



**MATHEMATICS AND SCIENCE TEACHERS' PERCEPTIONS
ON THE USE OF ENGLISH AS A MEDIUM OF
INSTRUCTION**

a final project

submitted in partial fulfillment of the requirements for the degree
of *Sarjana Pendidikan* in English Language Education

by

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DECLARATION OF ORIGINALITY

I Ira Yuliasih hereby declare that this final project entitled Mathematics and Science Teachers' Perceptions on the Use of English as a Medium of Instruction is my own work and has not been submitted in any form for another degree or diploma at any university or other institute or tertiary education. Information derived from the published and unpublished work of others has been acknowledged in the text and a list of references is given in the references.

Semarang, January 2019



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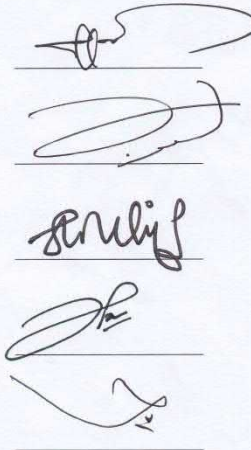
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APPROVAL

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MOTTO AND DEDICATION

I decided long ago
Never to walk in anyone's shadows
If I fail if I succeed
At least I'll live as I believe
No matter what they take from me
They can't take away my dignity

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To:

My dearest mother, father and sister

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ABSTRACT

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Key words: Teachers' Perceptions, English as a Medium of Instruction, EMI

This research was conducted to investigate the perceptions of mathematics and science teachers towards the use of English as a Medium of Instruction (EMI). The objectives of this study were to describe the implementation of EMI by the mathematics and science teachers in classrooms and to explain their perceptions in using EMI. The study was held in three schools consisting of an elementary school and two junior high schools. There were six teachers participating who were chosen based on purposive sampling technique. The data were collected through classroom observations, questionnaires and interviews. In analyzing the data, this study used qualitative approach. The implementation of EMI was analyzed based on four main principles of the implementation of CLIL by Coyle, et al. (2010) referring to content, communication, cognition, and culture. It was found that most of the teachers involved in the study implemented EMI in the classroom well. The analysis of teachers' perceptions towards EMI is based on the three dimensions of perceptions according to Calhoun and Acocella (1995) including knowledge, expectation and evaluation. It was found that the teachers have positive perceptions towards EMI. They assumed that EMI will help their students to improve their English proficiency which is beneficial for their future lives. However, some of them admitted that they are not proficient enough in English so that they need more effort to develop themselves in terms of communication skills in the language.

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CHAPTER I

INTRODUCTION

This chapter includes background of the study, reasons for choosing the topic, research problems, objectives of the study, significances of the study, and outline of the research.

1.1 Background of the Study

In this 21st century, there have been changes and improvements happened toward many aspects of lives such as technology, economy, education, and so on. To respond to those changes, the demand of people with good qualification is increasing because those people are most likely to adapt and innovate in this competitive era. In order to be able to compete globally in this era, people need to be proficient in some skills. Those skills are known as 21st century skills including critical thinking and problem solving, communication, collaboration, and also creativity and innovation. To prepare Indonesian citizen to face this new global demand, governments improve the education quality.

As a national language, *Bahasa* Indonesia has become language of instruction in most of Indonesian schools. However, today's era forces people not only able to compete nationally, but also internationally. Harmer (2001, p.1) stated that English has become a lingua franca. In other words, it has been

considered as an international language used by people with different native languages to communicate. Therefore, nowadays English mastery is very important.

Now, English is not only taught as a subject but also used as a medium of instruction in some schools in Indonesia, which mostly are private schools. That type of school usually conducts bilingual education that involves additional language in the instruction which is English. Even some of those schools integrate National and International Curriculum to conduct the education. Consequently, teachers are demanded to be able to teach subjects such as mathematics and science using English. To cope with the use of English as a medium of instruction (EMI), CLIL (Content Language Integrated Learning) is usually applied. It is an educational approach that focuses on both content and language in which additional language is used for the learning and teaching (Coyle et al., 2010). Teacher who applies CLIL should be able to teach one or more subjects in the curriculum in a language other than the usual language of instruction and in addition to teach that language itself (Eurydice, 2006, p.41). Therefore, teachers are expected having both language and content competences. As the most dominant mode of CLIL, EMI has been globally implemented throughout the world in terms of business communication and academic exchange. (Huang, 2015).

Since English is considered as a foreign language in Indonesia, teaching students using English might be a challenge for some Indonesian teachers. Teachers should be a role model for students in speaking English and also lead

them to understand the materials. Despite of all the challenges that teachers might have faced through their teaching experience, they must have found ways to cope with which shape their perceptions towards the use of English as a medium of instruction (EMI). Candlin and Mercer (2001) examined that perceptions' of teachers towards English play role in determining success or failure of themselves and their students in the teaching and learning context.

In Indonesia, specifically in Semarang, there are some bilingual schools, from primary until high school level, which involve English as the medium of instruction to teach subjects such as mathematics and science. Therefore, this study is aimed to explore teachers' perceptions in using English as a medium of instruction in teaching mathematics and science within the context of local education in Semarang.

1.2 Reasons for Choosing the Topic

There are several reasons which become my point of considerations in choosing this topic. Teaching content subjects using English might be a challenge for Indonesian teachers since English is considered as a foreign language in Indonesia. For them, delivering materials in English probably is not as easy as in *Bahasa* Indonesia. However, every teacher must have their own views regarding the use of English to teach subjects in particularly mathematics and science that might have shaped their perceptions that affect their performance in classroom. In Semarang, there are some schools which conduct bilingual education which adapt English as a medium of instruction. However, most of which are private schools.

