

FACTORS IN ENGLISH COMMUNICATIVE COMPETENCE FOR MATH AND SCIENCE TEACHERS

Dr. Arwemi, M.Pd, Dra. Luli Sari Yustina, M.Pd, Yuhardi, M.Pd

English Lecturers, State Institute of Islamic studies in Padang, INDONESIA

E-mail Address: arwemi.mpd@gmail.com ; lulyregar@gmail.com ; isayuhardi@yahoo.com

ABSTRACT

The objectives of this study are to find out the factors that influence the communicative competence in spoken English, and to find out the solutions to the problems of communicative competence in spoken English for Math and Sciences purposes in teaching and learning process. The respondents are the Math and Sciences teachers in RSBI SMAN X Padang. This study applies a qualitative evaluation approach. Data were collected through observations, recordings, interviews. The findings of the research are (1) The interviews and observations result showed that the internal factors (motivation, attitudes, and learning strategies) and external factors (family, school, and local community) were the causes of the communicative competence problem of Sciences teachers in learning and teaching process. The problems from internal factors were negative attitudes, low motivation and bad strategy in learning English language complete with the lack of encouragement from family, and more specific from the school environment and the government that has cause of the problem of communicative competence of Sciences teachers in using English as a learning language; (2) The solution is by optimizing the support both from internal and eksternal factors, like; improving good attitude towards English, it requires the awareness process, improving the motivation that needs support from external factors such as reward and punishment from school management, using the right learning strategy, it is needed the family as well as the government policy and society surrounding supports.

Keywords: *communicative competence, teaching Math and sciences in English, internal and external factors*

INTRODUCTION

There are several factors that should be considered to improve English communicative competence for math and science teachers since they taught using English language. These two factors, internal and external, of communicative competence determine the success of teaching-and-learning process in the classroom. The internal factors include attitude of teachers toward English, motivation to learn English, and the strategy of learning English. In other side the external factors include attention from school management and government in this case The Ministry of Education and Culture of Indonesia, attention from the family point of view, and society where the school exists. Both of these factors really play important roles in the success of math and science teachers in using English at prestigious international class.

The ability of someone using English communicatively is influenced by several factors, like: language competence and the capacity of using the competence in daily life. There are 2 things that are needed if someone would like to improve using English: increasing the ability of vocabulary, spelling, content and English grammatical structure; and also increasing the capacity of using it in daily communication.

According to Celce-Murcia, Dornyei, and Thurrell (1995: 10) that is concluded by the curriculum 2004 of English subject (Departemen Pendidikan Nasional, 2004:71) stated that the good communication happened if both the speaker and his speaking partner have mutual understanding, whether as communicator or as communicant, then also followed by the appropriate media. Moreover, there are several competences that are needed in doing communication; discourse competence is mentioned to be the main part.

The first communicative competence is linguistic competence. An individual who mastered the linguistic competence would have a good mastery of vocabulary, pronunciation, meaning, and grammar. A teacher, who teaches his students in English and masters these aspects, basically has fulfilled one fifth of his overall obligation. So naturally it's the duty of the teacher to take a really mature preparation and if not his knowledge will just slipped.

On the other hand, if the students already have the ability to use these elements in real communication such as shopping, acquaintance, etc., they have mastered the illocutionary-act competence. In other words, as a follow-up of linguistic abilities that have been submitted by the teacher earlier, it is not difficult if this rule goes as it should, in the term of irregular or gradual basis.

Another competence that makes up the communicative competence is the socio-cultural competence. This means that a learner is not only required to master the elements of language and the ability to apply them in the active communication, but also able to perform such communication in the right socio-cultural context. Speaking in public spiritfully but if the speaker forgot the context of socio-cultural, shadowed or untouched, it will result in unacceptable or misunderstood messages. Last but not least, the learner must be able to maintain the pace of his communication to success in achieving the desired communication. This competence is called strategic competence. These stages of communicative competence must be passed correctly and precisely.

Further Hymes (1972: 283) describes the use of language as follows: a person is not identical to the performance of the behavior per se, in many respects depends on the interaction between competence, competencies mastered the science of language, the ability to use the language of science itself, as well as other competencies needed. The same thing also expressed by Savignon (1983: 8-9) concerning the communication characteristics as follows: dynamic, depending on the suitability of meaning between two or more people involved, occurred in a particular context. Communication occurs in a variety of situations, and its success depends also on an understanding of the context and previous experience (early) in the same way.

