

**ENGLISH AS THE MEDIUM OF INSTRUCTION (EMI) IN
TEACHING NATURAL SCIENCE SUBJECT AT MTs
BILINGUAL NU PUCANG SIDOARJO**

Thesis

Submitted in partial fulfillment of the requirement for the degree of
Sarjana Pendidikan (S.Pd.) in Teaching English



By:

Putri Kurnia Yuniarti
NIM D05213026

ENGLISH LANGUAGE EDUCATION DEPARTMENT
FACULTY OF EDUCATION AND TEACHER TRAINING
UIN SUNAN AMPEL SURABAYA

2019

PERNYATAAN KEASLIAN TULISAN

Yang bertanda tangan di bawah ini:

Nama : Putri Kurnia Yuniarti
Nim : D05213026
Semester : XIII (Tiga Belas)
Fakultas Prodi : Tarbiyah dan Keguruan Pendidikan
Bahasa Inggris

Dengan menyatakan sebenar-benarnya bahwa skripsi yang berjudul **"English as The Medium of Instruction (EMI) in Teaching Natural Science Subject at MTs Bilingual NU Pucang Sidoarjo"** adalah benar-benar merupakan hasil karya sendiri, bukan merupakan pengambil-alihan tulisan atau pikiran orang lain yang saya akui sebagai hasil tulisan atau pikiran sendiri. segala materi yang diambil dari karya orang lain hanya digunakan sebagai acuan dengan mengikuti tata cara dan etika penulisan karya ilmiah yang ditetapkan oleh jurusan.

Surabaya 23 Desember 2019

Putri Kurnia Yuniarti



Putri Kurnia Yuniarti
NIM. D05213026

ADVISOR APPROVAL SHEET

The thesis by Putri Kurnia Yuniarti entitled "English as The Medium of Instruction (EMI) in Teaching Natural Science Subject at MTs Bilingual NU Pucang Sidoarjo" has been approved by the thesis advisors for further approval by the boards of examiners.


Surabaya, 23rd of December 2019

Advisor I,



Hilda Izzati Madjid, MA
NIP. 198602102011012012

Advisor II,



H. Mokhamad Syaifudin, M.Ed, Ph.D
NIP. 197310131997031002

APPROVAL SHEET OF EXAMINER

This thesis by Putri Kurnia Yuniarti "*English as The Medium of Instruction (EMI) in Teaching Natural Science Subject at MTs Bilingual NU Puncung Sidoarjo*" has been examined on 23rd of December 2019 by the boards of examiners.



Mas'ud, M.Ag. M.Pd.I

NIP. 1963011231993031002

Examiner I,

Rizka Safrivani, M.Pd

NIP. 198409142009122005

Examiner II,

Siti Asmivah, M.Tesol

NIP. 197704142006042003

Examiner III,

Hilda Izzati Madjid, MA

NIP. 198602102011012012

Examiner IV,

Rakhiyawati, M.Pd

NIP. 197803172009122002



KEMENTERIAN AGAMA
UNIVERSITAS ISLAM NEGERI SUNAN AMPEL SURABAYA
PERPUSTAKAAN

Jl. Jend. A. Yani 117 Surabaya 60237 Telp. 031-8431972 Fax.031-8413300
E-Mail: perpus@uinsby.ac.id

LEMBAR PERNYATAAN PERSETUJUAN PUBLIKASI
KARYA ILMIAH UNTUK KEPENTINGAN AKADEMIS

Sebagai sivitas akademika UIN Sunan Ampel Surabaya, yang bertanda tangan di bawah ini, saya:

Nama : Putri Kurnia Yuniarti
NIM : D05213026
Fakultas/Jurusan : Tarbiyah dan Keguruan/Pendidikan Bahasa Inggris
E-mail address : putrikurniayuniarti@gmail.com

Demi pengembangan ilmu pengetahuan, menyetujui untuk memberikan kepada Perpustakaan UIN Sunan Ampel Surabaya, Hak Bebas Royalti Non-Eksklusif atas karya ilmiah :

☒ Skripsi ☐ Tesis ☐ Desertasi ☐ Lain-lain (.....)

yang berjudul :

ENGLISH AS THE MEDIUM OF INSTRUCTION (EMI) IN TEACHING NATURAL
SCIENCE SUBJECT AT MTs BILINGUAL NU PUCANG SIDOARJO

beserta perangkat yang diperlukan (bila ada). Dengan Hak Bebas Royalti Non-Eksklusif ini Perpustakaan UIN Sunan Ampel Surabaya berhak menyimpan, mengalih-media/format-kan, mengelolanya dalam bentuk pangkalan data (database), mendistribusikannya, dan menampilkan/mempublikasikannya di Internet atau media lain secara *fulltext* untuk kepentingan akademis tanpa perlu meminta ijin dari saya selama tetap mencantumkan nama saya sebagai penulis/pencipta dan atau penerbit yang bersangkutan.

Saya bersedia untuk menanggung secara pribadi, tanpa melibatkan pihak Perpustakaan UIN Sunan Ampel Surabaya, segala bentuk tuntutan hukum yang timbul atas pelanggaran Hak Cipta dalam karya ilmiah saya ini.

Demikian pernyataan ini yang saya buat dengan sebenarnya.

Surabaya, 6 Januari 2020

Penulis


(Putri Kurnia Yuniarti)
nama terang dan tanda tangan

ABSTRACT

Yuniarti, Putri Kurnia. 2019. *English as The Medium of Instruction in Teaching Natural Science Subject at MTs Bilingual NU Pucang Sidoarjo*. A thesis. English Teacher Education Department, Faculty of Education and Teacher Training, Sunan Ampel State Islamic University. Surabaya. Advisors: Hilda Izzati Madjid, M.A and H. Mokhamad Syaifudin, M.Ed., Ph.D.

Key Words : *English as the Medium of Instruction (EMI), Teaching Natural Science.*

The teachers' competency in using English is a key for successful in teaching and learning process. The teachers are required to be able to use English in explaining the material especially for the non-English teacher. This qualitative research aimed to investigate teacher's technique and teacher's problems in using English as the Medium of Instruction (EMI) in teaching natural science subject. The research was conducted by observing and interviewing the natural science teacher in MTs Bilingual NU Pucang Sidoarjo. The findings showed that the techniques that the teacher used were tapping into prior knowledge by reminding and reviewing the point of the previous material , providing wait time after asking a question by giving a space time to ask some questions for the students, giving instruction to students to discuss in pair about information related to the materials, using multimodal presentation by implementing the creative learning by bringing a leaf as a realia and drawing a picture, repeating and rephrasing important concepts by checking students' understanding on the material and repeating new words or vocabularies explained and lastly is by using standard topic for the lesson by making a students' book together with the others teacher who teach in the same subject. In addition, the finding also showed that the teacher problems in using English as the Medium of Instruction (EMI) in teaching natural science subject were language difficulties which include polysemous word and different vocabularies, recognizing specific word in a category, and then text analysis.

ABSTRAK

Yuniarti, Putri Kurnia. 2019. *English as The Medium of Instruction in Teaching Natural Science Subject at MTs Bilingual NU Pucang Sidoarjo*. Skripsi. English Teacher Education Department, Fakultas Tarbiyah dan Keguruan, Universitas Islam Negeri Sunan Ampel Surabaya. Dosen Pembimbing: Hilda Izzati Madjid, M.A dan H. Mokhamad Syaifudin, M.Ed., Ph.D.

Key Words : *Bahasa Inggris sebagai Bahasa Pengantar, Pembelajaran IPA*

Kompetensi guru dalam menggunakan bahasa Inggris merupakan kunci untuk keberhasilan dalam proses belajar mengajar. Para guru dituntut untuk dapat menggunakan bahasa Inggris dalam menjelaskan materi khususnya untuk guru non-Inggris. Penelitian deskriptif kualitatif ini bertujuan untuk menjawab pertanyaan penelitian yaitu mengenai teknik guru dan masalah guru dalam menggunakan Bahasa Inggris sebagai Bahasa pengantar dalam mengajar mata pelajaran IPA. Penelitian dilakukan dengan mengamati dan mewawancarai guru IPA di sekolah ini. Hasil penelitian menunjukkan bahwa teknik yang digunakan guru adalah memanfaatkan pengetahuan sebelumnya dengan mengingatkan dan meninjau poin materi sebelumnya, menyediakan waktu tunggu setelah mengajukan pertanyaan dengan memberikan jeda kepada siswa untuk mengajukan pertanyaan, memberikan instruksi kepada siswa untuk berdiskusi dengan menyuruh siswa untuk berdiskusi dengan temannya mengenai informasi dan materi yang relevan, menerapkan pembelajaran yang kreatif dengan membawa daun sebagai realia, mengulangi konsep-konsep penting dengan mengecek pemahaman siswa pada materi serta mengulang kata – kata baru yang telah diajarkan, dan menggunakan topik standar untuk pelajaran dengan membuat buku bersama dengan guru yang mengajar dalam mata pelajaran yang sama. Adapun hasil untuk masalah kesulitan yang dialami guru dalam penggunaan bahasa Inggris sebagai bahasa pengantar antara lain adalah kesulitan bahasa yang mana mencakup perihail kosa kata yang berbeda dan kata yang mempunyai arti lebih dari

satu, mengenali suatu kata tertentu dalam sebuah kategori serta menganalisa teks.

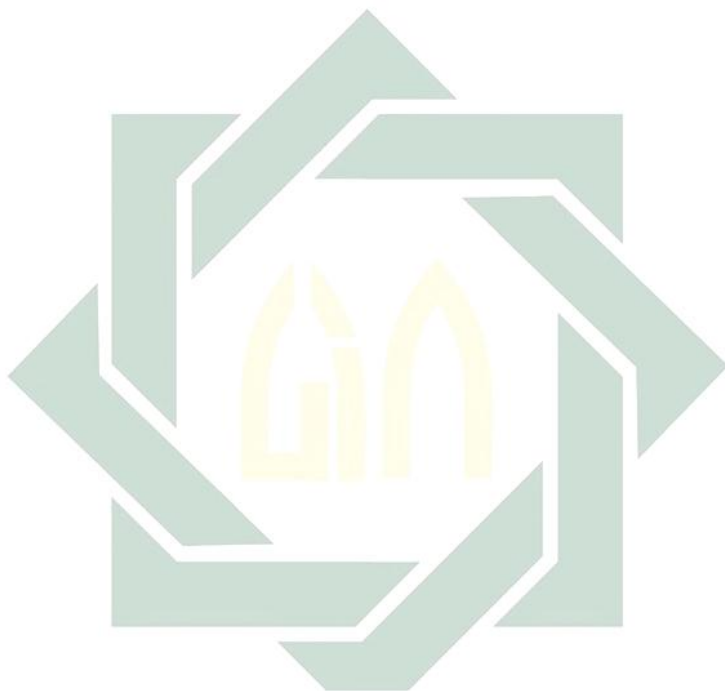


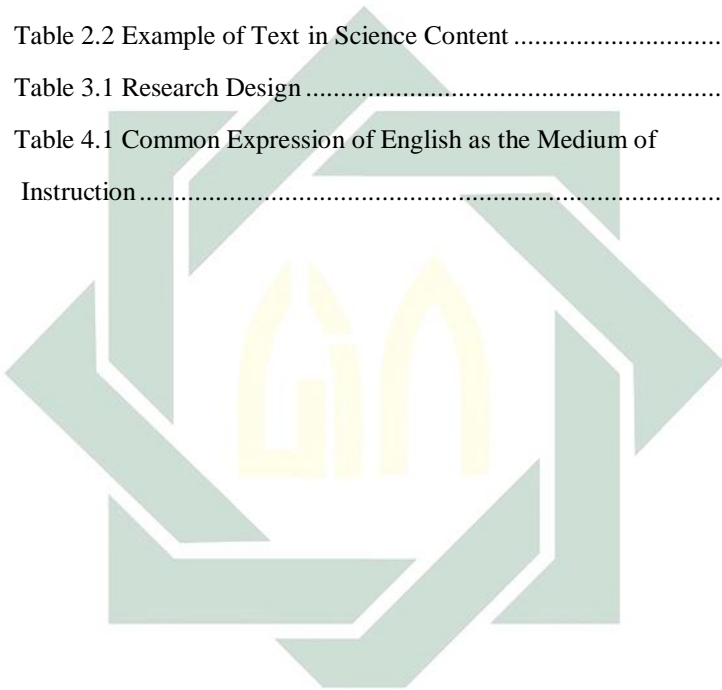
TABLE OF CONTENT

COVER.....	i
ADVISOR APPROVAL SHEET.....	ii
APPROVAL SHEET OF EXAMINER.....	iii
LEMBAR PUBLIKASI.....	iv
MOTTO.....	v
DEDICATION SHEET.....	vi
ABSTRACT.....	vii
ABSTRAK.....	viii
ACKNOWLEDGEMENT.....	x
PERNYATAAN KEASLIAN TULISAN.....	xii
TABLE OF CONTENTS.....	xiii
LIST OF TABLES.....	xv
LIST OF APPENDICES.....	xvi
LIST OF ABBREVIATION.....	xvii
CHAPTER I INTRODUCTION.....	1
A. Background of the Study.....	1
B. Research Questions.....	5
C. Objectives of the Study.....	6
D. Significance of the Study.....	6
E. Scope and Limitation of the Study.....	7
F. Definition of Key Terms.....	8
CHAPTER II REVIEW OF RELATED LITERATURE.....	9
A. Theoretical Framework.....	9
1. English as the Medium of Instruction (EMI).....	9
2. The Use of English as the Medium of Instruction.....	10
B. Teaching Natural.....	11
C. Classroom Techniques in Using EMI.....	12
D. Problems in Using EMI in Teaching Science.....	15
E. Previous Study.....	19
CHAPTER III RESEARCH METHOD.....	21