Consequently, this situation is not very common for those who go to government schools which most of them using *Bahasa* Indonesia as medium of instruction.

Therefore, by conducting this study hopefully could show a general picture of how bilingual education is conducted in Indonesia especially in Semarang city and how Indonesian teachers actually perceive it.

1.3 Research problems

The research problems of this study are:

- 1) How is the implementation of English as a medium of instruction by the teachers in the classroom?
- 2) How do the mathematics and science teachers' perceive the use of English as a medium of instruction?

1.4 Objectives of the Study

Based on the research problems, the objectives of the study are:

- 1) To describe the implementation of English as a medium of instruction by the teachers in the classroom.
- 2) To find out and explain mathematics and science teachers' perceptions in using English as a medium of instruction.

1.5 Significances of the Study

There are some benefits of the study which are divided into three aspects. Theoretically, this study will give information to the readers of teachers' perceptions towards English as a medium of instruction in teaching mathematics and science, and also its implementation in the classroom. Practically, this study hopefully will raise understanding among teachers of the intention in using English as a medium of instruction. Besides, the implementation done by teachers that will inspire other teachers who still have problem in teaching content area subjects using English to teach their student in a better way. Pedagogically, this study hopefully will provide knowledge and references which can help improving Indonesian education quality.

1.6 Scope and Limitation of the Study

The scope of this study is bilingual education where English as the additional language used as the medium of instruction in the education. The data is limited to teachers' perceptions according to theory by Calhoun and Acocella (1995) towards the use of English as the medium of instruction as a mode of Content Language Integrated Learning to teach mathematics and science subjects. Furthermore, this study was hold in three bilingual schools in Semarang region and involved six teachers consisting of mathematics and science subject teachers as the participants.

1.7 Definition of Key Terms

In this section a number of terms related to this study will be defined.

a. Bilingual Education

Lotherington (2000) defines bilingual education as a type of education in which the teaching of the curriculum is supported through medium of two languages. Meanwhile, according to Cenoz (2009), bilingual education is the use of two languages in education provided that schools aim at bilingualism and biliteracy. Therefore, from the definitions above, I conclude that bilingual education is a type of education where two languages are used in education of schools which aim at bilingualism and biliteracy.

b. Content Based Instruction (CBI)

According to Brinton et al. (1989), CBI is the simultaneous study of language and subject matter where the form and sequence of language presentation based on content materials. While based on Richards and Rodgers (2001), CBI is an approach to second language teaching that is organized around the subject matter that students will learn than the linguistic. Moreover, Stoller (2008) in Cenoz (2015), defines CBI as an umbrella term referring to instructional approaches that have dual focus to language and content-learning objectives. I can conclude that CBI is an umbrella term which refers to approaches that simultaneously study language and subject matter.

c. Content Language Integrated Learning (CLIL)

Dalton and Puffer (2007) define CLIL as an educational setting where the medium of instruction uses a language which is different with the students'

mother tongue. While Coyle et al. (2010) defines CLIL as a dual-focused educational approach using additional language for learning and teaching of both content and language. Furthermore, according to Marsh (2002), CLIL is an umbrella term which refers to a dual-focused educational context in which an additional language is used as a medium in the teaching and learning of non-language content. I can draw a conclusion that CLIL is an umbrella term referring to methodologies that lead to dual-focused education where attention is given to both content and language of instruction.

d. English as Medium of Instruction (EMI)

According to Dearden (2014), EMI is the use of the English language to teach academic subjects in countries or jurisdictions where the major population's first language (L1) is not English. Moreover, Dearden and Macaro (2016) define EMI as an umbrella term for academic subjects taught through English. Therefore, I conclude that EMI is English language that is used to teach academic subjects in countries where the first language of the majority of the population is not English.

e. Immersion Program

Lotherington (2000) defines immersion program as a type of bilingual education in which a second language is taught indirectly through curriculum subjects as the medium of instruction. Meanwhile according to Cenoz (2009), immersion program is educational programs using a second language as the language of instruction for all or some subjects. In conclusion, Immersion program is a type of education which uses a second language as the language of instruction to teach curriculum subjects.

f. Perception

Schiffman and Kanuk (2004) define perception as the process that an individual selects, organizes and interprets information inputs to create a meaningful picture of the world. Similarly, according to Robbins and Coulter (2012, p. 387) perception is defined as a process of people in giving meaning to their environment by interpreting and organizing impressions of sensory. While based on Devito (2013, p. 62), perception is an active process in which people become aware of objects, events, and through senses such as sight, smell, taste, touch, and hearing. From the definitions by experts above, I can conclude that perception is a process of individuals in interpreting and organizing information through senses to get meaningful picture of the environment.

1.8 Outline of the Report

This final project consists of five chapters. Chapter I presents introduction consisting of background of the topic, reasons for choosing the topic, research problems, objectives of the study, significances of the study, and outline of the research.

Chapter II discusses review of the previous studies, review of related literature which consists of general theory of English Medium of Instruction (EMI), bilingual education, immersion program, Content Based Instruction (CBI), Content Language Integrated Learning (CLIL), perception, and the theoretical framework.

Chapter III deals with the method of investigation which consists of research design, research sites, participants, roles of the researcher, type of data, instrument for collecting data, procedure for collecting data, procedure of analysing data, and triangulation. Meanwhile, chapter IV tells about the research findings and discussion of the study. Finally, the last chapter is chapter V which presents the conclusions and suggestions.

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter consists of some studies which had discussed about perception of teachers towards English as a medium of instruction and some theories underlying the topic of this study.

2.1 Review of the Previous Studies

In this part, I will review some studies conducted in the past related to this study.

