and those experiencing conventional instruction. The result indicated that there was a significant difference in the mean scores between N-Gain students in experiment class and N-Gain students in control class ($M = 31.80$, $SD = 11.892$) and students were taught using conventional media ($M = 10.60$, $SD = 13.096$) conditions; $t(48) = 5.992$, $p(.000) < 0.05$. This result indicated that a significant differences in students' test scores existed between those attending scientific approach and those experiencing conventional instruction.

Meanwhile, a majority of students perceived the scientific in reading comprehension positively. In this case, mean score all items of SEEQ questionnaire were high enough due to most of students showed their positive responses towards the scientific approach.

4.2 Discussion

First and foremost, this research examined whether or not significant differences exist in students' pre-test and post-test reading comprehension as a result of experiencing instruction using scientific approach at XII MIPA I class of SMAN 1 Wawonii. The findings revealed that there is significant differences exist in students' pre-test and post-test reading comprehension as a result of experiencing instruction using scientific approach. On other words, there is a significant score difference on students' reading comprehension before and after they are taught by using the scientific approach, particularly in students' reading comprehension at XII MIPA I class of SMAN 1 Wawonii.

Next, the findings of the research revealed significant differences in students' test scores existed between those attending scientific approach and those experiencing conventional instruction. Besides, mean score of students' reading comprehension in experiment class were higher than mean score of students' reading comprehension

in control class. This means that students' reading comprehension that are taught using the scientific approach was more increased than students' reading comprehension that are taught using the conventional teaching instruction.

The last, mostly students' responses towards the scientific approach were positive that this approach increased their reading comprehension. In this case, students understood the reading materials easier when they are taught by using scientific approach, the scientific approach stimulated them to share their ideas, teacher's style of giving the explanation of the reading materials through scientific approach held their interest during class, and they were more enthusiasts as long as reading activities.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Based on the findings of this research, therefore the researcher determined important conclusion as stated as follow:

1. Significant differences existed in students' pre-test and post-test reading comprehension as a result of experiencing instruction using scientific approach.
2. A significant differences in students' test scores existed between those attending scientific approach and those experiencing conventional instruction.
3. Most students' responses towards the scientific approach were positive and this approach increased their reading comprehension. In this regard, the students' positive responses might be attributed to effectiveness of the scientific approach in teaching reading comprehension.

5.2 Recommendations

First of all, this research focused on teaching reading comprehension by means of the scientific approach to examine students' reading comprehension; therefore, it is recommended to the next scholars to examine the effectiveness of the scientific approach to specific English skills, for instance writing skill or other English skills. Then, this research merely focused on the effectiveness of teaching reading comprehension through the scientific approach thus it is necessary for the next researchers to examine students' motivation toward this teaching instruction. The last but not least, due to this research applied quasi-experimental, which used a non-equivalent (pre-test and post-test) control-group design. Thus, it is urged for the future researchers should apply different research designs, such as true experiment design or action research design.

References

- Abidin, A. (2014). *Desain Sistem Pembelajaran Dalam Konteks Kurikulum 2013*. Bandung: PT. Refika Aditama.
- Agustien, H. (2014). *The 2013 English Curriculum: The Paradigm, Interpretation and Implementation. Recent Issues in English Language Education*. Surakarta: UNS Press.
- Barawati, D. A. (2018). *The use of scientific approach to improve students' writing ability*. (Bachelor), State Institute for Islamic Studies (IAIN), Salatiga.

