THE USE OF ENGLISH IN THE TEACHING OF MATHEMATICS AND SCIENCE AT R-SMA-BI 1 SITUBONDO

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ABSTRACT: This study involved the Mathematics and Science teachers of grade X of SBI class at R-SMA-BI 1 Situbondo and was intended to describe the use of English in the teaching of Mathematics and Science at R-SMA-BI 1 Situbondo. One of the standards for development in International Standard High School is the use of English for teaching Mathematics and Science. The finding shows that the teachers did not use English in the teaching Mathematics and Science in SBI class. During the teaching process the teachers used Bahasa Indonesia all the time, from opening the class, explaining the subject, and closing, were all done in Bahasa Indonesia. Besides, this study finds out that the teaching of Mathematics and Science in R-SMA-BI 1 Situbondo has not complied the characteristics of SBI class. The use of English in the teaching of Mathematics and Science is not implemented as it was expected in the decree of Minister of Education.

Keywords: Use of English, teaching Mathematics and Science, SBI Class

As a language, English has played an important role as it has been used universally. Graddol (2004:4) states that English has been used as a means of global communication. In time, the development of Indonesian educational system nowadays is implementing RSBI (Pilot International Standard School). One of the set-standard for curriculum development in International Standard High Schools is the use of English for teaching Mathematics and Sciences. As stipulated by the government that International Standard High Schools have to comply with at least two different standards concerning Mathematics and Sciences. Firstly, concerning the learning process, “the quality of learning process must be developed, supported by the application of Information Technology for all subjects and by using English as a means of instruction for Mathematics and Sciences for the Sciences Program” (Direktorat Pembinaan SMA 2009:25). Secondly, about the standard of Mathematics and Sciences teachers, “teachers of Mathematics and Sciences use Indonesian and English language in the teaching and learning activities; and the proportion of the use English in the classroom should be gradually increased to 100% within 4 years” (Direktorat Pembinaan SMA 2009:37).

By using English as a medium of instruction for Mathematics and Science, it is expected that the graduates of Pilot International Senior High School would be able to be prepared for further study in the university level both inside Indonesia or overseas because they will be able to prepare themselves for the university entrance test, to understand English textbooks, and to take part in the lectures presented in English. (Setyorini, A & Sofwan, A: 2011)

There are two popular methods of using English as Medium of Instruction. They are Immersion and Bilingualism (Jayanti: 2008 ). According to Bostwick (2004) language immersion is an approach to foreign language instruction in which the usual curricular activities are conducted in a foreign language. While bilingual education is defined as an education involving two languages as a media of instruction (Burton: 2001).

METHOD
This study was a descriptive research since it is a study that is designed to obtain information concerning the current status of phenomena. In addition, this study is conducted to seek information to assist in decision making and not to test hypotheses (Ary et al., 1979:295). According to Gay (1990: 189) a descriptive study determines and report the way things are. Here, the researcher described the use of English in the teaching of Mathematics and Science in SBI class at R-SMA-BI1 Situbondo.

The researcher conducted this study at R-SMA-BI 1 Situbondo which is located at Jl. P.B. Sudirman 5A, Situbondo, East Java. The school was chosen as the setting of the study based on some considerations. First, the school was chosen regarding the fact that it is a pioneering international standard school (RSBI) in Situbondo and also is the favorite school in the particular town. Second, the school has always managed to achieve 100 percent of graduation rate of the third graders for the national final examination (UAN) except in 2008, and therefore the school is commonly used as the measuring school of the success of education in the particular town. In addition, the school’s reputation is indisputable. The school has always been dominating in many events of competition, both academic and non-academic. The school has succeeded in not only local but also regional, even some national competitions.

The subjects of the study are the teachers of mathematics and science subjects of grade X. The grade X classes are chosen based on the reason that, according to the headmaster, grade X classes are the most well-prepared classes compared to grade XI and XII.

In order to collect the data, there are several instruments used in the present study. The main instrument is the researcher himself as the key-human-instrument to collect and analyze the data. The others are an interview guide, field notes, and a digital camera for recording the teaching activities.