A. Research Design	21
B. Subject of the Study	21
C. Research Location	22
D. Researcher Presence	22
E. Data and Source Data	22
F. Data Collection Technique	23
G. Research Instrument	25
H. Data Analysis Technique	29
 CHAPTER IV RESEARCH FINDING AND DISCUSSION	 30
A. Research Finding	31
1. Teachers' Technique in Using (EMI) in teaching natural science subject	31
2. Teacher Problem in (EMI) in Teaching Natural Science Subject	42
B. Discussion	47
1. Teachers' technique in using (EMI)	48
a) Tapping into prior knowledge	48
b) Providing wait time after asking a question	49
c) Giving instruction students to discuss	50
d) Using multimodal presentation	50
e) Repeating and rephrasing important concepts	51
f) Using standard and topic for the lesson	52
2. Problems in using (EMI) in Teaching Natural Science	54
a) Language difficulties	55
b) Recognize specific words in a category	56
c) Text analysis	57
 CHAPTER V CONCLUSION AND SUGGESTION	 58
A. Conclusion	58
B. Suggestion	59
 REFERENCES	 61

LIST OF TABLES

Table 2.1 Different Vocabularies in English and Natural Science	17
Table 2.2 Example of Text in Science Content	18
Table 3.1 Research Design	28
Table 4.1 Common Expression of English as the Medium of Instruction	40

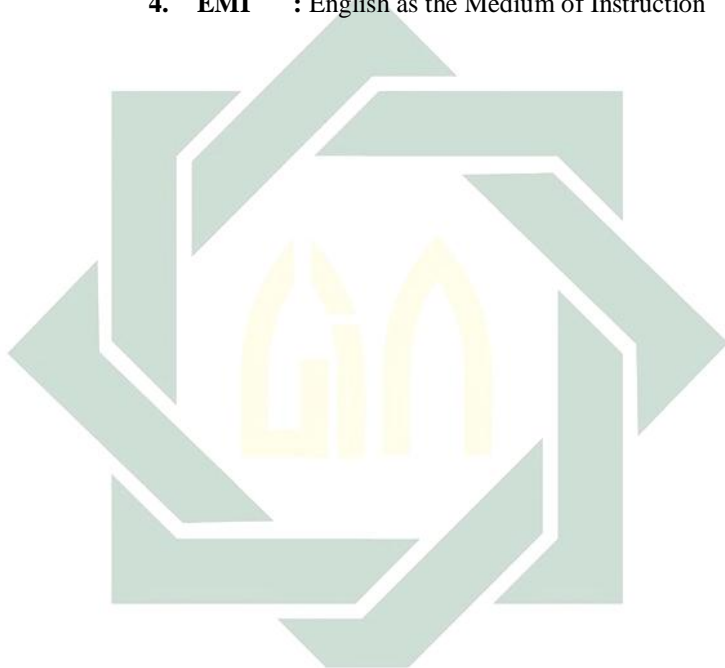


LIST OF APPENDICES

APPENDIX 1 OBSERVATION CHECKLIST	64
APPENDIX 2 THE RESULT OF OBSERVATION CHECKLIST	66
APPENDIX 3 TEACHER INTERVIEW GUIDELINE.....	68
APPENDIX 4 TEACHER INTERVIEW RESULT	72
APPENDIX 5 DOCUMENTATION OF OBSERVATION.....	76
APPENDIX 6 SURAT TUGAS	77
APPENDIX 7 FORM VALIDASI INSTRUMENT	78
APPENDIX 8 FORM PERSETUJUAN MUNAQSAH	79
APPENDIX 9 KARTU BIMBINGAN	80
APPENDIX 10 SURAT BALASAN DARI SEKOLAH	81

LIST OF ABBREVIATION

1. **UIN** : Universitas Islam Negeri
2. **MTs** : Madrasah Tsanawiyah
3. **NU** : Nahdlatul Ulama
4. **EMI** : English as the Medium of Instruction



CHAPTER I

INTRODUCTION

This chapter consists of the background of the study that describes the reasons why the researcher wants to investigate the study. Next, the problems are defined along with the objectives of the study. It is continued by the significance of the study to talk about how the results of the study will be useful. Some limits about what are included in this study are given in the scope and limit of the study. Then, in the last part is the definition of key terms.

A. Background of the Study

The development of era changes English as foreign language (EFL) to English as the Medium of Instruction (EMI). This chance allows that English as the Medium of Instruction (EMI) can be implemented in universities, secondary school, or even for primary school. According to Haagen-Schützenhöfer Claudia, Mathelitsch Leopold stated that English as the Medium of Instruction means that a language is used for teaching subject matter such as Science, Mathematics, Social and others in teaching and learning process.¹ It aims that the use of English as the Medium of Instruction (EMI) will improve the quality of the school and carry out better chance for future. So that's why, many schools try to apply the use of English as the Medium of Instruction (EMI) in teaching and learning process.

The implementation of the use English as the Medium of Instruction (EMI) has been developed in the school which has the basic as the bilingual school. In the reality, many schools or institution has been using English as language of medium instruction even though in English speaking countries or in non – English speaking countries. Crystal argued that a

¹ Haagen-Schützenhöfer Claudia, Mathelitsch Leopold, “*English as a Medium of Instruction in Science-Teaching*” Institute for Theoretical Physics, University of Graz, Austria. P.1

language can become global language which divided into two main ways. The first way is by becoming English as the formal language in a particular country. It means that countries have been using English as a main language to communication in their life such as in domains of government, the law courts, the media and also the educational system. The second way is a language categorized as a foreign language or as medium of instruction to communication in several aspects such as in the educational system of a country or some institution which are implementing English as the Medium of Instruction (EMI), even though the status of language is informal language.² For example English is used children who study in school, or the adults who use English even though they learn badly in their life.³

Based on the phenomenon above, the implementation of English as the Medium of Instruction (EMI) begins to be applied in schools in order to make improve their standard. MTs Bilingual NU Pucang Sidoarjo is one of junior high school in Sidoarjo which is implementing English as the Medium of Instruction (EMI) in teaching subject matter. This school becomes one of favorite schools because of the English as the Medium of Instruction (EMI) implementation. Besides, the school has been working together with Cambridge University, London. In addition, the facilities in this school support teaching and learning process and it has many programs to improve student's ability in using English.

Based on preliminary research, teachers in MTs Bilingual NU Pucang Sidoarjo must have good competences both in subject matter and English, even though the teachers did not study in English department. The researcher conducted mini interview with the natural science teacher. The teacher stated that, there are many steps needed to be accepted as teachers in this school such as the teachers have to pass the written test, interview, and micro teaching practice. The test categorized into two parts which there are test in Bahasa and in

² Crystal, David. English as a Global Language. Cambridge University Press: London, 2003:4

³ *Ibid* page 4

English. After the teachers have passed the written test it means the teachers can follow the next test those are interview and micro teaching practice. In this part, the teachers should practice how the way they to teach the students. The teachers asked to teaching practice about the appropriate major with their competence. By this test, the teachers' competence in their major and English proficiency can be known. The teacher stated that teachers in MTs Bilingual NU Pucang Sidoarjo be demanded to master important skills in English such as writing, listening, reading, and speaking to conduct teaching and learning process. However, the teachers can use Bahasa if they get some difficulties in explaining to the students.

The situation above is an example that in teaching and learning process cannot be separated from many problems happen. Julie Darden stated that English as the Medium of Instruction (EMI) makes the teachers' view more idealistic, because English as the Medium of Instruction (EMI) is a way to improve communication and exchange ideas and create relation between countries.⁴ It means that the implementation of English as the Medium of Instruction (EMI) in teaching and learning process is a personal challenge to improve personally and professionally as the teachers in their career. Additionally, Wahyuningsih argued the quality of the teachers who teach subject matter but are demanded by using English as the Medium of Instruction (EMI) is still in low level and they cannot achieve the standardization that has been determined.⁵ According that statement, teachers will face difficulties in using English as the Medium of Instruction (EMI) for teaching subject matter because most of the teachers do not have Basic English education. Julie Darden stated that teachers' problems in using English as the Medium of Instruction are lack of guidelines on how to deliver knowledge through EMI, lack of teaching resources, lack of a standard level of English for EMI teachers, exam and assessment are problematic in English as

⁴ Julie Dearden, Senior Research and Development Fellow, *English as Medium of Instruction (EMI)*, Department of Education, University of Oxford p.8

⁵ Wahyuningsih, "*Penggunaan Metode Team Teaching sebagai inovasi pengajaran sains (IPA) dalam bahasa inggris di sekolah RSBI*". Padang 2004). p.4

The Medium of Instruction (EMI), and teachers have limited English proficiency then they sometimes use home language in their teaching.⁶

To find out the problems which encountered teachers in using English as the Medium of Instruction (EMI), the researcher conducts a further preliminary research in MTs Bilingual NU Pucang Sidoarjo which has been interviewed the teachers especially in non-English teachers because the role of teachers have to teach by using English as the Medium of Instruction. Based on the result in preliminary research, the teachers have difficulties in teaching Science subject such as lack of vocabularies, difficult in explaining the Science material by using English because of the vocabularies in English and Science sometimes different, difficult in giving instructions, lack of strategies that can be used to make the students understand well about the material, and also lack of workshop for developing the teachers' knowledge and quality better.

Several previous studies that related with this researcher were found. The previous study was entitled "Learning to Teach Science Using English as the Medium of Instruction".⁷ It has written by Peter Hudson. In his research, he explored and described Malaysian pre - service teachers' perception about their preparation for learning to teach Science by using English as Medium Instruction. The writer used questionnaire to collect the data from fifty Malaysian pre-service teachers. The result of this research shows that fifty pre service teachers indicated that English vocabulary, grammar, and pronunciation are important things to development of the concept in science education.

This research has similar topic with the previous study mentioned above which took a focus on learning science by using English as the Medium of Instruction (EMI). However, the purpose and subject of this research quite different. The research done by Peter Hudson only recovered about pre -

⁶ *Ibid* p.9

⁷ Peter Hudson, "*Learning to teach science using English as medium of instruction*" Thesis. Queensland University of Technology. 2009

service teachers' perception about their preparation for learning by using English as the Medium of Instruction (EMI) which the subject is pre – service teacher in the first year of a new bachelor of education studies (primary science) degree and the subject science in that research refers to about the knowledge such as about civilization, citizenship, information and communication technology, integrated mathematics and etc. Whereas this research recovered about the teacher techniques in using English as the Medium of Instruction (EMI) and also what the teachers' problems toward using English as the Medium Instruction in teaching subject matter is. In the other hand, subject in this research is science lesson which implemented in many schools.

Based on the phenomenon above, it encourages the researcher to conduct a research at MTs Bilingual NU Pucang Sidoarjo which tries to analyze the teachers' techniques in teaching and also what the teacher problems about the use of English as the Medium of instruction (EMI) in non-English subject such as social, math, science, religion and others. In this case, the subject that the researcher wants to be focused on this research is natural science. Natural science is using textual information to master this subject. Besides that, teaching natural science by using English as the Medium of Instruction (EMI) in teaching and learning process will give challenges to the teachers because in natural science there are many vocabularies or terms are written in scientific words. Therefore, the researcher wants to conduct a research by the title ***“English as The Medium of Instruction (EMI) in Teaching Natural Science at MTs Bilingual NU Pucang Sidoarjo”***.

B. Research Questions

This study attempts to answer the following research questions:

1. What are the teacher's techniques in teaching natural science by using English as the Medium of Instruction (EMI) at MTs Bilingual NU Pucang Sidoarjo?

2. What are the teacher problems in using English as the Medium of Instruction (EMI) in teaching natural science subject?

C. Objectives of the Study

This study aims to find out the use of English as the Medium of Instruction (EMI) in teaching natural science at MTs Bilingual NU Pucang Sidoarjo. The descriptions of it are described below;

1. To describe the teacher's techniques in teaching natural science by using English as the Medium of Instruction (EMI) in MTs Bilingual NU Pucang Sidoarjo.
2. To identify the teacher problems toward using English as the Medium of Instruction in teaching natural science subject.