In 2012, Channa, a master student of Mahidol University, Thailand, conducted a study by investigating teachers' perceptions towards English as a medium of instruction at Park University in Pakistan. To gain the data, semi structured interview and class observation were conducted. He categorized the findings into teachers' positive and negative perceptions towards ELMI (English Language as Medium of Instruction). More than a half of teachers who participated have positive perceptions towards ELMI. They regarded English is beneficial for their students to learn effectively, develop their confidence and comprehend scientific theories, logics, reasons and problems for playing their roles to participate actively either in or outside the classroom. Meanwhile, the rest of the teachers have negative perspectives. They against the use of English as a medium of instruction in imparting scientific knowledge since they thought that it is not beneficial for learners that have different language backgrounds. The

learners are considered performing well in Urdu which is Pakistan's national language. Those teachers also expect the government to publish subject materials in either major regional languages or national language.

Supporting the previous study, Saeed et al. also in 2012 conducted a study aimed to find out perceptions of teachers and their competencies regarding the use of English-medium instructions to teach science and mathematics at secondary education in Punjab, province of Pakistan. The participants of the study were 85 content area teachers who were teaching or have taught mathematics and science subjects in medium of English or partially in English from 17 schools in 4 districts with at least five years teaching experience. The data are obtained from questionnaires and interview. The data indicated that although teachers did not favor English as a medium of instruction at secondary education they understand that the EMI is useful for taking part in the worldwide competition. However, those teachers still lack the competency in teaching in English. Besides, they find that students have problems in understanding concepts of mathematics and science in English. Teachers perceived that students can understand the concepts of science and mathematics in Urdu better.

Similarly, in 2013, Basibeka et al. from Turkey investigated lecturers' perceptions towards English as medium instruction at Engineering Departments at some state universities in Turkey. The data were collected using questionnaire that was formerly used by Tung, Lam, and Sam in their study in 1997 with some modifications. From the questionnaires, it is shown that the lecturers participated in this study have positive attitudes towards adopting EMI. They agree that

instruction in English will contribute to the learners' English proficiency levels and also can promote them to be more successful in lives after university. Besides, through EMI, learners could make use of their fields of study more since they could access to resources in English. Despite of all the benefits and opportunities of knowing English, some lecturers still have problem with English such as limited experience and proficiency in teaching in English. Therefore, specific training need to hold to help them develop the interactive and communication skills that are needed for lecture situations in target language.

Besides teacher's perspectives, back in 1997, Tung, Lam, and Sam from University of Hong Kong conducted a large-scale survey of students', teachers', and parents' attitudes towards the use of English as a medium of instruction in Hong Kong secondary schools. The study was conducted in twenty-four secondary schools with more than 5000 students, 4600 parents, and 700 teachers participated. All participants responded to questionnaires which are specially designed for each group. The data indicates that the participants from the all three groups agree that Chinese medium of instruction can enhances student's learning. Other than that, it can also be helpful for them to master English that beneficial for higher education and better employment prospects.

Similar to the previous study, in 2012, Thirunavukkarsu from Sri Lanka also explored views of parents and children about either English or vernacular language used as medium of instruction in two different high schools. He used questionnaires and interviews to gain the data. From the teachers' perspective, most of them agreed that English medium learners perform better in all domains

than the vernacular ones with some reasons such as those students can refer to various book to learn more that make them more confident and also English help them memorize easily. From the learners' perspective, almost 90% of English medium learners have a positive attitude towards English medium education while the vernacular learners still find difficulties in dealing with English. Finally, from the parents' side, they understand the importance of English and they believe it will open ways to many opportunities in this globalized world especially for their children.

Furthermore, in 2015, Tilahun from Department of English, Dilla University, Dilla, Ethiopia investigated subject teachers' perceptions towards the use of English as a medium of instruction to improve students' language proficiency. The study uses both quantitative and qualitative research methods. Subject teachers who teach in the second and third year at Dilla University are randomly chosen to involve in this study. The data were collected through questionnaires, interviews and classroom observations. The result of this study is that most of the teachers have positive perspectives towards the use of English as the medium of instruction to improve their students' English language skills. Those teachers are practically contributing to the improvement. They also believed that their corporation with English teachers will be beneficial to help their students. Besides, teachers provide emotional support to facilitate positive environment in use English language for the class room interaction.

Still in the same year, Owu-Ewie and Eshun examined the use of English as medium of instruction at the upper basic level (primary four to junior high

school) in Ghana. The purpose of this study was to find out whether English is used as medium of instruction in Ghanaian upper basic schools (Primary 4 to JHS) since it has been the government's policy. The data were collected through interview and observation participated by 100 pupils and 40 teacher from 10 schools consisting of upper primary schools and junior high schools. From the data, it is found that this language policy of education is disobeyed. Teachers still use both the L1 and English (L2) in such classrooms. Teachers often use translation, code-switching and mixing, and also safe talk. The main reason to be the cause of such situation is the students' lack of proficiency of English use and the lack of enforcement of the language policy. Therefore, the teachers tend to use Ghanaian langue in teaching. To overcome this problem, the use of English at the Upper primary and JHS can be improved by strict enforcement of the language policy of education, improvement in the teaching of English, extension of the use of L1 as medium of instruction, and creation of a conducive classroom atmosphere to the use of English as medium of instruction.

Meanwhile, students' have their own perspectives towards EMI as found out in a study done by Huang from Southern Taiwan University of Science and Technology (STUST) in 2015. The study was aimed to investigate the students' perceptions of the EMI courses at STUST towards their learning motivation, anxiety and achievement. Self-assessment questionnaires are used to collect the data and quantitative method was used to analyse them. The findings of the study that can be concluded as follows:

- (1) most of the participants were motivated to take EMI courses in order to strengthen their English ability
- (2) most of the participants agreed that EMI courses is helpful,
- (3) interacting with students with different nationalities could motivate learning,
- (4) anxiety experienced by local students is majorly caused by low English proficiency self-perceived,
- (5) there is significant correlation between students' learning anxiety and achievement, and
- (6) there are significant differences between local and international students in term of motivation, anxiety, and achievement.