The interview was conducted to gather information about the reasons why the teachers did not use English in teaching mathematics and science. The researcher conducted interview with the teachers during the time the observation was conducted. While the field notes of the researcher played the role as the records of the observations. After collecting all the data needed, the researcher analyzed the data descriptively through the following steps:

1. Organizing and Familiarizing with the Data
   After all the data were obtained, the researcher organized the field notes and the record data. For the recorded data, they were furthermore transcribed into written data in order to be analyzed.

2. Coding
   The data were started to be analyzed. First, the researcher describes how the teaching and learning was going on based on observation and some information obtained from the interview with the teachers. Second, the proportion of English and Bahasa Indonesia was made based on data gained from observation. Third, the researcher described the reasons why the teachers did not use English based on data obtained from the interview with the teachers.

3. Discussing and summarizing the findings
   The use of English done by the subjects of the study are discussed and explained.

FINDINGS
Based on the observation, the researcher found that the mathematics teacher (Teacher A) did not use English in the teaching process. She used Bahasa Indonesia instead. All of classroom interactions were done in Bahasa Indonesia. The same thing happened to the mathematics class taught by Teacher B. Teacher B also did not use English in teaching her lesson. All of classroom interactions in her class were done in Bahasa Indonesia.

In the Physics class taught by Teacher M also happened the same thing as in the mathematics class. Teacher M did not use English during her teaching activities. All of class activities were done in Bahasa Indonesia. This also happened in the physics class taught by Teacher N. The same story repeated in Chemistry and Biology classes. The Chemistry and Biology teachers did not use English in teaching their lessons either. Communication in their classes was done in Bahasa Indonesia.

Knowing that what happened in the field is very different from what it is supposed to be, as it was stated above, the researcher held a brief interview with the teachers. The teachers who were interviewed were both of mathematic teachers, one of the physics teachers, the chemistry teacher, and the biology teacher. During the interview, the researcher asked the teachers why they did not use English while, according to Depdiknas statement, they are supposed to use English as a part of the means of instruction. The teachers gave similar answer; they didn’t use English because they know that they don’t master the language and the logic is, as they said, people cannot make other people understand a subject by using language that they don’t understand.

Besides, they also showed the researcher a copy of letter from the ministry of national education number 553/D.D2/MN/2011. They specifically pointed out two points from the end part of the letter: statement number 2 which states that the use of English as a part of the means of instruction must not decline the quality and the effectiveness of the teaching and learning process; and statement number which states that students’ preparation for English is inflicted upon the English subject itself.

DISCUSSIONS
Method of Using English as a Medium of Instruction in the International Standard Class at R-SMA-BI 1 Situbondo

According to the observations in the mathematics and science class at R-SMA-BI 1 Situbondo, it can be seen that the mathematics and science teachers nearly did not use English at all. Thus, the method of using English as a medium of instruction is neither immersion nor bilingualism.

Miller (1999) explains several characteristics of immersion education. First, immersion education promotes additive bilingualism with sustained and enriched instruction through the minority language and the majority language. Second, subjects are instructed through the minority language occurs for at least 50% of the school day during the elementary school years. Third, teachers are fully proficient in the language they use as the medium of instruction. The last, there is a clear and sustained separation of languages during instructional time. From the statement above, it can be seen that the process of teaching mathematics and science at R-SMA-BI 1 Situbondo fits none of those four categories.

From the observation, the researcher can say that the teaching mathematics and science at R-SMA-BI 1 Situbondo does not fit the characteristic of bilingualism either. Burton (2001:1) defined bilingual education as an education involving two languages as a media of instruction. Therefore, if the mathematics and science
teachers at R-SMA-BI 1 Situbondo applied bilingualism, they would use both Bahasa Indonesia and English as a media of instruction. Yet, from the data gained from observation, the teachers only used Bahasa Indonesia.