D. Significance of the Study

This research expected to give information any use for the teachers especially for the non-English teachers who teach subject matter by using English as the Medium Instruction (EMI). In this study, the researcher conducted a research which focuses on the use English as the Medium of Instruction (EMI) in teaching natural science subject. The importance of this research are describing below:

1. The Teachers

For the teachers, this research expected that the teachers especially for the non-English teachers will understand well about how the ways use English as the Medium of Instruction (EMI) when they teach their students in teaching subject matter like natural science subject.

2. The Future Researcher

For the future researchers, the result of this research will become to add more views on English as the Medium of Instruction (EMI) references and it can be useful for further researchers who have similar topics with this research that focuses on teaching subject matter by using English as the Medium of Instruction (EMI). Additionally, the researcher hopes that the other researchers will get much information with this topic.

E. Scope and Limitation

This research is designed to analyze and to investigate teachers' techniques in using English as the Medium of Instruction (EMI) in teaching natural science and what the teacher problems toward using English as Medium of Instruction (EMI) in their teaching and learning process.

The researcher been conducted a research at MTs Bilingual NU Pucang Sidoarjo. The reason why the researcher took research in this school, because this school is a junior high school which has the basic Islamic school and also this school has good standardization and able to compete with the others school. It showed that the process of accepting the students very strict. The students who want to enroll in this school will be tested in English and in Bahasa, because the basic of this school is bilingual school. Additionally, this school has received many accomplishments such in academic and non – academic. For example, the students in this school being the first winner on the national robotic competition. The infrastructures also supports for the students need to grasp their achievement. In this school, there are many programs which support the use of English as the Medium of Instruction such as the implementation of the use English to communication every day in this school. In the other side, the curriculum on this school has been cooperated with Cambridge University, London. So, the teachers in this school should have the competence and high quality to teach the students especially when they use English as the Medium of Instruction in teaching

subject matter. The researcher chose biology teacher as the subject of this research because of in biology subject there are many words, vocabularies, terms are written in scientific words and also the arrangement of sentences more complex rather than the others subject.

F. Definition of Key Terms

To make the readers easy to understand about the main idea of this research, some definitions of key terms are provided. The descriptions are described below:

1. English as the Medium of Instruction (EMI)

According to Villegas English as the Medium of Instruction (EMI) is a language which is used to teach. Here, means that English as the Medium of Instruction (EMI) is utilizing a foreign language implemented in different subject which has aims to develop the quality of in teaching and learning process especially in bilingual schools.

2. Natural Science Subject

Science covers more than to obtain of knowledge. It investigates the systematic and organized which has correlation with the natural world and phenomena.⁸ The meaning of natural science subject here refers to a kind of material that implementing and learning to the students in this school which talk about nature and it is divided into three categories that are biology, chemistry, and also physic. The natural science is using textual information which if taught in English it covers about the different vocabularies, technical terms, and the arrangement of the sentences in natural science are written in scientific words.

⁸ An addendum to the GEOL 1122 reading on “What is science?”. University of Georgia.
<http://www.gly.uga.edu/> Accessed on, January, 2nd 2017

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter, the researcher describes the theories that related with the study. The researcher describes the relevant literatures in order to support the issues of the research. This chapter explains about the definition of English as The Medium of Instruction, teaching natural science subject, classroom techniques in using English as The Medium of Instruction, problems in using English as The Medium of Instruction. Then, the last is previous studies.

A. Theoretical Framework

1. English as the Medium of Instruction (EMI)

English is as one of languages in the world, English is not language with the larger number of the native speakers, but it becomes popular language. As Jeremy Harmer stated that English is as *lingua franca*, a language widely adopted to communicate between two people in different region since English is known well as International language. Thus, it makes English mastered by many people in the world.

According to Villegas, Medium of instruction is a language which is used by the teacher to teach.⁹ English as the Medium of Instruction (EMI) is instead of the mother-tongue, EMI is a foreign language which is used or implemented as a 'tool' to communicate in different subjects. The concept of EMI was promoted by the Austrian Ministry of Education to improve and intensify the use of foreign language education at schools. Globalization era has been changed the development and improvement of communication technologies. However, one of the main points of the function global communication is a general language which has been understood by everyone. Based on that statement, it encourage many people learn

⁹ Kusmastuti, Galih "Student's Perception on the Use of English as Medium of Instruction in RSBI at SMPN 2 Magelang". Universitas Sanata Dharma. Yogyakarta. 2013. *Cited Thesis*

English not only in English subject but also in other subjects, as well as in technology and in economics. Additionally, English as the Medium of Instruction (EMI) was designed as a flexible concept which can be used in all subjects as well as in all forms and types of school at the level of secondary education.¹⁰

2. The Use of English as the Medium of Instruction

Based on the Julie Darden's explanation on the background of the study said that English as the Medium of Instruction (EMI) has begun to be implemented in many countries. In the other side, the English language is not only used to communication with others, but also applied in many aspects such as in education, social, institution or others which called English as the Medium of Instruction. The use of English as the Medium of Instruction (EMI) also implemented in almost many school which have the basic concept like international school or bilingual school. The use of English as the Medium of Instruction is not easy. Joyce Kling Soren stated that providing broad scale programs in English is not without concern. By this way, the effect of English as the Medium of Instruction will be increase and make concern include fear of domain loss of the national language, the development students after learning by using national language, students drop-out, reduced knowledge of the use national language or additional foreign language and also concern about the effect on the quality of teaching and learning.¹¹ Additionally, the use of English as the Medium of Instruction (EMI) has a goal in order to achieve international standard and also want to make the development of teaching and learning process be better.

In educational side, the use of English as the Medium of Instruction give a challenges to the teachers who teaches the students by using English as the Medium of Instruction in teaching and learning process because the teacher must have good quality in competency and also English proficiency and

¹⁰ *Ibid*

¹¹ Soren, Joyce Kling "Teacher Identity in English-Medium Instruction: Teacher Cognitions from a Danish Tertiary Education Context". Linguistics. University of Copenhagen. Faculty of Humanities, 2013. P. 3

the overall of the English standard.¹² Mc Keon argued that there are many teachers who have problems in their competence and proficiency in the new medium of instruction.¹³ Additionally, the teachers demand to have their own way to ensure the students understand about the material that learned by the teacher, the teachers also need to improve students' comprehension in teaching and learning subject matter especially in science and mathematics, the teachers have to be aware on the use of language in classroom and also encourage the interaction about the subject matter in teaching and learning process.¹⁴

B. Teaching Natural Science

According to Dr. Sheldon Gottlieb states that Natural Science is an intellectual activity carried on by humans that are designed to discover information about the natural world in which humans live and the ways which this information can be organized into meaningful patterns.¹⁵ Additionally, Srini M. Iskandar argues that natural science is a one of subjects which has relation with the nature which learn phenomenon that happen in the nature.¹⁶ Based on the definitions of natural science above, it can be conclude that natural science is not only knowledge about the nature and phenomenon that happen but also it is about the process how to find the knowledge about that nature.

Teaching natural science by using English language cannot be separated from the difficulties which encountered by the teachers especially for non-English teachers who teach non-English subject but should teach the students by using English language. According to Henderson and Wellington said that the

¹² *Ibid*

¹³ McKeon, D "Language Culture and Schooling in Educating Second Language Children" ed. Genesee, F. Cambridge University Press. New York. 1994. P.3

¹⁴ McDonough, J.T "Making the Connection the Science Teacher". 76(3): 34 -37.

¹⁵ An addendum to the GEOL 1122 reading on "*What is science?*". University of Georgia. <http://www.gly.uga.edu/> Accessed on, January, 2nd 2017

¹⁶ Srini M. Iskandar. (1996). "*Penelitian Ilmu Pengetahuan Alam*". Jakarta: Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan dan Kebudayaan.

biggest difficulties in teaching and learning Science are from the barrier aspect.¹⁷ Language barrier means there are a lot of specific terms in the Science materials, but the teachers or students have limited ability of English because they often use English in general or daily aspect not in specific content like in natural science.

C. Classroom Technique in Using English as the Medium of Instruction

As professional teachers who are using English as the Medium of Instruction (EMI) in teaching natural science subject should be aware towards of their teaching techniques of using English as the Medium of Instruction. Not all of the teachers were using same instruction in teaching and learning process, they have many differentiating instructions. It means that the teachers using many varieties of instructional strategies to anticipate the diversity of the students in the classroom because not all of the students have the same learning styles, interest to something, special needs.¹⁸ So, it also means that the teachers have to controlling speech and using word walls, visuals, and small group learning activities to make input more comprehensible for English learners. Many techniques can help the students to comprehend the material in teaching and learning process. Based on Carr, Sexton and Lagunoff in their book with the title *Making Science Accessible for English Learners* argued that there are many classroom techniques have been found effective in lowering the language barrier and differentiating instruction for English learners. The classroom techniques are following below:¹⁹

¹⁷ Henderson, J., & Wellington, J. 1998. "Lowering the language barrier in learning and teaching science". *School Science Review*, vol 79 (288): 35 – 46.

¹⁸ Carr, J., Sexton, U., & Lagunoff, R. (2007). Teaching Science. In Making science accessible to English learners: A guidebook for teachers (p. 3-18). San Francisco: WestEd.

¹⁹ *Ibid*

a. Tapping into prior knowledge

There are many techniques that help the students to understand science texts which are explaining by using English language. Tap into prior knowledge means reminding the students by tapping or repeating their prior knowledge to give and confirm students' understanding to remember the material or knowledge about what they have learned. In the other side, guiding the students to access their prior knowledge and introducing key vocabulary are standard ways to engage the students in what they have read. Additionally, it helps minimization vocabulary and terms that students' are likely to hear.

b. Providing wait time after asking a question

The students have different ways in receiving the material or knowledge that they have learned. The students may take extra time to comprehend the process of back and forth about their primary language with English as the Medium of Instruction (EMI) which is implementing in teaching and learning process of subject matter. Provide wait time after asking a question means that it will give contribution to the students in order to give them more time to understand the questions, material, or knowledge itself. So, the students can grasp the material that they have learned correctly. Additionally, the teacher can use the textbook or texts which interspersed with pictures or illustration to help the students easy to understand while reading the books. Not only that, the teachers can give websites which provide the same concepts with the material that have learned to make the students read and comprehend the topic.

c. Giving instruction students to discuss

In teaching and learning process, discussing is appropriate to implemented as a technique which encourage the students to think deeply and widely. Some students learn better if they can share or discussing with their pair in small groups or small

group talks which can chance the students' language about repetition and practice better. The teachers are important role in teaching and learning process which guide the students to have discussing with their pair or team in the classroom to discuss about the relevant information or preview material that they have learned. Monitor each groups or student when they are discussing. The teacher should check the students' understanding about the material that they have discussed by asking some the students or groups to share the result of their discussing to others in the class. In the other hand, the teachers can divide the groups based on the primary language of students, English proficiency, knowledge of science, friendship, or other criteria which support to do it.

d. Using multimodal presentation

Other ways to make the students easy to understand the lesson and not bored, as professional teachers have to make and use creative and learning styles to engage and motivate the students easy to understood about the material. There are many styles which used in teaching and learning process such as accompanying oral presentations with visuals to help the students listen and focus to grasp the material with greater comprehension, giving the students note-taking outlines or sentence to help them understand the key concepts of the material, providing hands-on activities to make the students to see and know the concepts and procedures in teaching and learning process, presenting the pictures or realia as a media to make the students understand and also interest with the topic. In the other hand, it makes the students concentrate on the material, explaining the material carefully to make the students can grasp the information or material that they have learned.²⁰

²⁰ *Ibid*

e. Repeating and rephrasing important concepts

As the teacher, enactive the students' understanding is needed in teaching and learning process because by this way the teacher knows the students' thinking. Remind the students' mind by reviewing or questioning about the material or concept that have taught to make the students always remember their knowledge. Repeat and rephrase their knowledge like a reading briefly but high contextualized and also present the new words in the context of the lesson and emphasize each important key word and implement during the lesson. It can help the students to be able to always remember and understood the material and knowledge that have been taught.

f. Using standard and topic for the lesson

The teachers may use the same standard and topic of the lesson which appropriate with difficulty level and it aimed to give challenge to students without frustrating. There are many ways that the teachers do such as plan opportunities to review knowledge in simpler for the students, provide texts at different reading level which can develop the students' thinking. Ask the students to make small groups and choose one of the students who have the English proficiency to rephrase the concepts or knowledge that they have learned. So, by this way the students who are have less English proficiency it can helped by the students who have more English proficiency and understand the concept or material that they have learned.