More specifically, in Indonesian context, Fitriati in 2012 investigated subject teachers' language ideologies of English during the implementation of the Indonesian government's policy on the use of English in teaching Mathematics and Science and a habitual use of the language in selected government-owned schools. The study was hold in Senior High School *Negeri* located in Semarang, the capital city of Central Java, Indonesia, involving five teachers as participants. The participants were teachers of Mathematics, Biology, Chemistry, Information Communication Technology, and Geography. Besides the teachers, there were school's executives who also involved in the study consisting of the acting principal, the deputy principal for academic affairs, the program coordinator, an English teacher and a senior government officer at the Department of Education Central Java Province. In collecting the data, the researcher used whole-school

observations, classroom observations, observation notes, in-depth interviews, and also site document reviews. From the data, it was shown that those five teachers had various English language ideologies towards the promotion of the use of English in teaching Mathematics and Science and the habitual use at school which could be categorized into 5 themes: 1) English is a heavy burden, 2) We have our own language, 3) English is the international language, 4) English benefits students in the future, and 5) English will not decrease our nationalism. The data also revealed how their ideologies were manifested in their classroom practices which implied 6 key features including teachers' use of codeswitching, allowing students to codeswitch, teachers' lack of awareness of their language errors, use of safetalk strategies, using English-medium PowerPoint as a useful tool to teach in English, and cooperative learning techniques to promote using English. Meanwhile, school's executives revealed multiple and conflicting English language ideologies among school executives.

Moreover, Sudiatmika, Nitiasih, and Suarnajaya from Postgraduate Program Universitas Pendidikan Ganesha conducted a study in 2013 towards mathematics and science teachers' perceptions on the use of English as a Medium of Instruction (EMI) at Pre-International Standard School (RSBI) at SMP N 1 Denpasar. It includes their efforts to improve the use of English and the frequency in using it in the classroom, and the communication strategies used by them in the science classes. The subjects of the study were mathematics and science teachers, including biology and physics teachers of grade eight. The methods used were the combination of qualitative and quantitative methods. To gather the data of

teachers' perceptions, semi-structured interview and close questionnaire were applied. Classroom observation was conducted to find out the frequency of the use of English by teachers in the classroom by recording the instructional process. Based on the data found, it is shown that the mathematics and biology teachers have good perceptions, while the physics teachers have average perceptions toward the use of English as medium of instruction. However, the frequencies on the use of English in the instructional process by the teachers are very low. Finally, there are five types of communication strategies used by the teachers which are language switching, pausing, use of non-linguistic resources, clarification check, and comprehension check.

Additionally, teachers' pedagogical and professional competences in teaching English, Mathematics, and Science in CLIL-based primary schools has investigated in 2016 by Puspitasari et al. from Universitas Negeri Malang. This study was conducted in two private primary schools in East-Java. The method used is descriptive quantitative. The data are obtained from questionnaires, interviews, classroom observations and a test. Based on the data, it is found that both schools have implemented shared curriculum, blending the national and international frameworks. All teachers participating in this study from both schools are considered competent in pedagogical aspect, yet claimed as fairly competent in professional aspect. However, some teachers need more effort to develop themselves in terms of skills in language and knowledge on content. Moreover, CLIL model instructions in both schools need to be improved.

Based on the all the previous studies above, I would like to conduct the similar study aimed to find out teachers' perceptions on the use of EMI in a different context, specifically in Semarang.

2.2 Review of Theoretical Background

In this section, I present some theories which are underlying the research including general concept of English Medium of Instruction (EMI), Bilingual Education, Immersion Program, Content-based Instruction (CBI), Content and Language Integrated Learning, and perception.

2.2.1 English Medium of Instruction (EMI)

2.2.1.1 Definitions

Nowadays, there has been a global shift from English taught as a foreign language to being the medium of instruction to teach subjects such as science, mathematics geography, and medicine. According to Dearden (2014), the Senior Research and Development Fellow in EMI at Oxford University Department of Education (OUDE), English as Medium of Instruction (EMI) is the use of the English language to teach academic subjects in countries where the first language (L1) of the major population is not English. EMI has been widely used in universities, secondary school and even primary school throughout the world.

2.2.1.2 The Advantages of EMI

Ibrahim (2001) in his paper points out some advantages of the implementation of EMI especially in Indonesian context.

a. Bilingualism could give cognitive advantages

According to Baker and Jones (1998) in Ibrahim (2001) psychological test found out that children who are bilingual are better in fluency, flexibility, originality, and elaboration in thinking than those who are monolingual. In other words, bilingualism enables creative thinking, more flexibility and richness of thoughts.

b. The role of English would motivate both teacher and students to learn it

The important role of English in this globalization era for social, academic and professional purposes would stimulate teachers and students to improve their English proficiency.

c. Emi provides more exposure to English and chance to acquire it

In EMI classroom, students and teachers will not learn English as a subject, but will use it as a medium to learn subject matter. English is used to perform the instructional activities such as getting information (reading and listening) and conveying information (writing and speaking). Therefore, this situation provides both teachers and students more exposure to the language that leads to successful language acquisition.

- d. Literacy skills and strategies gained in a native language transfer to a second language

According to Cummins as stated in Ibrahim (2001), even though two languages seem different in terms of vocabulary, grammar, orthography, etc., they have some things in common functions in terms of higher-order thinking skills like analysis, synthesis, evaluation, etc. On other words, some skills and ability that a person has in their native language such as reading skills including skimming, scanning, using background knowledge about the text, etc. are transferable to his/her second language and useful for acquiring its literacy.