- Bicknell-Holmes, T., & Hoffman, P. S. (2000). Elicit, engage, experience, explore: Discovery learning in library instruction. *Reference Services Review*, 28(4), 313-322.
- Brown, H. D. (2001). *Teaching by Principles: An Interactive Approach to Language Pedagogy* (2nd ed.). New York: Addison Wesley Longman, Inc.
- Bruner, J. S. (1961). The act of discovery. *Harvard Educational Review*, 31(1), 26-32.
- Fauziati, E. (2014). *Method of teaching English as a Foreign Language (TEFL): Traditional method, designer method, communicative approach, scientific approach*. Surakarta: Era Pustaka Utama.
- Grabe, W., & Stoller, F. L. (2002). *Teaching and Researching Reading*. Britain: A Pearson Education Company.
- Haerdar, Wello, M. B., & Haryanto. (2015). *The effect of the scientific approach in teaching reading comprehension to the twelfth grade students of SMKN 1 Rangas*. (Magister Thesis), Universitas Negeri Makassar,
- Harmer, J. (2007). *How to Teach English*. Harlow: Pearson Education Limited.
- Hedge, T. (2001). *Teaching and Learning in the Language Classroom*. Oxford: Oxford Univeristy Press.
- Hosnan, M. (2014). *Pendekatan Saintifik dan Kontekstual dalam Pembelajaran Abad 21, Kunci Sukses Implementasi Kurikulum 2013*. Bogor: Ghalia Indonesia.
- Huitt, W. (2009). *Constructivism: Educational Psychology Interactive*. Valdosta, GA: Valdosta State University.
- Kemendikbud. (2013b). *Modul Pelatihan Implementasi Kuriulum 2013*. Jakarta: Kementerian Pendidikan dan Kebudayaan RI
- Lindberg, C. (2007). *The Beginnings of Western Science: The European Scientific Tradition in Philosophical, Religious, and Institutional Context. Prehistory to A.D. 1450: The University of Chicago Press*.
- Majid, R. (2014). *Pendekatan Ilmiah Dalam Implementasi Kurikulum 2013*. Bandung: Rosda.
- Mikulecky, B. S. (2011). *A Short Course in Teaching Reading: Practical Techniques for Building Reading Power*. Sacramento: California Dept. of Education.
- Muttaqin, G. (2015). *A descriptive analysis of teacher talk in leading the teaching learning activities through the stages of scientific approach: A case study in a junior high school in Bandung*. (Bachelor), Universitas Pendidikan Indonesia, Bandung.
- Nugraha, I. S., & Suherdi, D. (2017). Scientific approach: an English learning-teaching (ELT) approach in the 2013 curriculum. *Journal of English and Education*, 5(2), 112-119.
- Nunan, D. (2003). *Practical English Language Teaching*. New York: Mc Graw Hill.
- Permendikbud. (2013a). No.68 Tahun 2013 tentang Kerangka Dasar dan Struktur Kurikulum Sekolah Menengah Pertama/Madrasah Tsanawiyah.
- Permendikbud. (2013b). No.81a Tahun 2013 tentang Implementasi Kurikulum.
- Pressley, M. (2002). *Reading Instruction that Works: The Case for Balanced Reading* (2 ed.). New York: Guilford.
- Ratnaningsih, S. (2017). Scientific approach of curriculum 2013: Teachers' implementation in English language teaching. *English Review: Journal of English Education*, 6(1), 33-40.

- Said, I. M., Sutadji, E., & Sugandi, M. (2016). The scientific approach-based cooperative learning tool for vocational students vocation program of autotronic (automotive electronic) engineering. *IOSR Journal of Research & Method in Education (IOSR-JRME)*, 6(3), 67-73.
- Shofwan, M. (2017). The use of scientific approach in teaching English as a foreign language in SMPN 1 Jakarta. *Jurnal Edulingua*, 4(1), 1-6.
- Snow, C. (2002). *Reading for Understanding : Toward a Research and Development Program in Reading Comprehension*. Santa Monica: RAND Education.
- Suharyadi. (2013). *Exploring scientific approach in English language teaching*. (Bachelor), The State of Malang University, Malang.
- Untari, S. D. (2017). *The implementation of scientic approach in teaching reading comprehension for tenth grade students of SMAN 2 Karanganyar*. (Bachelor), The State Islamic Institute of Surakarta, Surakarta.
- Varelas, M., & Ford, M. (2009). *The scientific method and scientific inquiry: Tensions in teaching and learning*. USA: Wiley Inter Science.
- Wieman, C., & Gilbert, S. (2015). Taking a scientific approach to science education. *Microbe*, 10(4), 152-156.
- Zaim, M. (2016). *Implementing Scientific Approach to Teach Speaking and Writing Integratedly*. Paper presented at the 11th FEELTA International Conference, Far Eastern Federal University, Vladivostok, Russia.