D. Problems in Using EMI in Teaching Natural Science

Globalization era has demanded all people including teachers, students or children to be master in English as an International Language. In Indonesia, English is one of the subjects which learned from elementary school until in university level. In the other hand, the quality of education

must continue grow up to face the development of era. Many schools try to develop the quality with apply English as the main language in that school or called bilingual model which is using English language as foreign language to teach many subjects not only in English. The teachers demanded have good competence and good quality to be able teaches subject matter by using English as the Medium of Instruction (EMI) even though the teacher not graduated from English major. The implementation of English as the Medium of Instruction (EMI) in teaching subjects matter especially in Science subject cannot be separated from many problems that happened in teaching and learning process. The use of English as the Medium of Instruction (EMI) to teach others subjects in teaching and learning process will find problems. According to Gomez and Mata said that there are some problems affecting in teaching natural science subjects.²¹ The problems are following below:

1. Language Difficulties

Language difficulties is the main problems that can affecting in using English as the Medium of Instruction in teaching subject matter especially in teaching natural science subject. Because in natural science subject there are many everyday words have special meaning in science. Special meaning here means the words with has the same written in English or science but those are have different meaning or context. Additionally, the differences of vocabulary are also the problems in using English as the Medium of Instruction (EMI) especially in teaching natural science. The descriptions of problems the use of English as the Medium of Instruction (EMI) that can affect in teaching natural science are described below;

- a. Polysemous Words

A polysemous word is including the problems in teaching of natural science subject by using English as the Medium of Instruction (EMI). Polysemous words means words which have multiple meanings. When we

²¹ Gomez and Mata “*Vocabulary Instruction for ELL Students in the Middle School Science Classroom*”, *Voices from in the middle*, Vol.13, No. 1, 2005.

learn a science by using English as the Medium of Instruction (EMI) it found a vocabulary in English also is used in science but that vocabulary has different meaning with in English vocabulary. For example, the words *class* in English vocabulary means a room with many tools such as table, desk, which is used for teaching and learning process. In the other side, it is different meaning in science which is the words *class* means a group of animals, plants which has structures.

b. Different Vocabularies

As a teacher science who should teach that subject by using English as the Medium of Instruction (EMI) it is encourage that the teachers can covers and manages the students as ELL in the classroom. Actually, the language and concepts of science are often abstract.²² In the other hand, the students will find challenges when they learn language of science and the vocabulary of science. So, the teacher should cover and guide the students to pass those challenges.

Based on the explanation above, Gomez and Mata made the table below in order to help the readers easy to read and understand the differences the language between in English and science. The examples of those words are described below:

Table 2.1
Different Vocabularies in English and Natural Science²³

Words in Everyday Life	Words in Natural Science
Table	Periodic Table
Class	Animal Class
Translation	Translation in protein synthesis
Work	Work (Physics) force times the distance through which it acts
Power	Power (Physics) work done or energy transferred per unit of time
Kingdom	Animal kingdom

²² *Ibid*

²³ Gomez and Mata, "Vocabulary Instruction for ELL Students in the Middle School Science Classroom," *Voices from the Middle*, Volume 13, No. 1 September 2005.

2. Recognize specific words in a category

The next of problems that can be founded in teaching and learning natural science by using English as the Medium of Instruction is recognize specific words in a category. The teacher and students should recognize and understand about specific words that they find in teaching and learning science by using English as the Medium of Instruction. In this part, the words in science subject more difficult with the words in English. For example, the word “*bird*”. In English, they learn that word just in general category, but it is more difficult when they learn and recognize in specific category such as *robin*, *oriole*, *finch* and all the types of birds.

3. Text Analysis

Natural science subject is one of the subjects which have many texts. These texts make the learner or teachers are difficult in understanding the text well, because of the texts many uses of complex sentences which make the readers confused to understand the content that explained in the paper. In fact, many science texts have multiple diagrams to help the readers to understand the key concept of it. But, unfortunately the concept of diagram or graphics made complex.²⁴ There is an example of the text in science about “*Viral Infection*” obtained from Kenneth Miller. The example are describing below:

Table 2.2
Example of Text in Science Content²⁵

Viral Infection

Because viruses must bind precisely to protein on the cell surface and then use a host's genetic system, most viruses are highly specific to the cells they infect. Plant viruses do not infect animal cells; most animal viruses infect only certain species of animals; and bacterial viruses infect only certain types of bacteria.

Source: Kenneth Miller and Joseph Levine, *Biology*, Prentice Hall, 2003

²⁴ Kenneth Miller and Joseph Levine, *Biology*, Prentice Hall, 2003

²⁵ Kenneth Miller and Joseph Levine, *Biology*, Prentice Hall, 2003

Based on the text above, the content vocabulary of the text, the syntax of the text is complex and difficult to understand. The writer in the text above are making an argument which abstract and difficult to understand. So, the teachers have to understand deeply to know the key concept of the text before they share to the students, because if the teachers do not understand the concept it will make the students difficult to understand this text and for the next text. So, the students are able easy to understand the material of the subject.

E. Previous Study

There are several studies have investigated about the use of English as the Medium of Instruction. There are some previous studies with has similarity with this study below:

The first has written by Peter Hudson.²⁶ The second research has written by Amna Saaed, Tanveer Iqbal and Rabbia Azam.²⁷ Then, the third research has written by Hanadi Kadbey, Martina Dickson, and Melisa McMinn.²⁸ Three all of those researches above explain about teachers' perception toward the use of English as the Medium of Instruction. The first and second previous study focuses on teachers' perception about their preparation the use of English as the Medium of Instruction. While the third previous study focuses on teachers' perception of their challenges in using English as the Medium of Instruction.

The fourth has written by Jusuf Ibrahim.²⁹ The fifth has written by Liswani Simasiku, Choshi Kasanda and Talita

²⁶ Peter Hudson, "Learning to teach science using English as Medium of Instruction". Thesis. Queensland University of Technology. 2009.

²⁷ Amna Saaed, Tanveer Iqbal and Rabbia Azam. "Perceptions of Teachers regarding English-medium Instructions at Secondary Education in Punjab Province of Pakistan". Secondary Education Journal Volume 1, Issue 1 p. 41-53

²⁸ Hanadi Kadbey, Martina Dickson, and Melissa McMinn. 2015. "Primary Teachers' Perceived Challenges in Teaching Science in Abu Dhabi Public Schools". *Procedia - Social and Behavioral Sciences* vol. 186 p.749

²⁹ Jusuf Ibrahim, "The Implementation of EMI (English Medium Instruction) in Indonesian Universities: Its Opportunities, its Threats, its Problems, and its Possible Solutions". *Journal Universitas Kristen Petra Surabaya*, 2001

Smit.³⁰ Both studies investigated about the effectiveness of the implementation English as the Medium of Instruction. The fourth studies find out whether the implementation of English as the Medium of Instruction it can be effective to enhance the student or teacher language proficiency in universities which are applying bilingualism concept. While for fifth studies investigated about the implementation of English as the Medium of Instruction for teaching subject matter it can be negative effect and influence on students' participation in English lesson or not.

The sixth has written by Vuyokazi Sylvia Nomlomo.³¹ The focuses of this research is to compare the use of English and home language on that place which called isiXhosa in Science teaching and learning in intermediate phase (4 – 6 grades) in two primary school in Western Cape. In the other side, the researcher also finds out the effects of those two languages that are English and isiXhosa in teaching and learning especially in science. The result of this research show that the students and teachers who are using their home language (isiXhosa) has better communication, interaction, and more confidence rather than using English language in science teaching and learning.

The previous studies above more focus on the perception about the use of English as the Medium of Instruction (EMI) and then the other previous studies focus on comparing the use of English as the Medium of Instruction (EMI) with their mother tongue. While this research the researcher wants to conduct the research which focuses on investigating of teaching techniques by using English as the Medium of Instruction (EMI) in teaching science faced by the teachers. Not only have that, the researcher wants to know the teacher problems towards using English as the Medium of Instruction (EMI) in teaching subject matter especially in teaching natural science.

³⁰ Liswani Simasiku, Choshi Kasanda and Talita Smit. *“Teaching Subject Matter through English as the Medium of Instruction in the Namibian English Second Language Classroom”*. European Scientific Journal February 2015 edition vol.1 ISSN: 1857 – 7881

³¹ Vuyokazi Sylvia Nomlomo. *“Science Teaching and Learning through the Medium of English and Isixhosa”*. Thesis. University of the Western Cape. 20007

CHAPTER III

RESEARCH METHOD

This chapter presents the methodology of the research. It consist of research design, subject of the study, research location, researcher presence, data and source data, data collection technique, research instrument, data analysis technique, and research stages.

A. Research Design

In this research, the researcher used descriptive qualitative as the research design. The researcher implemented a qualitative research to find out the result of the research questions. According to Bogdan and Taylor stated that qualitative research is a research model which explains about the descriptive data in written or oral which obtain the information in natural setting to describe phenomena without manipulation.³² As stated before, the phenomenon is using English as the Medium of Instruction (EMI) in teaching natural science subject. In addition, this research tends to find out the teacher problems towards the use of English as the Medium of Instruction (EMI) in teaching and learning process especially in non-English subject.

B. Subject of the Study

The subjects of this study were the natural science teacher at MTs Bilingual NU Pucang Sidoarjo. There are twenty-five teachers who taught in MTs Bilingual NU Pucang Sidoarjo. However, the researcher just focused on natural science teacher who teach biology to obtain the data. The natural teacher who teaches biology is Mrs. F.

³² Moeleong, Lexy J, 2001. “*Metodologi Penelitian Kualitatif*”. PT Remaja Rosdakarya., Bandung

C. Research Location

In this research, the researcher conducted a research in seventh grades at MTs Bilingual NU Pucang Sidoarjo as a location. This school is located in Jl. Jenggolo No. 53 Pucang, Sidoarjo, and East Java 61219. The reason why of the researcher conducted a research in this school, because this school is a bilingual junior high school which using English as the Medium of Instruction in teaching and learning process. Additionally, the plus v: 21 this school has been worked together with Cambridge University, London. So, the teachers' competence and their quality have been challenging to teach the students especially in using English as The Medium of Instruction (EMI) when they teach subject matter.

D. Researcher Presence

In this research, the researcher presence was needed in doing this research. The role of the researcher was the collector of the data such as observer and interviewer of the participant that is the natural science teacher at MTs Bilingual NU Pucang Sidoarjo.

E. Data and Source Data

The researcher got the data from doing a classroom observation of the natural science teacher who teach by using English as The Medium of Instruction (EMI) in teaching and learning process to answer the first research question that is about what are the teacher's techniques when teach the students by using English as the Medium of Instruction (EMI) in teaching natural science subject especially in Biology subject and then the researcher continues an interview with the teacher to find the data about the teacher's problems when they use English as The Medium of Instruction (EMI) in teaching Biology subject at MTs Bilingual NU Pucang Sidoarjo.

F. Data Collection Technique

The techniques of collecting data in this research were observation, interview, and documentation about the teacher's technique and problems in using English as the Medium of Instruction (EMI) in teaching natural science. The steps of those three data collection techniques will be described below:

a) Observation

Observation is an activity to obtain the data or to see the target that will be observed by the observer. In this research, observation is the primary technique that the researcher used to collect the data. In this part, the researcher did an observation to collect the data about how the teacher's techniques in using English as the Medium of Instruction (EMI) in teaching natural science subject especially for Biology subject in teaching and learning process in the class.

The researcher observed the natural science teacher who taught Biology subject at MTs Bilingual NU Pucang Sidoarjo. The teacher is Mrs. F. In this part, the researcher observed the teacher when they taught natural science by using English as the Medium of Instruction (EMI) three times. The researcher did an observation before interview the teacher. The observation was conducted in seventh grades at the school. In this part, the researcher used an observation checklist to retell everything that happen in the class especially in how the teacher's technique to carry out the lesson by using English as the Medium of Instruction (EMI). In this observation, the researcher became a participant as an observer to obtain the data from the natural science teacher when they taught Biology subject by using English as the Medium of Instruction (EMI) to answer the first research question in this study. Participant as an observer means that the researcher did not contribution the activities in teaching and learning process in class, but the researcher just observed that happened in class. Additionally, the researcher had planned an observation

checklist to collect the data about the teacher's techniques in using English as The Medium of Instruction (EMI) in teaching natural science subject especially for Biology subject.

b) Interview

Based on a research of Moh.Nazir, he argued that interview is the investigation process to obtain information which does like dialogue face to face between the interviewer and the respondent.³³ In this research, the researcher used interview to support the data which obtained from the observation. The researcher used structured interview to collect the data. The researcher prepared and wrote the questions for interviewing the respondent. The researcher has found the data through interviewing of natural science teacher who taught Biology subject in that school to obtain more information about the implementation of English as the Medium of Instruction (EMI) in teaching subjects matter which is used in that school and how the non-English teacher faced when they demanded to teach their students by using English as the Medium of Instruction (EMI) in teaching subjects matter especially in natural science subject in this school. By this technique, the result expected to support the information in research question number one.

The interview has been done on October, 15th 2018. The researcher was conducting an interview with the respondent in the library, because in this place is not crowded and comfortable to do an interview. In this part, the researcher has already prepared several questions to interview the teacher which was related to how the teacher's problems and how the techniques to use English as the Medium of Instruction (EMI) in teaching natural science subject especially for Biology subject. The researcher interviewed the teacher directly once. But when the time was not enough to interview the natural

³³ Moh. Nazir, *Metode Penelitian* (Bogor: Ghalia Indonesia, 2005), page 193

science teacher, the researcher would continue the interview on the next day.

c) Documentation

The researcher used documentation to support in collecting the data for this research. In this research, the researcher used video when the teacher taught the students by using English as the Medium of Instruction, the audio recording from interviewing the teachers by the natural science teacher in Biology subject which would make the data valid to support this research. The researcher took a video when the teacher taught using English as the Medium of Instruction (EMI) in teaching Biology subject. The video would support the data when the researcher did an observation in seventh grade class. The researcher also recorded the answer from the teacher in interviewing process. It would become an evidence to support the result of the data.