2.2.1.3 The Threats of EMI

Ibrahim (2001) also points out some factors which may discourage the implementation of EMI.

- a. Dilemma between instruction and English

In the implementation of EMI, the instruction is delivered in English. This may lead to a problem for students whose first language is *Bahasa* which they probably feel most comfortable to use. Collier also argues that forcing learner to use undeveloped second language at school is likely to lead to academic failure.

- b. Unsupportive environment

In Indonesia, English is considered as a foreign language, not a second language. Most of Indonesian people do not use English in their daily lives as often as people in countries where English is used a second language such as Malaysia, Singapore, India, etc. English is only a foreign language taught in school. So that Indonesian people do not get exposure of English in their

environment that much. Therefore, the implementation of EMI will only be happening inside the classroom and not simultaneously supported by the environment.

c. The lack of English proficiency among teachers and students

Even though most of Indonesians who are educated have learned English since elementary school, their proficiency remains poor since they only get the lesson in school and do not use it in daily basis. This situation surely has negative effects on academic, social, and psychology side. Academically, the lack of English proficiency may lead to inefficient and ineffective teaching and learning process. The materials might not be able to be delivered and acquired well that will lead to misinformation, misconception, or even misunderstanding among teacher and students. Socially, well-mastering English will allow teachers to express their thoughts and emotion, but that will not happen if the teachers are not able to do it communicatively. Meanwhile, students tend to have difficulties in expressing themselves and developing interpersonal relationship with their teacher and friends. Psychologically, the difficulties in self-expressing because of this lack will create the feeling of frustration low self-esteem. Teachers with lack of English proficiency will be negatively viewed by their students that lead to students' negative perceptions towards them.

d. The 'context-reduced' nature of classroom communication

There are two types of language that students need to succeed in bilingual schooling, which are BICS (Basic Interpersonal Communication Skills) and CALP (Cognitive/Academic Language Proficiency). BICS is language we use

when there is contextual support like on daily conversations. Whereas CALP is academic language which is more formal and technical. In EMI classroom, English become the medium to deliver the subject matter. This situation is likely to reduce the context of classroom communication because most of the talks are based on academic purpose with formal and technical context. Therefore, this makes it more difficult for teachers and students to acquire English.

e. The limitedness of classroom discourse

The implementation of EMI in the classroom involves classroom language and communication just like typical traditional classroom. However, this situation of communication discourse in EMI classroom usually only employs one context of setting which is classroom, certain language skills, language tasks, academic topic, and a particular purpose of information (informative) that provide teachers and students only with a formal situation. This classroom-limited situation is not ideal for maximum second language acquisition because it will not provide opportunity for both teacher and students to develop the social functions of language which is important for effective communication.

2.2.2 Bilingual Education

2.2.2.1 Definition

According to Lotherington (2000, p. 48), a person can be considered bilingual if he or she is able to effectively communicate in a range of situations in a second language because bilingualism is about functionality. While he defines bilingual

education as a type of education in which the teaching of the curriculum is supported through medium of two languages (p. 51).

2.2.2.2 Bilingual Education in Indonesia

The realization of bilingual education in Indonesia was officially introduced by the emergence of Pre-International Standard School (*Rintisan Sekolah Bertaraf Internasional*) Program in 2006. It is based on Law number 20 year 2003, on national education system, article 50 paragraph (3) which states that the government and local government organize at least a unit of education in every level of education to be developed as a unit having international standards of education. This program is expected to improve the quality of national education that can enhance competitiveness of Indonesia towards other countries. There are number of strategies related to the implementation of this program, one of them is using English as medium of instruction (EMI) in teaching and learning process specifically for mathematics and science subjects including physics, chemistry, and biology. However, for some reason, the government abolished this program in 2013 since it led to a lot of controversy.

2.2.3 *Immersion Program*

Immersion education was established in Canada during 1960s by a group of English-speaking parents that concern about second language (French) learning of their children. Immersion is a type of bilingual education in which a second

language is taught indirectly through curriculum subjects as the medium of instruction. (Lotherington, 2000, p. 51).

Swain (1979, p. 20) points out three models of immersion.

- a. Early Total Immersion, meaning the immersion program begins since the first day of schooling (kindergarten) and the instruction is delivered fully through second language.
- b. Early Partial Immersion, meaning two languages (L1 and L2) are used as languages of instruction since the first day of schooling.
- c. Late Immersion, meaning the starting point of immersion program is in grade 7 or 8.

According to Swain and Johnson (1997), immersion program can be implemented as full or partial. Full immersion means the native language is not used in the curriculum at all while partial immersion refers to that curriculum subjects are taught through little or less than 50% of second language.

2.2.4 Content Based Instruction (CBI)

CBI was first appeared in North America in the early 1980s. Brinton et al. (1989) defines CBI as the simultaneous study of language and subject matter where the form and sequence of language presentation based on content materials. While according to Richards and Rodgers (2001), CBI is an approach to second language teaching that is organized around the subject matter that students will learn than the linguistic. It is an umbrella term referring to instructional approaches that have

dual focus to language and content-learning objectives. (Stoller, 2008 in Cenoz, 2015). I can conclude that CBI is an umbrella term which refers to approaches that simultaneously study language and subject matter.

2.2.5 Content Language Integrated Learning (CLIL)

2.2.5.1 Definition of CLIL

The term CLIL was first introduced by European experts in 1990s as a generic ‘umbrella’ term referring to methodologies that lead to dual-focused education where attention is given to both content and language of instruction. According to Dalton and Puffer (2007, p. 1), CLIL refers to educational setting where the medium of instruction uses a language which is different with the students’ mother tongue. While Coyle et al. (2010) defines CLIL as a dual-focused educational approach using additional language for learning and teaching of both content and language. An additional language is often a learner’s foreign language but it may also be a second language.