Canale and Swin (1980) says that there are four components namely Communicative competence: grammatical, discourse, sociolinguistic, and strategic competence. Furthermore, Canale and Swain added that, "In this case, Canale and Swin confirms that there are four components of communicative competence, such as grammatical competence, discourse, sociolinguistic, and strategic competence. Canale classifying grammar competence and discourse competence as language usage. Here, competence includes knowledge structure grammar phoneme, morpheme and syntax rules. While the discourse of competence includes the ability to connect between sentences to achieve communicative goals.

Clearly, these four competencies will be a solid foundation for the creation of discourse competence. For the success of developing these four competences (linguistic, socio-linguistic, strategic, illocutionary-act, and discourse competences) is required to build communicative competence.

Bachman (1990:82) emphasizes the importance of context in the English language: "A more serious limitation of the skill / components models was its failure to recognize the full context of language use-contexts of discourse and situation." This is supported by Van Dijk's (1977) who reveals the importance of the relationship of text and context, details the importance of introducing discourse relations in the context of the English language. In addition Hymes stressed the importance of sociocultural factors in addressing the situation, the context of the importance of the proper use of the phrase (1972, 1973, 1982).

Bachman (1990: 84) says there are several things that must be held by a person to acquire communicative language skills, namely, the science of language itself, and apply these skills to use it properly and contextually. He further added communicative capability consists of three components: language competence, strategic competence, and psychophysiological mechanism.

Categories of sociolinguistic competence and strategic competence belong to language use. Sociolinguistic competence includes the ability to use language well and with the right situation, including precise in their choice of words and knowing when to speak. The term competence is used as a strategy in the mental capacity to implement the components of language competence in the context of the communicative use of language.

This research is based on Bachman (1990) that was supported by Weir (1990). According to Bachman (1990), it is not easy to measure English communicative competence, but the following indicators: appropriateness, grammar, vocabulary, fluency, and pronunciation can be used. This opinion is supported by Weir (1990: 147) by giving the criteria of assessment that are needed.

METHOD

This research belongs to descriptive qualitative. It describes the phenomenon in teaching and learning process in the classroom. Descriptive research included collected the data that is related to subject nowadays. (Gay, 1992). This research also belongs to qualitative because it tries to understand human being and his behaviors (Burn, 1995), that is to know what factors of English communicative competence in using English for math and sciences teachers. Subject of this research is math and sciences teachers at SMA A Padang. Data collected by using interview. The data is analysed by using descriptive qualitative, that is by describing the data based on research questions and explain it using words to get the meaning.

FINDINGS AND INTREPRETATION

1. The importance of English Communicative Competence for Teachers of Mathematics and Science Teachers

The importance of communicative competence in English for Mathematics and Science teachers who teach in the classroom is perceived internationally as teachers in their interaction with students and demanding equal understanding of the message delivered to the encoding of the communicator (Mathematics teacher) can be accepted in decoding by the communicant (students) well.

Based on the results it can be seen some problems in spoken English communicative competence in the teaching of Mathematics and Science teacher at SMAN A International Class Padang. Problems of spoken English communicative competence in the teaching of Mathematics and Science teachers located almost on all components of communication skills: accuracy, vocabulary, grammar, intelligibility, and fluency. However, according to the researchers the most problematic component is in the component of vocabulary, grammar and accuracy.

Among the three learning situations studied—pre-teaching, while-teaching, and post teaching—the problems of English spoken communicative competence of teachers of Mathematics is the biggest in the situation of while-teaching and post-teaching. In the situation when teachers is short in knowing vocabulary related to the subject matter, the teacher looked confused in using English grammar, frequent patterns looked out of control, while the teacher looks at the accuracy of the difficulties in the English language, giving rise to misunderstanding in the appropriate meaning. While in the post-teaching situation, researchers saw the main problem lies in the lack of teachers believe in their own English capability. This is due to the influence of the perceived difficulties of teachers in the while-teaching situation. In other words, the current problem of while-teaching gave a negative impact on teacher confidence in using the English language at the time of closing the lesson.

Required mastery of English vocabularies associated with the subject matter added problems to the selection of the right words in accordance with the demands of academic tasks. Teachers must know how to use the English language based on English grammar either by making a sentence that can be understood by students. Mathematics teachers are required to develop their ideas by not infringing the rules of English grammar so that students can catch the teacher's explanation. It is intended that all of the interaction between teachers and students must be good, so there is no mistake in interpreting what the teacher intended.