G. Research Instrument

In this research, the instruments that the researcher used were observation checklist, interview guideline, and documentation. For further information, the researcher will describe an instrument below:

1. Observation Checklist

Observation checklist was used by the researcher to observe the teacher in the process of teaching and learning of natural science subject especially in Biology subject by using English as The Medium of Instruction. The observation checklist was made by the researcher itself which based on the theory from Carr J Sexton. In observation checklist, the researcher have six tables which contain some statements about how the teacher's techniques in using English as the Medium of Instruction (EMI) in explaining the material to make the students understand deeply, and what the techniques that teacher used to teach natural science in Biology subject by using English as the Medium of Instruction (EMI).

2. Interview Guideline

Interview guideline was used by the researcher to obtain the data from the natural science teacher about how the process of teaching natural science subject by using English as the Medium of Instruction (EMI). In this part, the researcher gave some questions for the natural science teachers in that school. The researcher used open-ended interview to collect the data. According to Creswell, open ended questions mean that the respondents' voice do not force by the researcher or the previous research findings.³⁴ The steps for interviewing were divided into two parts. The first part was asked for research question number one and the second was for research question number two. The total of the questions for first interview were twelve questions which made by the researcher from the theory of Gomez and Mata. The questions asked to the respondents were divided into three steps which are warming up, main, and closing. In the warming up, the researcher asked the teacher's role in that school and their background. It is written in interview guidelines on question number one until five. In the main step, consist of questions that are intended to find the answer of the research questions. This part has written in interview guidelines on question number six until twelve. For the closing step, the researcher closed the activity by saying thank you to the respondents. For the second step, the researcher had prepared six questions which were used to ask for research question number two in this thesis. In this part, the researcher focused on the teacher's difficulties when using English as the Medium of Instruction (EMI) in teaching natural science subject especially for Biology lesson. However, the questions that asked to the respondents were not absolutely same as the interview guidelines, because the interview guideline was in kind of semi structured. So, the questions may be abroad in the field but still in the

³⁴ John W Creswell, Educational research : Planning, Conducting and evaluating quantitative and qualitative research , (Boston library of congress cataloging in publication data 2012) 218

limitation if the data still need more information from the respondent. Additionally, the researcher also used tape recorder to record the interviewer's explanation during the process of interview.

3. Documentation

The aim of the documentation here is to obtain much information about the use of English as the Medium of Instruction (EMI) in the process of teaching natural science subject. In this research, the documentation included a video recording from the observation of the teacher when they taught natural science especially in Biology subject by using English as the Medium of Instruction (EMI) and an audio recording of the teacher when they were interviewed by the researcher about English as the Medium of Instruction (EMI) for answering research question number one and two. Furthermore, those teacher's video and audio from the interview would be helpful in this research.

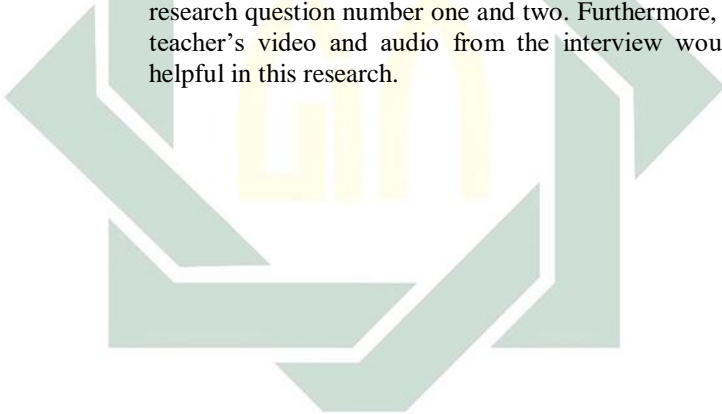


Table 3.1
Research Design

NO	RESEARCH QUESTION	LITERATURE	SUBJECT	DATA COLLECTION TECHNIQUE	INSTRUMENT
1.	What are the teacher's techniques in teaching natural science by using English as the Medium of Instruction (EMI)?	1. Carr, Sexton and Lagunoff	Natural Science Teachers	1. Observation 2. Documentation	1. Observation Checklist 2. Teacher's video, audio, and pictures
2.	What are the teacher problems in using English as the Medium of Instruction (EMI) in teaching natural science?	1. Gomez and Mata	Natural Science Teachers	1. Observation 2. Interview	1. Observation Checklist 2. Interview Guideline

H. Data Analysis Technique

This research used qualitative approach as the research design. The researcher conducted an observation, an interview, and documentation as the instruments. In this research, the researcher used Milles and Huberman model to analyze the data. The steps that be used in this research are described below:

a. Data Reduction

The first step was data reduction. It is the process of selecting, transcribing, and translating the data which is obtained from the field and then the data were noted, rechecked accurately and carefully. In this part, the researcher selected and categorized the data which obtained from the classroom observation in same theme and then transcribed the data from interview.

b. Data Display

In this part, the researcher organized and arranged the data has been selected from observation and interview. Then, the researcher display the data by describing the data through narrative text about how the teachers' technique in teaching natural science subject by using English as the Medium of Instruction and what the teachers' problems when they use English as the Medium of Instruction (EMI) in teaching subject matter.

c. Conclusion

In this part, the researcher concluded the result of the research in written form. The conclusion would give the answer based on the research question in this research.

CHAPTER IV

RESEARCH FINDING AND DISCUSSION

In this chapter, the researcher presented about the research finding and discussion. It reported the findings and results of data collection. Detailed description of the result obtained from this research was presented.

A. Research Finding

Based on the research problems stated in the first chapter, the research finding presented the result of the research based on the statement. Those were about the teacher techniques in teaching natural science subject by using English as the Medium of Instruction (EMI) and what the teacher's problems in using English as the Medium of Instruction (EMI) in teaching natural science subject at MTs Bilingual NU Pucang Sidoarjo are. These data were collected by the researcher during October, 1st 2018 until October, 8th 2018.

Based on research procedure and data collection technique, the data were collected by doing three times of classroom observation and once for **interviewing** teachers who teach natural science subject of 7th grade students at MTs Bilingual NU Pucang Sidoarjo. The first observation was conducting on Monday, October 1st 2018. The second observation was conducting on Thursday, October 3th 2018, and the last observation was conducting on Monday, October 8th 2018. For three times of observations, between the first observations with the others observation was not same. Because of the teacher continue the lesson that had been learned in previous teaching and learning process. So, not all of the techniques found at each meeting on the observation. As for interviewing process, the researcher conducted on Monday, October 8th 2018 after the observation process has done. From those instruments of collecting data, then the researcher described the findings to answer the research questions. The findings were described narratively as the following:

1. Teachers' Techniques in Using English as the Medium of Instruction (EMI) in Teaching Natural Science Subject.

In this section, the researcher would like to describes about the techniques that were used by the teacher when teach natural science subject by using English as The Medium of Instruction (EMI) in teaching and learning process. This research used some classroom techniques from a theory of Carr, Sexton and Lagunoff. They had classified teachers' techniques in using English as The Medium of Instruction (EMI) into six parts those are Tapping into prior knowledge, Providing wait time after asking a question, Giving students time to discuss, Repeating and rephrasing important concepts, and Using standard and topic for the lesson. To collect the data of teachers' techniques in teaching natural science subject by using English as The Medium of Instruction (EMI), the researcher used observation checklist as the instrument. Each types of techniques presented by an explanation about the result of observation.

In this part, the researcher observed the teacher when teach natural science subject by using English as The Medium of Instruction (EMI). During the observation, the researcher focused on the techniques that are used by the teacher when using English as The Medium of Instruction (EMI) in teaching and learning process and also the researcher wrote all the activities that related with those techniques. The result of the observation will be described below.

a. Tapping into prior knowledge

The result of the data on the observation showed that the teacher reminded and reviewed to the students about previous material that they had learnt. At the time, before the teacher began to explain the next material, the teacher reminded the students by reviewing the point of the previous material. When the researcher observed in the class, the teacher was reviewing previous chapter which talked about plants. At the time, the teacher reminded to the students for mention what the structures of the plants are. In the other side, the teacher also reminded to the students about the vocabularies or terms that the teacher explained in previous material. This activity supported evidence that the researcher saw there was a

conversation between teacher and students in teaching and learning process.

Teacher : **“Okay, today we will continue previous material about plants. Before I start explain more about the plant. Did you remember how many parts of plant?”**

Students : “The parts of plant are six those are Stem, Leaves, Root, Flower, Fruit, and Seed”.

Teacher : **“Okay, good. Do you remember which parts of plant categorized into main part and added part? Please, raise your hand”.**

Student : “Main parts of plant are Leaf, Root, and Stem. Added parts of plant are Seed, Fruit, and Flower”.

Based on the phenomenon above, it showed that the teacher was checking and remembering main topic about the previous material that they had learnt. So, the teacher knows about the students’ comprehending toward the lesson that they had learnt.

b. Providing wait time after asking a question

The result of the data showed that, after the teacher explained the material, the teacher gave an instruction for the students to understand about the material that they have received correctly. The researcher found this technique on the first and second meeting. On the first meeting, the teacher explained the material about root. And for second meeting, the teacher explained the material about flower. After that, the teacher asked some of the students to raise their hands and asked to the teacher if the students still do not understand about the material that had explained. In this part, the teacher re-explained again the material which combining by using Bahasa. Additionally, the teacher also wrote a note on the whiteboard in order to make the students easy to understand about the material. After that, the teacher gave some questions and chooses several students to answer those questions. The

teacher asked the students to answer randomly. In this section, the teacher gave one until three minutes for the students to thinking the answer before they answer teachers' question. If the students cannot answer the question, the teacher asked the others to answer the question. But in fact, when the teacher asked the students who have been appointed, there are some students who are busy and the class situation is crowded. So the teacher tried to keep the situation calm. She claps her hands as a sign to tell her students to be quiet and then she reduced the time only one minutes for thinking the answer.

In fact, the observer found this technique in two different meeting which the first technique, the teacher taught about kind of roots and for the second meeting, the teacher taught about the structures of flower. In the first meeting, the teacher just gave the time around one minute for the students to answer her question because in this condition the students very crowded. So, the teacher cut the time in order to make the students back in focus to the material. For the second meeting, the teacher gave the time around one until three minutes for the students to answer the question.

This technique aimed for the students to thinking and comprehending about the material that they have learned. So, the teacher knows about the students' ability to grasp the lesson. After that, the teachers asked the students wrote the entire important note in their note book in order to the students easier to re-read the material and easy to comprehend the material. This activity supported evidence that the researcher saw there was conversation between teacher and students in teaching and learning process.

The first meeting

Teacher : *"Hello, students. I will ask you about some question. Could you please explain the differences between fibrous root and tap root?"*(Teacher was giving time 1-3 minutes)

Student : *"Fibrous root has many branches and it is small. But for Tap root has strong main root".*

*Teacher : “Okay, good. How about the seed both of roots? **Anyone wants to answer?**”. (Teacher was giving time 1-3 minutes)*

Student : “Actually, monocotyledon plant has fibrous root and dicotyledon has tap root”.

*Teacher : “Good, **Could you please give the example of plants which categorized has fibrous root and tap root?**”.*

Student : “The example plants of fibrous root are Paddy and Grass. And the example plants of tap root are Coconut tree, Guava and Mango”.

*Teacher : “Thank you. How about the coconut tree? **Anyone else want to answer?**”*

Other student : “No, Coconut tree categorized in fibrous root, Miss”.

Teacher : “Yes, good. Coconut tree are categorized into plants that have fibrous root. Remember please, not all of the big plants are categorized in tap root. Let’s we see that coconut tree doesn’t has branch in their stem. So, it is characteristic of monocotyledon. As we know that monocotyledon has fibrous root.

The second meeting

*Teacher : “After you know about the structures of flower. **Now, I want to ask you about what are the functions of flower that you know. Please rise your hand and mention it !**”. (Teacher was giving around 2 minutes).*

Students : "I am, Miss. The function of flower is as reproduction".

Teacher : "Any others?".

Students : "The flower can produce nectar".

c. Giving instruction students to discuss

In this part, the researcher found that the teacher used this technique twice. It presented in the first meeting and second meeting. For the first meeting, the teacher explained the material about root and for the second meeting, the teacher explained about flower. In this part, the teacher has similar activity when asked the students to discuss with their pair in first and second meeting. Based on the result of the observation, after the teacher had explained the material about root, the teacher asked the students to discuss with their pair about the relevant information or preview the material that the students have been learned. The teacher asked the students to discuss about the structures of root and compare the characteristic of root. The data described below

The first meeting

Teacher : "Okay, if there is no question. I ask you to discuss with your pair about the function of root and please compare the characteristics of root. And please give the example and categorize of plants based on the characteristic of root! You can discuss with your desk mate".