2.2.5.2 The Implementation of CLIL in a Classroom

According to Coyle et al. (2010), there are four main principles of CLIL. The combination of those principles can determine the success of the implementation of CLIL. Those principles are known as 4C:

(1) Content

Content is the topic or subject matter. This means the learners are able to acquire knowledge, skills, and understanding as the result of the instructional process. Meanwhile, the teachers should master the subject matter so that they can deliver the material to their students well.

(2) Communication

Communication refers to language learning and using. This means the students learn language so that they are able to use it to interact and communicate with others. While in delivering the lesson, teachers are expected to use good communication skills.

(3) Cognition

Cognition refers to learning and thinking process. CLIL allows individuals to construct their own understandings. It develops their skills in higher-order thinking and understanding, problem solving and also accepting challenges and reflecting on them.

(4) Culture

Culture refers to intercultural understanding and global citizenship. CLIL demands tolerance and understanding. By studying through a different language, people also learn its culture which surely has either similarities or differences with our own culture. This can improve students' ability to understand themselves and others and to respect differences and similarities among cultures.

2.2.5.3 Teacher's Role in CLIL Classroom

Teacher's role in the CLIL classroom is very important. Eurydice (2006) stated that CLIL teacher should be able to teach one or more curriculum subjects in a language other than the usual language of instruction and the language itself.

Marsh et al. (2001) outlined the CLIL teacher competencies:

- a. Language/communication, including having sufficient knowledge and pragmatic skill of target language and language used for CLIL, and also fluent in additional language.
- b. Theory, referring to knowing the differences and similarities between the concepts of language learning and language acquisition.
- c. Methodology, involving having the ability to identify linguistic difficulties, use methodologies that provide optimal opportunities for learners to communicate by enriching communication strategies, use strategies (e.g. repetition, echoing etc.) for correction and for modeling good language use, and to identify and use dual-focused activities which simultaneously provide language and subject aspects.
- d. The Learning Environment, referring to the ability to use different classroom settings, to work with learners with diverse linguistic/cultural backgrounds, to form strategies, and also having knowledge of the potential of information and communication technology on CLIL learning environments.

- e. Materials development, involving the ability to adapt and make use of materials and to select compatible materials on a given topic.
- f. Assessment, referring to the ability to develop and implement assessment and evaluation tools.

2.2.6 *Interrelation among Bilingual Education, CLIL, CBI, EMI, and Immersion program*

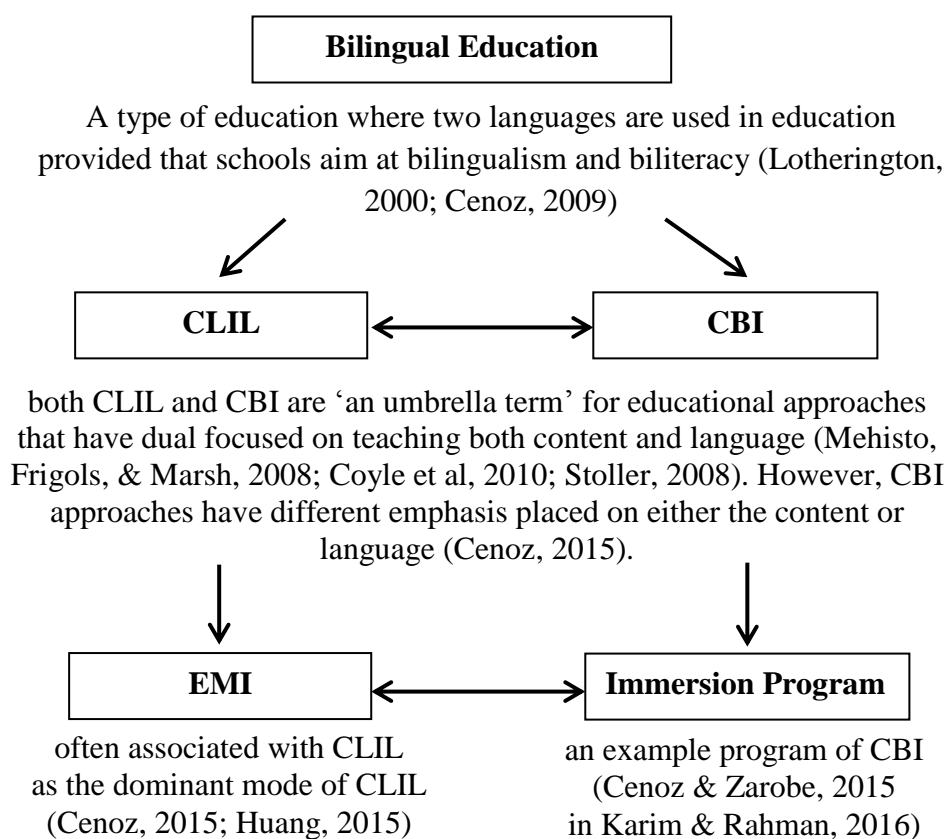


Figure 2.2.6 Interrelation among Bilingual Education, CLIL, CBI, EMI, and Immersion program

Table 2.2.6 Interrelation among Bilingual Education, CLIL, CBI, EMI, and Immersion program

