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## Pedagogical Strategies and Content Knowledge of the Teacher of English for Maths in the Context of Content-Based Instruction

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### Abstract

Teacher is a key person in teaching and learning process. The teacher must have good strategies to teach, they also have to know the goals to reach success and how they set the students realizing those goals. Besides, content knowledge is crucial owned by a teacher to create meaningful learning for students especially in Content-Based Instruction teaching and learning context. It becomes an issue once new idea to maximize the learning process and results. This study was intended to find the pedagogical strategies applied by the teacher in the teaching learning process and to know teacher's content knowledge, how teacher need to understand the subject matter taught. This study was carried out in English for Maths subject of Mathematics education study program IKIP PGRI Bojonegoro which involved the teacher and the students as the respondent. This study is under qualitative case study. In collecting the data, questionnaire, observation and interview were conducted to get detail information of the issues. The result reveals: 1) the teacher combines some methods such as cooperative learning, problem-based learning and task-based learning to get the students enthusiasm; 2) based on teacher's educational background, although the teacher graduated from Bachelor Degree of English Education but she was able to combine English teaching through mathematics content very well. It can be concluded that Teacher's pedagogical strategy and content knowledge is very important in the application of content-based instruction teaching and learning.

**Keywords:** Content-based instruction, content knowledge, pedagogical strategy.

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### Introduction

Content-Based Instruction is a powerful innovation in acquiring and enhancing a language. In its best form, language lessons are blended with stimulating content. The

students focus on the subject matter than the language learning process. Supporting students' success by engaging them in challenging and innovative activity helps them learn complex skills. The students learn

language automatically. Keeping the students motivated and interested in the language training is the profound advantage of CBI. When students are interested and motivated in the material they are learning. They make greater connections to life situations, learning language becomes a fun and easy activity, information is retained for long time.

CBI supports contextualized learning; students are taught useful language that is embedded within relevant discourse contexts rather than as isolated language fragments (Duenas, 2004).

Teaching the Content-Based approach requires a large amount of work and energy. The teacher has to fulfil several roles, such as being a good language teacher and in addition having an appropriate knowledge of the subject matter. Teachers' education a complex issue in CBI and students in a CBI class is supposed to learn the target language and some concept related to the content at the same time. It means that the teacher should be knowledgeable in the two areas and effectively combine language and content instruction (Crandall, 1999). According to Crandall (1999), teacher who are teach the target language with CBI have to be trained in the place where specialized teacher training normally is conducted.

Moreover, the integration of pedagogical strategy and content knowledge in content-based teaching is a highly complex cognitive activity in which the teacher must apply knowledge from multiple domains (Resnick, 1987). Teachers with differentiated and integrated knowledge will have greater ability than those whose knowledge is limited and fragmented, to plan and enact lessons that help students develop deep and integrated understanding. Given the importance of teacher knowledge

for student progress, teacher education can be regarded as a key target and lever of educational reform. However, the understanding of how teacher education programs affect the development of professional knowledge remains limited (Cochran-Smith & Zeichner, 2005). Based on the requirement that in content-based instruction teaching and learning, the teacher should have English background of education, they have to be able to mastery the content subject. But sometimes their background education isn't suitable with the subject matter which is taught.

Professional teachers are they who have good pedagogical strategies and also content knowledge. Ball & Bash (2003) stated that teacher with good strategies can be seen from the kinds of questions teacher ask, the way they respond to student, their expectations of and attitudes toward students, their classroom management technique, their teaching methods, and their teaching general behavior. Good teachers should have good strategies, they have to know the goals which they plan to reach success and how they set students realizing those goals. Based those facts, teachers are required to create good strategies in the preparation of teaching and the process of teaching itself. Every teacher has to arrange teaching strategies, so learning interaction in classroom can be interactive, inspiring, interesting, challenging and motivating for students participate in the classroom, and learning goals can be achieved.