For the second meeting, the teacher asked the students to discuss about parts and the differences between perfect flower and imperfect flower. In the observation, the teacher did not divided the students into some groups in order to make the students easy when they are discussing with their pair, but the student just sat down on the desk with their desk mate. Here, the process of discussion just with the students' pair in the desk not in group. Although the classroom arrangement likes

that, the teacher still asked the students to discuss and present their answer to the others students in the classroom. Before the teacher asked the students to present, the teacher monitored several students when they were discussing. The teacher was walking for the students to check about their discussion. After the teacher monitored the students, the teacher chooses several students randomly to present the result of their discussion in front of the class. The students was explaining the result and the others students pay attention to the students who are presenting in front of the class. This activity supported evidence that the researcher saw there was a conversation between teacher and students in teaching and learning process. It is described below:

The second meeting

Teacher : “Yesterday, we had discussed about the function of root. Now, Before I continue the material. Now, I want you to discuss about the parts of flower and also please discuss about the differences between perfect flower and imperfect flower”.

Based on the phenomenon above, some of students faced difficulties when they were discussing. Maybe both of the students still don't understand about the material. It is better if the teacher divided the students into several groups to discuss. By this way, the students can change their opinion with the others friends. So, the students can learn and solve the problems on the tasks together and easier.

d. Using multimodal presentation

Based on the result of the observation, the teacher explained the material to the students about plants. In this part, the teacher was explaining the material about leaf. The researcher found this activity on the second observation. At that time, the teacher used realia to explain the material for the students. The teacher brought a leaf as a realia and it used when the teacher explained about the parts of leaf. In the observation, the teacher was drawing pictures on the white board when explaining the material to the students. In the other side, the teachers also wrote some note in order to make

the students easy to remember the vocabularies of the material. Additionally, in this school has *matrix book*. It is a natural science dictionary which contains vocabularies that related with students book. The teacher and students used *matrix book* to help the students or teacher to find the meaning of the vocabularies especially in natural science subject. So, it makes the students easy to find out about the meaning of the vocabularies on the material or on the students book. Based on the activity above, the teacher used multimodal presentation such as using realia, drawing pictures and the teacher giving note to the students in order to make the students easy to comprehending the material. The following instruction has described above.

*Teacher : “**Okay students, I have a leaf. Please, look at this. Let’s we learn about the parts of leaf.** The parts of leaf are Tip, Midrib, Margin, Petiole, Vein, and Lamina”. Those are the parts of leaf. You can see your book and matrix book to know the meaning of those vocabularies”.*

Students : “Yes, Miss”.

*Teacher : “Have you finished read and understand the parts of leaf. **Please, look at the whiteboard!** Next I will ask you to mention the name parts of leaf which show by this line”.*

e. Repeating and rephrasing important concepts

Based on the observation, before the teacher finished the teaching and learning process, the teacher repeated the material and also pushed the important material that had explained to the students. The researcher found this technique in the first observation when the teaching and learning will be finished. At that time, the teacher was repeating the material which talked about root. The teacher also presented again about the new words or vocabularies in the context of the lesson in order to make the students always remember about

the material that they have been learned. The activity about this point will be described below:

Teacher : **“Do you remember what the same parts of root? What is the name of lower part?”**

Student : “The lower part is of cap root”

Teacher : “Yes, or we can called Calyptra. And then, what is the the top zone of meristem zone?”

Student : “Elongation zone, Miss”.

Teacher : **“Good, based on the name, what is the function of elongation zone?”. Based on the word long it means?**

Student : “The longest zone, Miss”.

Teacher : “Elongation zone is a zone which has the function is active to extend the roots. How about the function of phloem? Based on the word phlo it means?”

Student : “The function of Phloem is to carry photosynthesis products to the others components”.

The teacher gave underlined on the word “Long” in “Elongation” word and also the word “Phloem” and “Photosynthesis” to make the students easy to remember the function about it.

Elongation to long or extend the root

Photosynthesis Phloem

The key word was the alphabet of *Long* and *Pho*. Here, by give an underlined on that alphabet it could make the

students easy to remember the function of *Elongation zone* and *Phloem*.

f. Using standard and topic for the lesson

The result of the observation showed that chapter of the lesson which learned by the student is appropriate on the standard level of the students and also the topic was suitable for the students in their grade. In fact, at MTs Bilingual NU Pucang, the teachers each subject lesson make a book together which used to teach the students. So, all of the teachers has similar vocabularies to teach their students. So, it did not make the students feel challenging to learn natural science subject by using English as The Medium of Instruction (EMI). Because of the topic of the lesson is suitable with the level of the students. Additionally, based on the observation, the teacher explained the material about plants. The teacher explained the material in simple ways and gave a bold for the important material. In the other side, the teacher sometimes combined with Bahasa in order to make all of the students understand about the material that had been learned. After that, the teacher asked the students randomly to answer the question about the material that had been learned. So, by this way, the teacher knew students' understanding about the material that had been explained in the classroom. This activity showed between the teacher and students in teaching and learning process at the observation on second meeting. It will be transcript below:

Teacher : *“Okay, I will ask the students who sit number two from the back. Could you please, mention and write on the whiteboard what kind components of flower?”*

Student : *“There are Stalk, Sepal, Petal, Stamen, Calyx, Stigma, and Ovary.*

Table 4.1
Common English as the Medium of Instruction Expression

No	Technique	Observation 1	Observation 2	Observation 3
1.	Tapping into prior knowledge	<p>Today, we will continue about the previous material</p> <p>Before, I start explain the material, did you remember about</p>	-	-
2.	Providing wait time after asking a question	<p>I will ask you about some question</p> <p>Could you please give the example of ...?</p> <p>Anyone else want to answer? I give you two minutes</p>	Now, I have question for you.	-
3.	Giving instruction students to discuss	<p>I ask you to discuss with your pair about</p> <p>Could you please discuss with your friend?</p>	Now, I want you discuss this material	-

4.	Using multimodal presentation	-	Look at the whiteboard, please! Here, I have	-
5.	Repeating and rephrasing important concepts	Do you remember about? What is the function of ...?	-	-
6.	Using standard and topic for the lesson	-	-	Could you please mention about the part of Can you write your answer on the whiteboard?

Based on the table above, it's shown about common expressions which found by the researcher when conducting this research. From the six classroom techniques based on Carr Sexton and Lagunoff almost all of the techniques founded in the field. The teacher used some expressions of English as the Medium of Instruction for communication with her students in teaching and learning process. For example on the first technique that is tapping into prior knowledge. In this technique, the teacher tried to remind for the students about the material that had been learnt on the previous material. The used of English as the Medium of Instruction was found on the first observation. The expression that the teacher used such as *"before I explain the*

material, did you remember about the previous material?" It can be make an expression of English as the Medium of Instruction for reminding and reviewing the previous material for the students in teaching and learning process.

2. Teacher Problems in Using English as the Medium of Instruction in Teaching Natural Science Subject

In this section, the researcher presented the teacher problems in using English as the Medium of Instruction (EMI) in teaching natural science subject at MTs Bilingual NU Pucang Sidoarjo which were obtained from the interview with the teacher who teach natural science subject in that school. In this part focused on some problems in using English as The Medium of Instruction (EMI) in teaching natural science subject by Gomez and Matta theory. The result of the research found some points related to the teacher's problems in using English as the Medium of Instruction (EMI) in teaching natural science subject.

Regarding on the interview toward the teachers, there were so many information guided. There were two parts questions that was given by researcher to the teacher. The first part focused about teacher's background and experience. The second part talked about teacher's problems in using English as The Medium of Instruction (EMI) in teaching natural science subject. Some of question was limited on the teacher's problems in using English as The Medium of Instruction (EMI) in teaching natural science subject. The interview's questions were given from the general to the specific topic, which talk about the problems faced by the teacher in using English as The Medium of Instruction (EMI) in teaching natural science subject.

On the part one was talked about teacher's background and experience in teaching natural science subject by using English as The Medium of Instruction (EMI). The data showed that, the natural science teacher in that school was graduated from Biology major. The teacher had experience below five years in using English as The Medium of Instruction (EMI).

On the part two, the first and the second question talked about teacher's experience in learning English. According to the result of the interview, the natural science teacher had experience in

learning English. The teacher stated that they got English lesson in the school, but the teacher also joined English course to improve their ability in English. Even though the teachers had joined English course, they argued that they felt difficult when they taught subject matter especially natural science by using English as the Medium of Instruction (EMI).

The third and fourth question, the researcher asked about “How do you feel when teaching natural science subject by using English as The Medium of Instruction (EMI)?” the teachers answered “yes, feel difficult”. The teacher stated that she felt difficult because she did not come from international Biology education program. Additionally, the teacher explained that not all of the students understand and sometimes couldn’t accept her explanation well. She might think hard to make simple word or statement in order to make the students understand about the material of natural science subject. So, she should learn more about some vocabularies in natural science subject. If the teacher felt that the students feel confused, she combines the language by using English and Bahasa.

The fifth and sixth question talked about “Do you have problems when using English as The Medium of Instruction in teaching natural science subject?”. The teacher answered yes. And then, the researcher asked to explain what the teacher’s problems in using English as the Medium of Instruction (EMI). The teacher answered that they have problems when explained the material and sometimes the students didn’t directly understand about the material. So, the teacher might explain more than once and sometimes explain by using Bahasa. Such on Car Sexton and Lagunoff theory which is categorizing this condition in a technique that is providing wait time after asking a question. This problem founded when the researcher did an observation in the class. It showed that the students didn’t directly understand about the material. This activity showed in short conversation below:

Teacher : “Could you please explain the differences between fibrous root and tap root?”. “(Anak – anak, apakah kalian tahu apa perbedaan dari akar tunggang dan akar serabut?”.

Student : “Fibrous root has many branches and it is small. But for Tap root has strong main root”.

Teacher : “Yes good. Perbedaan dari akar tunggang dan akar serabut dapat kita amati bentuk akarnya. Dimana akar serabut memiliki batang ruas kecil – kecil dan banyak. Disisi lain, akar serabut tidak sekuat akar tunggang. “Next question, How about the seed both of roots? Anyone wants to answer?”.

Student : “Actually, monocotyledon plant has fibrous root and dicotyledon has tap root”.

Teacher : “Good, Could you please give the example of plants which categorized has fibrous root and tap root?”.

Student : “The example plants of fibrous root are Paddy and Grass. And the example plants of tap root are Guava and Mango”.

Teacher : “Yah kita ingat bahwa ciri – ciri dari akar serabut adalah jumlah akarnya kecil dengan panjang yang sama dan bergerombol banyak, biasanya akar serabut tumbuhnya pada bagian pangkal batang. Sedangkan akar tunggang biasanya dimiliki oleh tumbuhan berkeping dua. Ciri – ciri akar tunggang yaitu akarnya keras dan kuat menopang tumbuhan”.

As we know on the data above, it is show that after the teacher asked the students, she explained the material by combining using English and Bahasa. So, by this way, the teacher can ensure about the students’ comprehending on the material that they have learned.

The seventh question, the researcher asked the teacher to circle the statement on the question that ever faced these problems when the teachers teach natural science subject by using English as

the Medium of Instruction (EMI). There three options, those are (a) Language difficulties which categorized about polysemous word and different vocabularies, (b) Recognize specific words in a category, and (c) Text analysis. In this part, the teacher faced the problems in language difficulties, recognize specific words in a category and text analysis.

The eighth question talked about “How is your opinion about the language or vocabularies in English and in natural science subject?” the teacher said that the vocabularies in English and natural science had many differences. For example the word “*Stem*” in English the meaning is “*batang*”. But in natural science the word “*Stem*” the meaning is *Jaringan*. The word “*heart*” in English the meaning is “*hati*” but in natural science the word “*heart*” has the meaning “*jantung*” and the word “*hati*” in natural science is “*Liver*”. Another example, the word “*Stomach*” in English means “*perut*” but in natural science the word “*stomach*” means “*lambung*” and the word “*perut*” in natural science is “*Abdomen*”.

The ninth question talked about “How is your opinion when you find specific words in natural science subject?” The teacher answered same with the eighth question that almost has different meaning in English vocabularies. So, the teacher should give the explanation in natural science and English to minimize the students’ misunderstanding in comprehending the material of the lesson. Additionally, the teacher said that few words in natural science were complicated and it’s not affect with the English vocabularies because sometimes specific words have different meaning.

The tenth question talked about “Do you find difficulties to understand the content of the text? How about the words selection and the arrangement of sentences in the texts? Do you sometimes feel difficult when you got problems like that?” The teachers answered “yes, sometimes found that problems”. The teacher said that sometimes she directly looking for the meaning in the dictionary when she felt difficult to understand the content of the texts and sometimes she found that problems when she tried to understand international journal, because she said that the vocabularies and the arrangement words in natural science are more complex.