CLIL	CBI	Bilingual Education	Immersion Program	EMI
First introduced in Europe	First appeared in North America	First adopted in Ohio, US	Introduced in Canada	First adopted in European countries
An umbrella term of dual-focused education approaches where attention is given to both topic and language	An umbrella term for instructional approaches that simultaneously study language and content where content is used as a vehicle for helping students master language	Curriculum subjects taught through medium of two languages	Second language is taught indirectly through subjects	English language is used to teach academic subjects
Language used is not spoken locally and students only have contact with in formal instruction context		Involving additional language which can be learner's L2 or foreign language	Language used presents in students context (home, society at large, or both home and society)	The first language of major population in the country where it is applied is not English
The syllabus depends on the age of the learners	The syllabus depends on whether it is content or language-driven		an example of CBI approaches	dominant mode of CLIL

2.2.7 Perception

2.2.7.1 Definitions of Perception

Schiffman and Kanuk (2004) define perception as the process that an individual selects, organizes and interprets information inputs to create a meaningful picture of the world. Similarly, according to Robbins and Coulter (2012, p. 387) perception is defined as a process of people in giving meaning to their environment by interpreting and organizing impressions of sensory. Further, they state that individuals may look at the same thing but they perceive it either negatively or positively that result in different perceptions. Their behavior is determined by their perceptions. While based on Devito (2013, p. 62), perception is an active process in which people become aware of objects, events, and through senses such as sight, smell, taste, touch, and hearing. It can result either from what exists in the outside world or from your own experiences, desires, needs and wants, loves and hatreds. From the definitions by experts above, I can conclude that perception is a process of individuals in interpreting and organizing information through senses to get meaningful picture of the environment.

Robbins et al. (2014, p. 143), point out factors that shape perception.

- (1) Factors in the perceiver, consisting of attitudes, motives, interest, experience, expectations;
- (2) Factors in the situation, consisting of time, work setting, social setting;
- (3) Factors in the target, consisting of novelty, motion, sounds, size, background, proximity, similarity.

While according to Calhoun and Acocella (1995, p. 285), there are 3 dimensions of perceptions, the same dimensions as those which define self-concept.

- (1) Knowledge, referring to what someone knows about himself or about things.
- (2) Expectations, referring to someone's idea to be something or to do something.
- (3) Evaluation, referring to final conclusion for fulfilling expectations.

The term 'perception' is often associated with term 'attitude'. However, they do not mean the same. Attitude refers to the way one thinks, feels, and acts toward some aspects of the environment (Evans et al., 2009). It can be anything that people hold in mind and thereby express in either positive or negative way (Bohner & Wanke, 2002 in Alcheva et al., 2009). However, the study of both perceptions and attitudes gain importance as Jain (2004) in Wahyuni (2018) stated that attitude also influences an individual's behavior.

2.2.7.2 Significance of Teacher's Perception

Barcelos (2000) has investigated that teachers' perceptions influence teachers' action in the classrooms. In line with Barcelos, Yu (1986) states that teachers' perceptions will affect whatever teachers do both inside and outside the classrooms. While in more specifically, Candlin and Mercer (2001) examined that teacher's perception towards English play role in determining success or failure of themselves and their students in the teaching and learning situations. This means that perceptions are the basis for teacher to make decision. Therefore, teachers have to be aware of what they perceive and belief in order to conduct the teaching.

2.3 Theoretical Framework

Calhoun and Acocella (1995, p. 285) point out three dimensions of perception,

- (1) Knowledge which refers to what teachers know about EMI, how it is conducted, and also its benefits. The knowledge might come from their educational background or training experiences.
- (2) Expectations which refer to what teachers expect from EMI such as advantages of EMI, how they will conduct EMI in the classroom, also what their motivation and goals in conducting EMI are.
- (3) Evaluation which refers to teachers' conclusion after fulfilling their expectation in conducting EMI such as difficulties that they found and how they cope with them.

Individuals may perceive things either positively or negatively which result in positive or negative perceptions. Those perceptions play crucial role in determining teachers' actions in the teaching and learning process. They will influence the implementation of English as medium of instruction in the classroom.

In the implementation of CLIL classroom, there are four main principles (Coyle et al., 2010). Those principles are known as 4C:

- (1) Content, referring to the teachers' mastery of subject matter so that they can deliver the material well and the learners are able to acquire knowledge, skills, and understanding.

- (2) Communication, referring to teacher's ability to use good communication skill (language skill) and the learners' ability to use the language to interact and communicate with others.
- (3) Cognition, meaning CLIL approach allows both teachers and students to construct the development of their skills in higher-order thinking and understanding, problem solving and also accepting challenges and reflecting on them.
- (4) Culture, CLIL demands tolerance and understanding among teacher and students who probably carry some differences in cultures.

Therefore, in this study, I am going to find out teachers' perceptions towards the use of English as Medium of Instruction (EMI) in teaching mathematics and science and to see how it is implemented in the classroom.