**Classroom Language in SBI Class at R-SMA-BI 1 Situbondo**

Classroom language is the language used in a classroom situation. It certainly is a language for special purposes which have to be learned especially. The classroom language itself can be categorized into two major categories (1) teacher talk and (2) student talk. Teacher talk refers to the language produced by the teacher addressed to learners in the course of classroom interaction. While student talk can be defined as the language produced by the student in the course of classroom interaction. In this chapter, the researcher is going to discuss the first category, teacher talk.

If we talk about Indonesian EFL classes, the teacher talk is considered as the main source of input in EFL classes. Here, the teachers commonly use a typical set of classroom language. In contrary, student talk has less significant role as the input of language acquisition. Usually, the student talk appears as the response of the teacher talk.

According to Baradja (1990:63), teacher talk is the manner used by the teacher in the interaction with the students. It has special characteristics, either informal or interactional. One of the formal characteristics is speech modification made by the teacher. Speech modification means the modification of the word choice and structure. In term of interactional characteristics, it includes repetition, using display questions, intonation, and pausing, etc. For the non-native speaker, teacher usually makes linguistics adjustment and interactional modification. Linguistic adjustment includes the use of accurate and standard pronunciation, and short sentences; while interactional modification involves activities such as repetition, prompting, and repairs (clarification request, comprehension check, and confirmation check). These characteristics allow the teacher talk become comprehensible to the students. Another communication strategy which is commonly used by the teacher is code-switching strategy. This strategy is used whenever the teacher gets no response from the students or when the input is not comprehensible to the students.

To a great extent, the language used by teachers and students in a classroom determines what is learned and how learning takes place. According to Milal (2011), there are two functions of teacher talk, namely pedagogical and communicative function. In pedagogical function, the teachers’ utterance will become a model for the students. Moreover, it can also help students to understand the learning material and the instruction. It also has been claimed that instruction in the target language makes a rapid development of language acquisition in second or foreign language learning in communication function (Seliger and Long, 1983:67).

Yet, based on the data gained during observation, the characteristics of classroom language cannot be applied in the teaching of mathematics and science in Standard International Class at R-SMA-BI 1 Situbondo. The teachers who are supposed to be the main source of target language for the students did not speak in English because they do not master the target language. Giving instruction, sequencing, asking and replying questions, and explaining were all done in Bahasa Indonesia.

This, directly and indirectly, affects student talk. Teacher plays important role in classroom language as a main source for the students. If the teacher does not produce speaking in target language, we cannot expect the students to produce
speaking in target language. In this case, in international standard class at R-SMA-BI 1 Situbondo, it’s not surprising that the students did not speak in English since Thus, it can be concluded that classroom language did not happen in international standard class at R-SMA-BI 1 Situbondo.

CONCLUSION AND SUGGESTION

Conclusions

From the findings that are described in the previous chapter, the researcher is able to make some conclusions. First, the teaching of mathematics and science in the International Standard Class in R-SMA-BI 1 Situbondo has not complied the characteristics of International Standard Class. It doesn’t use English as a medium of instruction as the enrichment for the students’ input, and the teachers do not have high English proficiency. Second, the proportion of English and Bahasa Indonesia used by the teachers is constant. Nearly 100% of class conversation was done in Bahasa Indonesia. Third, the main reason why the teachers do not use English in teaching mathematics and science is because they do not master English and they cannot deliver the subject they teach using a language they do not understand. Hence, the researcher can conclude that English has not been implemented in the teaching of Mathematics and Science at R-SMA-BI 1 Situbondo as it is expected in the decree of the Minister of National Education.

Suggestions

In accordance with the above-mentioned conclusions, some suggestions are drawn in order to improve the quality of the International Standard Class in R-SMA-BI 1 Situbondo. First, the school should provide all teachers who teach in International Standard Class with continuous English for Specific Purpose Course in order to improve the teachers’ English proficiency. This is important based on the consideration that the teacher will be the only model for the students in the classroom. Second, the school should improve the facilities for the International Standard Class. For instance, the school can provide an English Self Access Center to facilitate the students as well as the teacher with good English resources. Last, the Mathematics and Science teachers should encourage the use of English as a part of the medium of instruction during the classroom activities. It will be better if the proportion of the English used in the classroom rises gradually.

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