The eleventh question talked about “are your students can understand easily on the subject that have learned even though it uses English language in teaching and learning process?” The teacher said that the students cannot easily to understand the material, because in fact the students have limitation in English language. So, the teacher should repeat the material and give the students exercise to make the students more understand about the material. In the other side, the teacher said that almost all of the students never learned natural science in English especially like the seventh grade students who they still in transition stage from elementary school to junior high school. So, they still adaptation with this regulation which is implementing English as the Medium of Instruction for teaching subject matter. Moreover, almost all of the students have low English ability and they only have few vocabularies and of course it made them difficult to understand about the material. Additionally, the students should understand the meaning and then they tried to understand the material.

The twelfth question talked about “What are the techniques that you use to overcome your problems in using English as The Medium of Instruction (EMI) in teaching natural science subject?” The teacher said that she used discussion technique and makes chart, scheme or picture to make the students’ easier to understand about the material and sometimes she had written some key words on the whiteboard to make the students easy to remember about the vocabularies that they have learned on the material. Sometimes, the teacher also explains the material by using simple word or statements in English language in order to make the students could understand easily about the material. Additionally, she also explained the material first and then continued with discussion about some case or giving the students some questions that related on the chapter that they have learned. This data of this interview founded in an observation. Sometimes, the teacher used a *Matrix book* to explain the material for the students in order to make the students can easy to understand the material and know the meaning of the words or vocabularies. The data will be described below:

Teacher : “Okay students, I have a leaf. Let’s we learn about the parts of leaf. The parts of leaf are Tip, Midrib, Margin, Petiole, Vein, and Lamina”.

Those are the parts of leaf. You can see your book and matrix book to know the meaning of those vocabularies”.

Students : “Yes, Miss”.

Teacher : “Have you finished read and understand the parts of leaf. Next I will ask you to mention the name parts of leaf which I show to you!” (Show the leaf to the student).

So, by this way, it can help the teacher when explaining the material for the students. In the other side, the students know the meaning of the vocabularies and they more understand toward the material that they have learned.

B. Discussion

This section presented the discussion of the research findings. In this research, there are two research question proposed in the research study. In this section, the researcher focused on the finding two of research questions, those are what are the teachers’ technique in teaching natural science by using English as the Medium of Instruction (EMI) and what are the teachers’ problems in using English as the Medium of Instruction (EMI) in teaching natural science subject.

Based on the research question on number one is about teachers’ technique in using English as the Medium of Instruction (EMI) in teaching natural science subject. The researcher had provided the data of techniques that the teachers used in using English as The Medium of Instruction (EMI) in teaching natural science subject. In the other side, the research question for number two, the researcher had provided the data based on kinds of teachers’ problems in using English as The Medium of Instruction among in the process of teaching and learning process. The data of discussion will be presented by analyzing and supporting the theory before.

1. Teachers' Technique in Using English as the Medium of Instruction (EMI)

According to the data of research finding, the researcher showed that the teachers' technique in teaching natural science subject by using English as the Medium of Instruction (EMI). It could be seen that the entire points of the techniques classroom by Car, Sexton, and Lagunoff theory had been used by the teachers when implementing English as The Medium of Instruction (EMI) in teaching natural science subject in the classroom. As for the explanation will be described below:

a. Tapping into prior knowledge

The first technique that the teacher used was tap into prior knowledge. Basically this technique helped the students to remember what the material that have been learned. It gave the teachers know the students' understanding about the previous material. It understood well or not by the students. Tap into prior knowledge it could be described as reminding the students by tapping or repeating their prior knowledge which has the aim to know about students' understanding about the material that they have learned. According to the result of the data showed that the teachers in MTs Bilingual NU Pucang Sidoarjo had done this technique in teaching and learning process. The teacher tried to remind and repeat the previous material that they have learned which related to the next material that would explain. Not only that, the teacher also reminded about the vocabularies or terms in natural science subject because the teachers said that the students sometimes difficult to remember about the vocabularies or terms in natural science. According to the finding, the teacher reminded the students about the previous material which talked about plants. The teacher used some expressions of English as the Medium of Instruction those are; (1) today we will continue about the previous material, (2) did you remember about the previous material. It was line with the statement of Carr that it can guide the students to remember their prior knowledge and it is standard way to engage the

students in what they have learned.³⁵ So, by this technique it could help the teachers to monitor the students' understanding about the previous material by reminding and reviewing the material before the teacher continues to the next material.

b. Providing wait time after asking a question

The second technique was providing wait time after asking a question. In fact, the students' ability to understand what the teacher explained is different between the students to other students. Carr, Sexton, and Lagunoff argued that the student may take an extra time to comprehend about the process of back and forth about their primary language with English as the Medium of Instruction (EMI) which is applying in teaching and learning subject matter especially in teaching natural science subject.³⁶ This reason is founded by the researcher when conducted observation in the classroom, there were students who asked the teacher to explain again because they did not understand about the material. Based on the data, it showed that the teacher gave a space time to the students after they explained the material. The teacher used that time to make sure that the students can grasp the material that they have learned. Besides that, in that time the teacher asked some questions about the material to know the students' understanding about the material. Based on the finding, the teacher gave a space time after she gave a question for the students. Here are the expressions of the English as the Medium of Instruction that the teacher used those are; (1) I will ask you some question, (2). Anyone else to answer this question, I will give you two minutes. It is in line with Carr that the students have different ways in receiving the material or knowledge

³⁵ Carr, J., Sexton, U., & Lagunoff, R. (2007). Teaching Science. In Making science accessible to English learners: A guidebook for teachers (p. 3-18). San Francisco: WestEd.

³⁶ Carr, J., Sexton, U., & Lagunoff, R. (2007). Teaching Science. In Making science accessible to English learners: A guidebook for teachers (p. 3-18). San Francisco: WestEd.

that they have learned.³⁷ So, the teacher should give a space time for the students to think about the answer of the question. Additionally, Henderson argued that the teachers provided some tasks, questions to the students it had the goal to learn as much as possible about what the students have understand or have not understand about the natural science material that explained by the teacher. So, the teacher could know about the students' understanding about the material.

c. Giving instruction students to discuss

The third technique was giving students to discuss. Discussing is appropriate to applied in teaching and learning process. By discussing, the students can share their opinion or knowledge to the others students. According to the result of the data, presented that the teacher had asked the students to discuss with their pair about the relevant information or preview material that is explained by the teacher. This activity related to the statement on the previous theory. In this part, the researcher also observed the teacher about monitoring the students when discussing with their pair. The teacher asked the students to discuss about the material that had been learned. In this part, the teacher used some expression of English as the Medium of Instruction such as (1) I ask you to discuss about, (2) Could you please discuss with your friend. After that, the teacher continued asked the students to present and shared the result of the discussion to the others. This result has similarity with the theory of Carr. In the theory, Carr argued that the teacher should monitor the students when they are discussing.³⁸ Because of that the teacher can controls and knows if the students have difficulties or maybe confused in discussing process. So, the teacher can gives explanation more for the students.

d. Using multimodal presentation

The fourth technique that used was use multimodal presentation. This technique has the aim to make the students easy to understand the lesson and not bored in teaching and

³⁷Carr, J., Sexton, U., & Lagunoff, R. (2007). Teaching Science. In Making science accessible to English learners: A guidebook for teachers (p. 3-18). San Francisco: WestEd.

³⁸ *Ibid*

learning process. In the other hand, it can make the students concentrate on the material. During observation, the researcher had two points to observe this technique. The first point focused on teachers' learning style to engage the students to comprehend the material in order to make the teaching more innovative and not bored and for the second point focused on the use of multimodal presentation such as visual, word wall, chart, picture, realia, or experiment during direct instruction, summarizing, or reviewing the material. For the first observation, the researcher did not found this technique because in that time the teacher taught the students in direct teaching style which the teacher directs explain the material and students paid attention to the teacher. She just focused to review the previous material and explain the new material by open the book and write some note on the whiteboard. For the second observation, the result of the first and second point above showed that the teacher had done use this technique. In this part, the teacher explains about the plants. The teacher brought a leaf as realia to show for the students in order to make them easy to understand about the parts of leaf. In the other side, the teacher also drew a picture in whiteboard. At that time, the teacher explained about parts of flowers. According to the finding, the teacher used expression of English as the Medium of Instruction for teaching the students. Here, the expression that the teacher used such as (1) Look at the whiteboard, please, (2) Here, I have a leaf. So, the students could easy to understand about the material because the teacher explained focused not only on the textbook but also the material in detail like by using realia, picture or word wall.

According to Car theory also argued that the use of multimodal presentation such as visual, world wall, picture, or chart can help the students grasp the information or material that they have received in detail and not make them bored during the teaching and learning process.

e. Repeating and rephrasing important concepts

The fifth technique that used was repeating and rephrasing important concepts. Checking students' understanding is important for the teacher. Because the

success of teaching is the students understand about what the material that they have learned. Even though, sometimes there are students who have low ability to understand the lesson. But, it makes the teacher more challenging because of the teacher should check the condition of the students. So, that's why checking the students' understanding on the material is needed. In this technique, the researcher observed about the teacher in repeating and rephrasing the material that has explained and about the teacher emphasizes important key words of the material. The result both of those points had done by teacher during observation. The teacher repeated the material and presented new words or vocabularies that explained. And then the teacher explained the material by giving some key words to make the students are able easy to remember and understood the material. According to the finding, in this part the teacher used some expressions of English as the Medium of Instruction for the students those are (1) do you remember about, (2) What is the function of. It is line with Carr in his theory, he argued that introducing the key words when explain the material are emphasize the students in understood in what they are learn.³⁹

f. Using standard and topic for the lesson.

The sixth technique that used was using of standard and topic for the lesson. In this technique the researcher had three points to observe the teacher. The first point observed the use of same standard and topic of the lesson which aimed to give challenge to the students without make the students frustrating. The result of observation presented that the teacher had done this technique in learning process. During observation, the teacher used standard topic of the lesson which is suitable that give for the students in their level. At the time, the teacher taught about plants. The result of the data supported with the previous study done by Hanadi Kadbey, Martina Dickson, and Melissa that argued there are a lot of attention that should be given to the relevance outcomes and suitability the context of material in the level of students. If

³⁹ Carr, J., Sexton, U., & Lagunoff, R. (2007). Teaching Science. In Making science accessible to English learners: A guidebook for teachers (p. 3-18). San Francisco: WestEd.

the context of the lesson are not suitable with the level of the students, it can be challenging and feel frustrating for the students. The second point about the teacher creates plan opportunities to review the material in simple ways for the students. The researcher found this technique on the third observation which the teacher was reviewing the point of the material that before the teacher gave tasks for the students. Based on the finding, the teacher used expressions of English as the Medium of Instruction such as (1) Could you please mention about the part of, (2) Can you write your answer on the whiteboard. The third point observed about the teacher asked the students who have good English proficiency to rephrase the main point of the material that have learned. The result of the data showed that the teacher hadn't done this point. This situation supported from the result of the interview, the teacher argued that the students' ability in English still low. Because the students still in seventh grade in that school. So, the students still adaptation with the style in teaching and learning process which is using English as the Medium of Instruction for teaching subject matter especially in natural science subject. In the other hand, the teacher stated that the students still lack of the vocabularies. So, that's why the teacher did not ask the students who have good English proficiency to review the material and explain for the others. In this part, the teacher just asked some of students randomly to present what the material that they had received. It is different with Carr's statement which argued that the students who have good English proficiency can help the others students who have lack of English proficiency.⁴⁰ Based on the reason, the researcher thought that the teacher wants all of the students understand about the material not even just on the students who have good in English proficiency. Even though it's different with Carr's theory, the previous study done by Liswani Simasiku, Choshi Kasanda, and Talita Smit support the result of this research. On their researcher showed that English Second Language (ESL) teachers argued that there is

⁴⁰ Carr, J., Sexton, U., & Lagunoff, R. (2007). Teaching Science. In Making science accessible to English learners: A guidebook for teachers (p. 3-18). San Francisco: WestEd.

negative impact of the use English as the Medium of Instruction which it can influence on students' participation in English lesson. They argued that the use of English as the Medium of Instruction makes the students' who have low in English proficiency difficult to grasp the material of the lesson, because of they have to understand the material and also they should have good English proficiency.

After described about teachers' technique that used in teaching natural science by using English as The Medium of Instruction (EMI), it was found that the techniques which related with Carr, Sexton, and Lagunoff theory that the teachers used were tapping into prior knowledge, providing wait time after asking a question, giving instruction students to discuss, using multimodal presentation, repeating and rephrasing important concepts, and using standard and topic for the lesson.

2. Problems in using English as The Medium of Instruction (EMI) in Teaching Natural Science

In conducting bilingual program, all of the teachers who involved were required to use English as the Medium of Instruction (EMI) in teaching and learning process. In fact, it was not easy to apply English as the Medium of Instruction (EMI) fully in teaching subject matter especially natural science subject. Because natural science teachers still has low ability in using English and in the other, the students also have low ability in understanding the material which is delivered by using English. So, that's why there were many problems that are faced by the teachers in using English as The Medium of Instruction (EMI) in teaching natural science subject.