Then, teacher also should have a good content knowledge. The term was first introduced by Lee Shulman. Content knowledge, describes a teacher's understanding of the structures of his or her domain. According to Shulman (1986), the

teacher must further understand why it is so which implies that teachers' content knowledge should represent a deep understanding of the material to be mastered by the students. In this case, content knowledge is a teachers' understanding about the subject matter that he or she taught. Content knowledge is crucial to be owned by a teacher to create meaningful learning for students. It becomes an issue once new idea to maximize the learning process and results.

This study was intended to identify the pedagogical strategies which the teacher applying in the teaching learning process and to know teacher's content knowledge which deals with how teachers need to understand the content or matter which is taught. This study is carry out in English for math subject and involves the first year students Mathematic Study Program of IKIP PGRI Bojonegoro in 2016/2017 academic years.

### **Methodology**

The design of this research was a qualitative case study. The data were dig up from the teacher and the first year students in English for maths class of Mathematic Study Program IKIP PGRI Bojonegoro. Here, the data were obtained from observing two meetings in June 2017 to get the data of pedagogical strategy, interviewed the teacher and some students that randomly chosen, and also distributing the questionnaire to know the content knowledge. The researcher used an interactive model of analysis proposed by Miles and Huberman (1994). In analyzing data, the three main components were data reduction, data display, conclusion drawing/ verification. In this research there were some strategies used to obtain the trustworthiness of the data. Those strategies were used to check accuracy or validity the findings of the research.

Creswell (2007) mentions eight strategies of verifying the trustworthiness of the research. From the eight strategies proposed, the researcher used data and method of triangulation.

### **Results and Discussion**

#### ***Pedagogical Strategies***

After the observation and interview conducted, there are three strategies which often used by the teacher in teaching English for Maths, they are; cooperative learning, problem based learning and inquiry learning strategy.

#### *Cooperative learning.*

One of the teaching strategies which used by the teacher is cooperative learning. Cooperative learning has been proven to be effective for all types of students, including academically, because it promotes learning and fosters, respect and friendships among differs group as students. In the teaching and learning activities the teacher divide the students randomly (heterogen). One group consists of two until three member. Through the division of the group, the assessment applied against the groups. The teacher will give a reward for the first three groups whom able to finish the problem correctly. The teacher applied games, she gives an instruction for the rules and also give the same opportunity to the students in the games. After every member got the opportunity, the teacher give time to discuss and do the assignment together. When the discussion is going on, the atmosphere becomes crowded because the students are arguing and exchanging their ideas.

#### *Problem-based learning*

Besides cooperative learning, the teacher also usually used problem-based learning strategy in teaching English for

maths. Problem based learning is a teaching strategy which is the students actively against a complex problem in real situation. During the elaboration step, the teacher often gives an individual assignment through worksheet as the main teaching materials in this subject. The content of the worksheet is the material discussed and the students' assignment. In learning English for maths, the students should do a lot of practices which meant here are mathematics problems which delivered in English. It is an application of "learning by doing" which can improve the students' critical thinking and their experience. Sometimes the teacher used real objects, videos, pictures, also power point presentation to make the students interested and understanding related to the topic discuss. The students doing the assignment by the guidance of the teacher

#### *Inquiry-learning strategy*

One of the learning strategies that provide an opportunity for students to find their own knowledge and play an active role in learning so as to understand the concept well and develop the ability to think critically is an inquiry learning strategy. In this strategy, the teacher applied guessing or questions answer method. Applying the right questions by teachers will stimulate students' creativity and help them in finding new knowledge. When the teacher asks questions, almost all students enthusiastically try to answer the question by raising his hand. Then the teacher appoints several students in turn to express his ideas or opinions in English. Furthermore, the teacher gives an explanation and discusses the material with the students. This learning strategy is very effectively applied in the classroom where the number of students is not more than 30 people. Therefore, students are able to play an active

role, thinking critically, analyze and solve their problems.

#### *Content-Knowledge*

From the observation and the questionnaire responses by the teacher, the researcher had found the research findings about content knowledge of Maths teacher. There are two components are included in this findings, they are; (1) Characteristics of the teacher, and (2) Teacher's educational background. Good teachers are made up of a combination of hundreds of qualities that allow them to do their job effectively in teaching. There is no denying that all teachers have their own unique natural of qualities. That why each teacher has their own characteristic in the way of teaching.