Inevitably sciences teachers must master English for Specific Purposes for each subject of sciences (math, biology, chemistry and physics). Admittedly, it is not easy to master the ESP for

Mathematics and Science teachers before mastering English in General. In other words, the teacher must be able to speak English Mathematics in General first before mastering English for Specific Purpose in explaining the subject matter in the learning of Mathematics. However teachers who master the concept of communicative competence in English must be able to interact well with the students in the learning of Mathematics.

Of the four teachers teaching sciences, Chemistry teacher classified as the most problematic in communicative competence in English. Almost all of the components of communicative competence are problematic; accuracy, vocabulary, grammar, pronunciation, and fluency. Of the five components of communicative competence examined, it can be sorted most problematic components ranging from vocabulary, grammar, accuracy, fluency and pronunciation. Components of vocabulary, grammar and accuracy are the most visible component of the perceived problems in this teacher.

Disruption of the interaction between teachers and students in the lesson is explained due to problems between components in communicative competence in English. Bachman (1990: 84) said there are several things that must be owned by a person to acquire communicative language skills, namely; knowledge about the language itself, and apply those capabilities to use it appropriately and contextually. He further added communicative capability consists of three components: language competence, strategic competence, and psycho-physiological mechanism.

Hymes (1972: 283) described the use of language as the following: the performance of a person is not identical with mere behavior, in many respects depends on the interaction between competence, competence to master the science of language, the ability to use the language of science itself, as well as other competencies needed. The same thing also expressed by Savignon (1983: 8-9) with respect to the characteristics of communication as follows: dynamic, depending on the suitability of meaning between two or more people involved, occurs in a particular context. Communication occurs in varied circumstances, and its success depends also on the understanding of the context and previous experience (early) in the same way.

As said by Celce & Murcia Dornyei and Thurrel (1995: 10) that the communicative competence is necessary to gain "understanding" between the communicator (in the information) to the communicant (receiver of information). In this case the teacher is the information giver and the student is the recipient of the information. Teachers convey messages / information / explanation lessons can be well understood by the students as a communicant. If it does not happen, there will be a "misunderstanding", missing meanings of one's message.

Biology and math teacher had a similar level of problems. The main difficulty lies in the vocabulary of components, including grammar (grammar) and accuracy in while-teaching session. Other components are still problematic, such as; pronunciation and fluency. However, compared to the teacher of chemistry, biology and mathematics teachers can be categorized better. The use of the English language both more frequent and more of the message can be understood by students. While the physics teacher is a teacher who consistently used English in every situation of learning: pre, while and post teaching. The teacher hardly troubled on every component of communicative competence, even there are no significant errors. However, with notes, physics teacher remained also problematic components pronunciation, and fluency. The second Note: Data on the use of English in teaching by teachers of physics derived from CD recordings made in preparation for the Australian Sister School Program of SMAN 10 Padang.

All teachers of Mathematics and Science are almost no problem with all the components of language competence in pre-teaching situation. Basically, all the teachers of sciences have the same communicative competence problem, i.e. the components of vocabulary, grammar, accuracy, pronunciation, and fluency (in accordance with the order of difficulty). This problem is most prevalent on

the situation while-teaching. As for the post-teaching situation, in which teachers interact more with the English in General, problems of Mathematics and Science teachers basically lies in the lack of confidence to use English, because of the influence of perceived difficulties in the situation of while-teaching.

2. Factors of Spoken English Communicative Competence for Teachers of Mathematics and Science in Learning and Teaching Process.

All of the Mathematics and Sciences teachers have problems in spoken English communicative competence. This happens because there are underlying factors, namely; attitude, motivation, learning strategies, as internal factors; coupled with a reduction in, or absence of another good external factors such as family environment, school either in the form of incentives, rewards, or punishments (families, schools and government, and society). These factors have reduced the spirit of Mathematics and Science teachers to increase the capacity use of English in teaching.

Internal factors, such as attitude, almost all teachers of Mathematics and Science were being negative or being half-hearted in their use of English. It is said behaving negatively because teachers are not happy to speak English, there is some reluctance to use it, not confident because students' English are better than the teachers' as experienced by chemistry teachers. This is all the cause of the problem in spoken English communicative competence of teachers in international class.