In this part related with the research question number two in this research that is to find out whether teachers in MTs Bilingual NU Pucang Sidoarjo has the problems in teaching natural science by using English as The Medium of Instruction (EMI). It can be seen that the teacher has the problems almost in all of the aspects such as Gomez and Mata in their theory those are language difficulties, recognize the specific words,

and text analysis.⁴¹ The problems that are faced by the teachers would be discussed below:

a. Language Difficulties

Actually, language difficulties is the main problems that can affecting in using English as the Medium of Instruction (EMI) in teaching subject matter especially in teaching natural science subject. The result based on the interview showed that the teacher had some problems about language difficulties when they use English as the Medium of Instruction (EMI) in teaching natural science subject. Those problems were divided in polysemous word and different vocabularies. Gomez argued that polysemous word means words which have multiple meanings.⁴² The use of English as the Medium of Instruction (EMI) especially in teaching natural science subject would find many polysemous words. Because the vocabularies in English and in natural science subject almost has many differentt meaning. The result of the data showed that the teachers gave some example of polysemous words. For example will be described below:

The word “*Stomach*” in English has the meaning “*Perut*”. But, in natural science, the word “*Stomach*” has the meaning “*Lambung*”.

The next part is about different vocabularies. In implementing English as The Medium of Instruction in teaching natural science, it encouraged the teacher to have good ability in using English. So, the teacher should learn more about some vocabularies in natural science subject because of vocabularies in English and natural science subject sometimes has differences in meaning or in the words. The use of English as the Medium of Instruction (EMI) in teaching natural science subject made a challenging for the teacher who teaches that subject. Because the teacher did not come from English major, but she are demanded to teach that subject matter by using English as the Medium of Instruction (EMI). Based on the result of interview, the teacher argued that she has challenge

⁴¹ Gomez and Mata “*Vocabulary Instruction for ELL Students in the Middle School Science Classroom*”, Voices from in the middle, Vol. 13, No. 1, 2005.

⁴² *Ibid*

when she found some of students do not understand what the material that explained. It is line with Gomez and Mata statement that the language and concepts in natural science are often abstract.⁴³ Here, the result of the data based on the interview which showed the problems in different vocabularies. For example is the word “*Stem*” in English means “*Batang*”, but in natural science the word “*Stem*” means “*Jaringan*”. That is an example that showed the differences of vocabularies between in natural science and English. So, it made the teacher should cover and explain twice in English and Bahasa in order to make the students understand about the material.

b. Recognize specific words in a category

The second problem is recognizing specific words in a category. The result of the data showed that the teacher faced difficulties when they found specific words in natural science subject. In teaching and learning natural science subject by using English as The Medium of Instruction (EMI) almost found few words in natural science subject. It is known that the words in natural science subject more difficult than with the words in English. Additionally, the teacher argued that few words in natural science were complicated than in English vocabularies. It is related with the Peter Hudson’s statement on previous study in this research. In his research, Peter said that teachers lack of learn many terms in natural science subject. For example, the word “*Flower*” in English vocabularies sometimes many people learn about that word in general. But, in natural science vocabularies must be learn and recognize the word in specific category such as Lotus, Orchid, and Bougainville. So, the teachers should explain more specific the meaning in natural science subject to minimize students’ miss understanding. In the other side, the teacher also used *Matrix Book* (a dictionary which contains natural science vocabularies) for the students in order to make the students easy to understand and also it could make the students easy to remember about natural science vocabularies.

⁴³ Gomez and Mata “*Vocabulary Instruction for ELL Students in the Middle School Science Classroom*”, *Voices from in the middle*, Vol. 13, No. 1, 2005.

c. Text Analysis

The next problem is about text analysis. As we know that, natural science subject is one of the subjects which have many texts. Sometimes, the texts are difficult to understand because the arrangement the words or vocabularies. It is line with Kenneth's statement that the texts more complex and too dense syntactically for teachers and students negotiate.⁴⁴ Based on the result of the data, the teacher had some difficulties on text analysis when they taught natural science subject by using English as The Medium of Instruction (EMI) in teaching and learning process. The reason showed that the teacher feel difficult if they find some texts which the arrangement of the words and sentences were complicated, and also the vocabularies difficult to understand.

⁴⁴ Kenneth Miller and Joseph, Biology, Pentrice Hall, 2003

CHAPTER V

CONCLUSION AND SUGGESTION

This chapter is divided into two parts that are conclusion and discussion. Based on the findings and discussion on previous chapter, the researcher made some conclusion of teacher technique in teaching natural science subject by using English as the Medium of Instruction (EMI) and about teacher problems when using English as the Medium of Instruction (EMI) in teaching natural science subject.

A. Conclusion

According to the research finding on the previous chapter, the researcher provided some conclusion in this research. The conclusion will be described below:

1. The result of the data showed that, techniques used by the teacher in using English as The Medium of Instruction (EMI) in teaching natural science subject that found in this research are: (1) tapping into prior knowledge by reminding and reviewing the point of the previous material, (2) providing wait time after asking a question by giving a space time to ask some questions for the students, (3) giving instruction to students to discuss in pair about information related to the materials, (4) using multimodal presentation by implementing the creative learning by bringing a leaf as a realia and drawing a picture, (5) repeating and rephrasing important concepts by checking students' understanding on the material and repeating about new words or vocabularies that explained and, (6) using standard topic for the lesson by making a students' book together with the other teachers who teach in the same subject. The results of this study are same as the theory, because the core points of the theory have already been conveyed. Therefore, the researcher concludes that the overall techniques used by the teacher are the same as the theory although there are some that are not conveyed perfectly in teaching and learning process.
2. The second point is about the problems faced by the natural science teachers in MTs Bilingual NU Pucang Sidoarjo in

using English as the Medium of Instruction (EMI) in teaching natural science subject. It was found three problems that the teacher faced in using English as the Medium of Instruction (EMI) in teaching natural science subject. The first problems are language difficulties which includes polysemous word and different vocabularies. The second problem is recognizing specific word in a category. And then the third problem is text analysis.

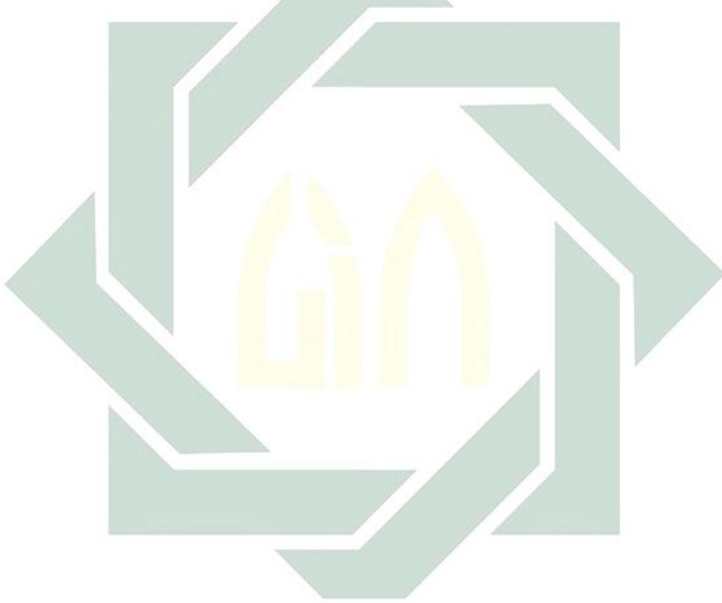
B. Suggestion

After doing the research, interpreting the data and discussing the result, the researcher would like to give some suggestions based on her experience when she conducted the research. The researcher expected that the result of this research would give contribution for teaching and learning process especially in using English as the Medium of Instruction (EMI) in teaching subject matter such as natural science, math, civic, social, and etc.

First suggestion is for the non-English teachers who teach in Bilingual school which is implementing English to teach subject matter. Teaching the students by using English is not easy to be implemented. Choosing an appropriate technique is needed because it can help the teachers easy to using English for teach subject matter. Clearly instruction, comprehend the material, implement the creative learning, and monitoring the students' ability are needed to do for the teachers because it will make the students easy to understand about the lesson. In the other hand, the teachers should learn and improve their English proficiency particularly in mastering vocabularies in English and subject matter, and understanding the material especially when read international journal in order be able to reduce the problems that faced in using English as the Medium of Instruction (EMI) in teaching subject matter. So, the process of teaching and learning will run well.

Second suggestion is for the next researcher who wants to conduct a research which have same topic about the use of English as the Medium of Instruction (EMI) in teaching natural science subject and the teacher problems when using English as the

Medium of Instruction (EMI) in teaching subject matter. For the other researcher who wants to conduct this research, it would be better try to observe about the students' perception about the implementation of English as the Medium of Instruction (EMI) in teaching subject matter. In the other side, the other researcher can conduct the research which focuses on the other subject matter such as in math, social, civic, and etc. So, it will get more the data and information in order to make the research more broad rather than the previous study.



REFERENCES

- Boyatzis, R.E, 1998. *“Transforming qualitative information thematic analysis and code development”*. Thousand Oaks, CA.
- Cheah Tong Tiat (2004). *“Sikap Guru Pelatih Terhadap Pengajaran Matematik dalam Bahasa Inggris”*. Jurnal Penyelidikan MPSAH 2004.
- Crystal, David (2003). *“English as a Global Language*. Cambridge University Press:London, p.4
- Dan Keller, (2011). *“Towards a system of evaluating a school international educational program”*. Associate Director General Bilkent Laboratory and International School. p.15
- Depdiknas, (2003) *“Peraturan Menteri Pendidikan Nasional no. 22 tentang kerangka dasar dan struktur kurikulum bahasa inggris SMP dan MTS. (Jakarta; 2003)* p.9
- Gomez and Mata, *“Vocabulary Instruction for ELL Students in the Middle School Science Classroom”* Voices from the Middle, Volume 13, No. 1 September 2005.)
- Haagen-Schützenhöfer, Claudia, Mathelitsch Leopold, *“English as a Medium of Instruction in Science-Teaching”* Institute for Theoretical Physics, University of Graz, Austria. P.1
- Hanadi Kadbey, Martina Dickson, and Melissa McMinn, 2015. *“Primary Teachers Perceived Challenges in Teaching Science in Abu Dhabi Public Schools”*. Procedia - Social and Behavioral Sciences vol. 186 p.749
- Harmer, Jeremy. *“The Principle of English Language Teaching”*. (England: Longman,1991), p.56

- Henderson, J & Wellington, J. 1998. "*Lowering the language barrier in learning and teaching science*". *School Science Review*, vol 79 (288): 35 – 46.
- Ibrahim Muhammad al faqih and Abdoel moneim hasan. 2014. "*Difficulties facing teacher in using interactive white board in their classes*". *American International journal of social science*. vol 3 no 2.
- John W Creswell, *Educational research : Planning, Conducting and evaluating quantitative and qualitative research* , (Boston library of congress cataloging in publication data 2012) 218
- Soren, Joyce Kling. "*Teacher Identity in English-Medium Instruction: Teacher Cognitions from a Danish Tertiary Education Context*". *Linguistics*. University of Copenhagen. Faculty of Humanities, 2013. P. 3
- Moh. Nazir, *Metode Penelitian* (Bogor:Ghalia Indonesia, 2005),
- Mc Keon, D. "*Language, Culture and Schooling. In Educating Second Language Children, ed. Genesee*". F. Cambridge University Press. New York. 1994. P.3
- Moeleong, Lexy J, 2001. "*Metodologi Penelitian Kualitatif*". PT Remaja Rosdakarya, Bandung
- M. Fadhili Bin Yahaya, Mohd Asri Bin Mohd Noor, Ahmad Azman Bin Mokhtar, Rafizah Binti Mohd Rawian, Kamaruzaman Jusoff. "*Teaching of Mathematics and Science in English: The Teachers' Voices*" *English Language Teaching* · May 2009. Vol. 2 No.
- Peter Hudson, "*Learning to teach science using English as medium of instruction*"
- Thesis. Queensland University of Technology. 2009

- Pusat Kurikulum, 2006. "*Panduan Pengembangan Pembelajaran IPA Terpadu SMP/MTS*". Balitbang Depdiknas, Jakarta.
- Selamat, Asri and Esa, Ahmad and Saad, Shamsaadal Sholeh and Atim, Asliaty (2010). "*Teaching and Learning Mathematics And Science In English In Primary Schools In The State Of Johor, Malaysia*". Journal of Education, 16 (2011).
- Srini M. Iskandar. (1996). "*Penelitian Ilmu Pengetahuan Alam*". Jakarta: Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan dan Kebudayaan.
- Sudirman A.M, 2008. "*Interaksi dan Motivasi Belajar Mengajar*" Jakarta : PT. Raja Grafindo Persada. P.144
- Sugiono, "*Metode Penelitian Pendidikan*" (Bandung:Alfabeta 2010)
- Wahyunengsih, "*Penggunaan Metode Team Teaching sebagai inovasi pengajaran sains (IPA) dalam bahasa inggris di sekolah RSBI*". Padang 2004). p.4
- (<http://www.gly.uga.edu/>) An addendum to the GEOL 1122 reading on "What is science?". University of Georgia. Accessed on, January, 2nd 2017