#### *Characteristics of the teacher*

The teacher has a good discipline attitude such as she always comes in time to the school. The teacher rushes off to the class and come on time. Before the teacher starts teaching, she always has a good preparation which as the implementation of teaching strategies to take students' prior knowledge to account when planning syllabus and teaching, also create lesson plan, determine the methods, the materials and media that will be used in teaching. In this case, the teacher as an organizer is able to organize the components of teaching and learning activities. So, the learning activities run effective and efficient. The core meaning of pedagogical content knowledge is best represented by Shulman (1986, pp. 9) original definition, which states that pedagogical content knowledge includes knowledge on how best to represent and formulate the subject to make it comprehensible to others, as well as knowledge on students' subject-

specific conceptions and misconceptions (see also Grossman, 1990).

The teacher always greets with smiling and excited to start the lesson. It can melt and warm the atmosphere in the class. So, the students being ready mentally and interested to follow the learning activities. Then, the teacher develop the students' conceptual understanding toward English and provide a widely scope inside in mathematics concept. Then he always makes a connection between English, mathematics and the other discipline. He also provides a certain strategies which appropriate with mathematics lesson, they are; cooperative learning, problem based learning, and inquiry learning strategy. Content knowledge, on the other hand, describes a teacher's understanding of the structures of his or her domain. According to Shulman, "The teacher need not only understand *that* something is so, the teacher must further understand *why* it is so" (Shulman, 1986, p. 9), which implies that teachers' content knowledge should represent a deep understanding of the material to be mastered by the students.

In an effort to attract attention and motivation of the students, The teacher often use some stimulus such as guessing, games, video, props, etc. She has a patient attitude in trying to provoke the students' responses. The teacher as a facilitator, she facilitates the occurrence of interaction as well as the teacher and the students, also the environment and other learning sources. It trains students to seek the information about the topic of the materials through exploration which students are able to deliver their ideas and the bravely in speaking English.

Besides, she has a good management in teaching a group of students which has many different characters. Each student has a

different family background, skill, gender, nature, and so on. The teacher treats all students equally that they get the same material, the same tasks as well as the facilities. But, sometimes the teacher need to give special treatment to each individual according to their character and needs so that teacher are not only able to give general treatment to each group or learning level, but the teacher is also able to give special treatment to each individual. For example in a study group there is a student who always get a low score compared to other students, and less able to follow the lesson then the teacher needs to know the difference, find out the cause, and also give special treatment to the learners so as not to be left behind with other students in terms of learn. Furthermore, the teacher has a good skill while he explains and discusses the material to the students. The teacher uses English as an instructional language in teaching English for Mathematics, but she can communicate with them. Teacher always give more attention in determining and choosing the words that simple and always use in every day.

The teacher is not bound by the textbook, She uses a worksheet as the main in English for Maths. She is required to create the worksheet by himself which the worksheet was created by taking from a variety of sources, especially he always uses some books as the learning sources. Teacher also uses pictures, props, videos as the media in deliver the material to make the students have a good understanding. She is also applied a variety of interesting and fun methods that often used. She is able to mix or combine two or three methods in one meeting which suitable with the topic discussed. In this case, the teacher's teaching skill will

always be sharpened. So, he has a good skills and high creativity to present her material.

*Teacher's educational background*

Here, it will discuss about the English for Maths teacher's educational background related with the understanding of the subject that he taught. When teachers think the best way to improve their teaching is by developing their content knowledge, they end up with sophisticated levels of knowledge, but they have only simplistic instructional methods to convey that material. To imagine that content matters more than process is to imagine that the car is more important than the road. Both are essential, what we teach and how we teach it are inextricably linked and very much dependent on one another. This is in line with findings from expertise research in other domains, which show that teachers' knowledge bases are usually not only more extensive than those of novices, but also more connected and integrated (Chi et al., 1981; Schmidt & Boshuizen, 1992; Simon & Chase, 1973). Whether or not teachers' pedagogical content knowledge and content knowledge are separable categories of knowledge may therefore be a function of different levels of expertise.