According to Oxford (1990: 140), the affective side of the learner is a very important influence on the success and failure of language learning. Affective factors associated with learning a second language or a foreign language is emotional, self-esteem, attitude, empathy, and motivation. Learning a second language or a foreign language is a complex task where many things related to the human side involved. Things like not feeling comfortable (less comfortable), frustration, embarrassment, fear of public speaking, these are the obstacles often faced by adults who learn a second language.

Mathematics teacher is said to be half-hearted towards the use of English because basically this teacher likes and able to communicate in English, but due to several reasons, including; difficulty achieving learning objectives, limited time, or because of student demand pretext that burdened the understanding of the material when the teacher speaks English lead teacher to prefers speaking Indonesia in the international class except at certain times, e.g.; any inspection (unannounced) of national education, for the purpose of recording a CD if at any needed time, or like when researchers conducted observations in the classroom. All of this is causing a problem of communicative competence in the teaching of Mathematics and Science teachers at international class. Likewise with the factor of motivation and learning strategies, the negative attitude of teachers of Mathematics and Science will affect the low motivation in communicating in English. It is the unconscious bad strategies teachers use in the classroom internationally, such as; easily switching to using Indonesian when hit with a certain vocabulary, less willing to practice English and not sparing time to increase the capacity use of English, more preferring reading and reference books in Indonesian language than English, etc..

While external factors that cause problems of communicative competence in the teaching of Mathematics and Science is the lack of encouragement from the environment, good family, school or government and of the local community. In the family, for example, lack of encouragement or financial support, disapproval when using English at home and reluctant to use English because they do not respond very well cause the existence of problem in English communicative competence of teachers of Mathematics and Science. Rusyana (1989, 31-32) stated that the attitude of a language community or a language speaker that both are bilingual and multi-linguist will a tangible sense of pride or mock, reject or accept at the same time a particular language or a particular language user community, both the language controlled by any individual or by members of the public. It was something to do with the status of

language in society, including the political and economic status. Similarly, the use of language associated with the lives of specific groups is often stereotyped as a language is not only a communication tool but also a social identity.

In addition to schools and government factors are no longer paying attention to the class international and government encouragement of the use of English in the teaching of Mathematics and Science teachers are the main causes of communicative competence in the teaching of Mathematics and Science teachers at international class of SMAN A Padang.

Klein (1986) divides the dimension of second language acquisition to six. They are: propensity, Language Faculty, Access, Structure, Tempo, and End-State. In this case, the need to be underlined is the propensity that is interpreted as a kind of insistence or underlying motive someone learning a second language (motivation). Klein propensity further divides into four kinds of social integrity, communicative needs, attitudes, and education.

Departing from international education plan, there should be a maximum boost of all stakeholders concerned. In this case the Ministry of National Government should motivate, encourage and monitor every program of international school up to the process of learning inside of the schools. Ideally it should be monitoring up to class. School management and all the elements in the school, such as school principals, school committee should support each program. There should be an effort to increase such programs; comparative studies, training, overseas to countries that use the English language, such as to Australia. Unfortunately all the supporting factors are no longer at the end of the program period of international school.

Learning Mathematics used English in SMAN A Padang relatively not running smoothly. Percentage of teachers who taught Mathematics and Science in English is very small and has not increased over the six years of international school. From 26, the number of teachers of Mathematics and Science in SMAN A Padang, only 4 people who taught English. They consist of 2 civil servant teachers (chemistry and mathematics) and 2 more from biology teacher (teacher salaries of non-civil servants) and a physics teacher (retired).

3. Solutions

It is required a deep understanding of the importance of communicative competence in English language learning of Mathematics and Science teachers since it was an international class. Person's ability to use English communicatively influenced by several things, such as; language competence, and capacity to use these competencies in everyday life. There are two things to note when someone wants to improve its ability to use the English language, which is to increase knowledge of language, including; improve vocabulary, pronunciation, meaning, and English grammar, as well as increasing the capacity of its use in everyday communication. There are several necessary solution to improve the communicative competence of teachers of Mathematics and Science in English language learning:

- a. It is a must to correct the factors that contribute to the improvement of oral English competency of teachers of Mathematics. They include to repair the attitude, motivation, learning strategies, support families, schools and communities. All it requires a process of awareness about quality of educational system as to obtain optimally support.
- b. The government should have a commitment to sincerely encourage to every program of international school and never did try and error of educational system related to learning English and make the whole places subjects lay English lessons.
- c. Governments must put English as a foreign language into a second language. In Indonesia, the position of English is still as a foreign language (English as a Foreign Language). English

communication skills will be optimally achieved if English is used as a second language after Indonesian, not as a foreign language.