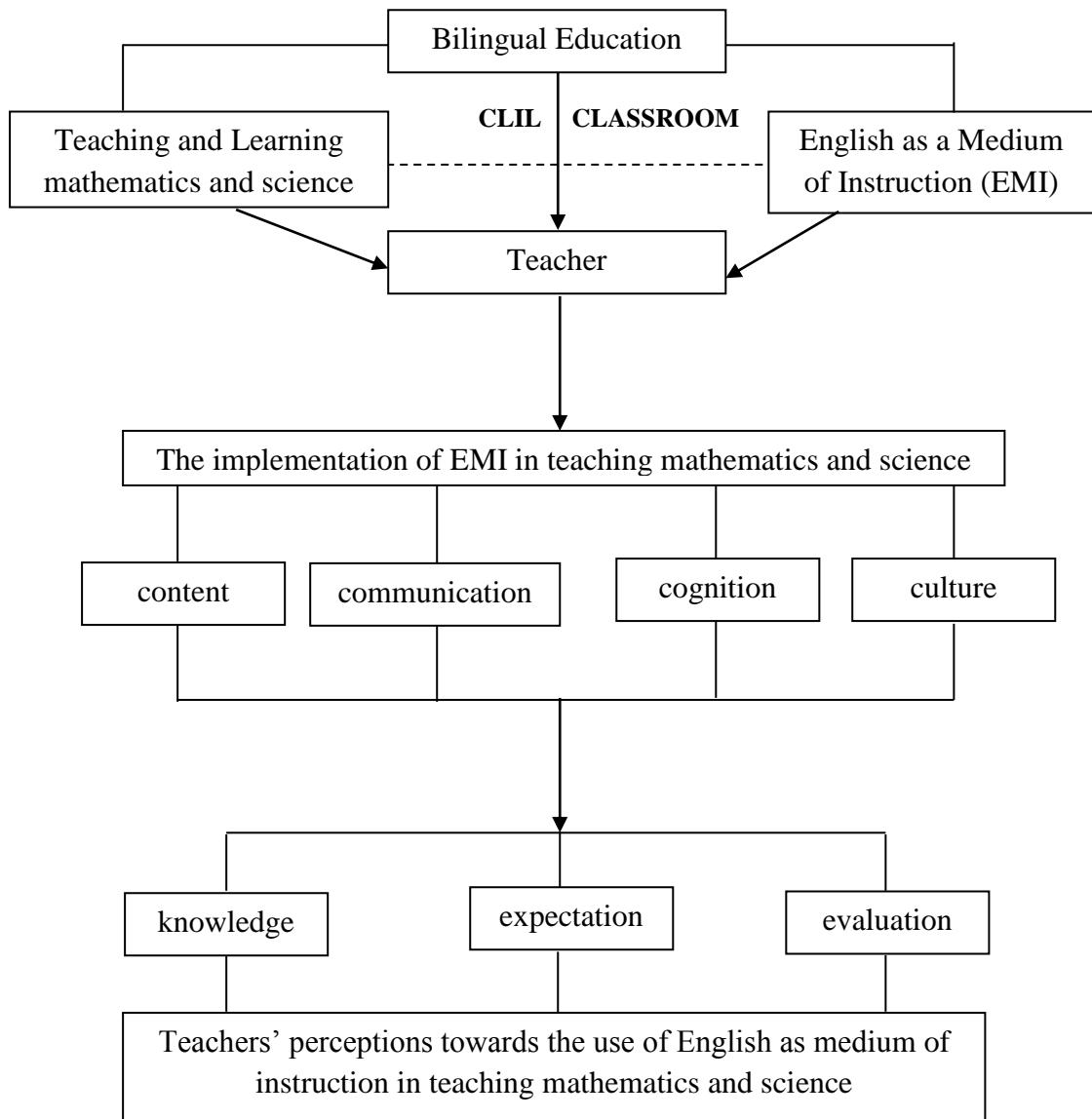


Figure 2.3 The framework of the study

CHAPTER V

CONCLUSIONS AND SUGGESTIONS

In the previous chapters, the writer has discussed the introduction, the review of related literature, the method of investigation and also the findings and discussion of this final project. In this chapter, I present the conclusions and suggestions of this final project.

5.1 Conclusions

This research has investigated mathematics and science teachers' perceptions towards English as a medium of instruction. It can be concluded that based on the principles consisting of content, communication, cognition, and culture, most of the teachers involved in this study have implemented English as medium of instruction in the classroom well. All teachers had no problems in content mastery since all of them have educational and/or training backgrounds in their subject areas. In the cognition principle, all of the teachers were able to teach students with their ability in conducting the instructions well. While in culture aspect, most teachers conducted almost the same culture which was building character education to their students, while the rest had something to do with English enrichment. However, the communication principle, specifically the language use by the teachers, had become one aspect that stood out the most differentiating one teacher to the others. Three teachers were strict in using English in the classroom. While the other three were flexible by switching language into *Bahasa* too often

or even not using English as medium of instruction at all. Besides, those teachers were also too lenient towards their students by allowing them using their first language (*Bahasa*) all the time in the classroom.

Even though some of the teachers who took part in this study had less knowledge related to the theoretical terms, all teachers had positive perceptions towards English as medium of instruction. All of them had the same expectation that by using English as a medium of instruction will help their students to improve their English proficiency which is beneficial for their future lives since English has become an important language to be mastered nowadays. However, some of them evaluated that both they and their students were not proficient enough in English so that they need more effort to develop themselves in terms of skills in the language.

5.2 Suggestions

Based on the conclusion, there were still some difficulties that the teachers face in using English as a medium of instruction. In connection with this case, I would like to give some suggestions. It is suggested to mathematics and science teachers who are still lack of English proficiency to improve their English skill so that they will able to teach their subject matters using English as a medium of instruction in a better way. For the school, the school stakeholders are suggested to provide facility to enrich the teachers' English proficiency such as trainings or scholarships for the teachers to continue their study. Furthermore, the Indonesian government as the policy maker might want to reconsider the possibility of the

reimplementation of English as a medium of instructions in public schools since today it is only applied in private schools.

In addition, this study has shown that some teachers who are supposed to teach content subjects using English still have problems in dealing with the language itself. These issues affected their performances in the classroom where the frequency of them speaking English during the instructional process is still low. To cope with the problems, these teachers are expected to put some efforts in order to improve their English skills. Therefore, the findings show implications to bilingual education in Indonesia that subject teachers of bilingual schools should get a Speaking English for Instructional Purposes workshop so that they will be qualified to use English as medium of instruction to teach their subject areas in a better way. Moreover, the findings of this study give information to lecturers who have expertise in English Language Teaching across Curriculum about the actual situation regarding the implementation of English as a medium of instruction by Indonesian teachers that would inspire them to take an action to help improve Indonesian bilingual education quality.

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