Based on the data gain from the interview conducted the researcher found that the English for maths teacher graduated from bachelor degree of Mathematic Education Department of IKIP PGRI Bojonegoro. Based on his background education, it is far different with subject that he taught that is English. Then the researcher focus to observe the teacher's understanding about English lesson. Besides the teaching and learning activities, there are some activities that regularly done by her to improve his skill and his professionalism as English teacher. In a week, all the teachers have a routine

schedules in Saturday. They arrange a meeting which aims to examine and evaluate the teacher's teaching ability. She also has a meeting with the other English teacher from other study program to discussing and planning the teaching and learning activities, the learning strategies, learning media, and others. It is about twice until three times in a week. She also frequently attended seminars, conferences or other activities that be able to improve her skill.

**Conclusion**

Based on the research findings and its discussion, the researcher comes to conclude several things. The first is pedagogical strategies that used by the teacher are; Cooperative Strategy, Problem Based Learning. The main goal of content-based teaching is enable the students to use English as their communication language through various learning activities and learning materials. Related to that goal, the English teacher is able to use the various methods and media which interesting and fun to teach. Furthermore, during the teaching and learning process the teacher show good attitudes as the ideal characteristics of teacher, they are; discipline, enthusiasm, friendly, creative, well-dressed and polite, has a good management class and time.

Based the background education of the teacher, although the teacher was graduated from Bachelor Degree of Mathematics Education Department but she mastered English very well. It is based on the implementation of the teaching strategies used by the teacher in teaching English for Maths class, the students become active learners who able to play an active role, thinking critically, analyzing and solving the problems. Besides that, they can use English to communicate

with the teacher and their friends during the teaching and learning process.

## References

- Ball, D. L., & Bass, H. 2003. Toward a practice-based theory of mathematical knowledge for teaching. In B. Davis & E. Simmt (Eds.), *Proceedings of the 2002 annual meeting of the Canadian Mathematics Education Study Group* (pp. 3-14). Edmonton, AB: CMESG/GDEDM.
- Chi, M. T. H., Feltovich, P. J., & Glaser, R. 1981. Categorization and representation of physics problems by experts and novices. *Cognitive Science*, 5, 121–152.
- Cochran-Smith, M., & Zeichner, K. M. 2005. *Teacher education. The report of the AERA Panel on Research and Teacher Education*. Mahwah, NJ: Lawrence Erlbaum.
- Crandal, J. 1999. Content-Centered Language Learning. Retrieved from: ERIC: <https://eric.ed.gov/?q=Content-centered+language+learning&id=ED367142>.
- Creswell, J.W. 2007. *Qualitative Inquiry and Research Design: Choosing among Five Approaches*. 3rd Edition, Sage, Thousand Oaks.
- Dueñas, M. 2004. The Whats, Whys, Hows and Whos of Content- Based Instruction. *International Journal of English Studies*, 73-96. Retrieved from <http://files.eric.ed.gov/fulltext/EJ1072197.pdf>.
- Grossman, P. L. 1990. *The making of a teacher: Teacher knowledge and teacher education*. New York: Teachers College Press.
- Resnick, I. B. 1987. *Education and learning to think*, Washington, D.C., National Academy Press.
- Shulman, L. S. 1986. Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4-14.
- Schmidt, H. G., & Boshuizen, H. P. A. 1992. Encapsulation of biomedical knowledge. In D. A. Evans & V. L. Patel (Eds.), *Advanced models of cognition for medical training and practice* (pp. 265–282). New York: Springer.
- Simon, H. A., & Chase, W. G. 1973. Skill in chess. *American Scientist*, 61, 394–403.
- Miles, MB. & Huberman, AM. 1994. *Qualitative Data Analysis* (2nd edition). Thousand Oaks, CA: Sage Publications.