- d. There should be regulations / rules that bind the educational system to use English as a second language, as it is done by Malaysia or such use of the Dutch language before Indonesia independence.
- e. The use of English as a second language must take place so that there are circumstances that the systemic forces teachers to speak English fully.
- f. There should be a reward and punishment to English as a second language to obtain optimal drive of the system and management education.
- g. System of reward and punishment must be integral, which fosters a positive attitude, motivating to all users of the language, not temporal, incidental, and sincerely heart, which is only a fraction motivating speakers at infinite time, so that it can improve communication skills when reward and punishment performing well. This will make most people become optimistic and apathetic because they feel will get the chance.
- h. However, if the above cannot be reached, then the study is significant for the future of education in Indonesia so as not to confuse learning English as a foreign language with an increase in the educational system. Learning Mathematics + combined English is a job that weakens both. Learning Mathematics and English will never be optimal. Learning English in Indonesia should remain exclusive as learning a foreign language. Indonesian remains as an introduction to English language education and controlled participant is also optimal. In order for the educational system does not use English as a commodity image enhancement internationalization of education.

CONCLUSION AND SUGGESTION

The communicative competence of sciences and math teachers to teach in English is not optimalize even it has been done along 6 years more.

There are many factors that should be considered in communicative competence directly or not, like; the internal factors from both participants, teachers and students, such as, motivation, attitude, support, learning atmosphere and English study experience, while the external factors, like; support from the school managements, improve sufficient of learning resources, need an extra attention and more insentive from head master, local and central government, students' parents.

The solusion is by optimazing support both from internal and eksternal factors, they are; improving good attitude towards English, improving the motivation, using the right startegy, it is needed the family, giverment policy and society surrounding supports.

ACKNOWLEDGEMENT

We thank all the students and teachers in RSBI SMAN X Padang who participated in this study. We also express our gratitude to the Head of Department of for supporting this research.

REFERENCES

- Bachman, L. F. (1990). *Fundamental Consideration in Language Testing*. Oxford: Oxford University Press.
- Bachman, L. F. (1990). *Language Testing in Practice, Oxford Applied Linguistics*. NewYork: Oxford University Press.
- Canale, M. and Swain, M.. (1980). *Theoretical Bases of Communicative Approaches to Second Language Teaching and Testing*. Applied Linguistics, 1: 1-47.
- Celce- Murcia, M., Z. Dornyei, S. Thurell. (1995). *Communicative Competence: A Pedagogically Motivated Model with Content Specifications*. In Issues in Applied Linguistics, pp 5-35.

Depdiknas (Departemen Pendidikan Nasional). (2004). *Pedoman Penjaminan Mutu Sekolah/Madrasah Bertaraf Internasional jenjang Pendidikan Dasar dan Menengah*. Jakarta: Direktorat Tenaga Kependidikan, Direktorat Jenderal Peningkatan Mutu Pendidik dan Tenaga Kependidikan, Departemen Pendidikan Nasional.

Klein, W. (1986). *Second language acquisition*. Cambridge: Cambridge University Press. 167pp.

Oxford, R.L. (1990). *Language Learning Strategies: What Every Teacher Should Know*. New York: Newbury House.

Oxford, R.L. (1990). *Language Learning Strategies*. New York: Heinle & Heinle Publisher.

Weir, C. J. (1990). *Communicative Language Testing*. New York: Prentice Hall.

ABOUT THE AUTHORS

Dr. Arwemi, M.Pd is a current lecturer in English Teaching Department in Tarbiyah Faculty at IAIN Imam Bonjol Padang. She was graduated from Doctoral Degree in Educational Program of Padang State University in 2014. In 2011, she was included in Sandwich Program to Ohio State University. She presented her doctoral disertation proposal and did a comparative study there.

Dra. Luli Sari Yustina, M.Pd is a current lecturer in English Teaching Department in Tarbiyah Faculty at IAIN Imam Bonjol Padang. She was graduated from Master Degree in Padang State University in 1999. She went to IOE London for Sandwich Program in 2008.

Yuhardi, M.Pd is a current lecturer in English Teaching Department in Tarbiyah Faculty at IAIN Imam Bonjol Padang. He was graduated from Master Degree in UPI Bandung in 2009. He attended workshop in McGill University, Qubeq, Canada in 1997. This paper is his second Teflin paper participation.