Speech Modification by Science Teachers in Presenting Science Using English

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Abstract. *This case study was conducted to explore the speech modification by science teachers in presenting science in English. There were two subjects, science teachers at the third and fourth grade levels. The data were collected by recording the teachers' voice while they were teaching science in their class and interview protocols. The findings show that the teachers have done some points as theoretically claimed. In focus on key words, the teachers in all meeting did not introduce the new words more than twelve. Sometimes the teachers used words with personal reference in presenting the materials. Shorter and less complex sentences were also found in their teaching even though sometimes they also used complex or long sentences. Repeating or paraphrasing sentences did not show too much. The teachers asked intersperse questions almost in all the meeting to dig students' prior knowledge or sometimes just to review the previous lesson. Most of the feedbacks were shown when students mispronounced the words or they did not know how to spell the words. As a conclusion, when the science teachers made their language more comprehensible to their students by modifying how they talked in a number of ways, the learning process becomes effective.*

Key words*: speech, science, science teacher.*

Introduction

Nowadays, there are many schools in Surabaya. According to Bagian Sistem Informasi Biro Perencanaan dan KLN DEPDIKNAS – 2007 (http://www.sertifikasigurujatim.net//index.php?option=com_wrapper&Itemid=24), there are 1,093 elementary schools in Surabaya and 572 of them are private schools. These private schools compete to gain as many students as possible. One of the programs that they offer is using English as a medium of instruction.

English is the international language that is used worldwide, especially in this era of globalization. In his article, entitled "Benefits of Children Learning English as a Second Language", Abrahamson (http://www.eslteachersboard.com/cgi-bin/articles/index.pl?read=2313) mention the benefits of learning English. First, learning English can increase a child's linguistic abilities because bilingual children are better able to comprehend the complexities associated with a particular language's meaning and grammar. Second, children are able to function at

a more creative level, experience increased attention levels with the ability to block out distractions, exhibit superior reaction time, and prevent the decline of cognitive reasoning later in life. Last, bilingual children also develop enhanced social skills. Bremer (http://www.oberseebilingualschool.ch/en/index.cfm?treeID=65) also adds that "Balanced bilinguals, the brains of which have naturally developed the ability to create simultaneous connections among many different symbols, demonstrate superior cognitive skills to those of monolinguals".

Parents consider that bilingual education for their children give advantages of learning more than one language early in life. It becomes inclination for some parents to send their children to bilingual school, although they are still 2 or 3 years old. They might think that speaking two or more languages is a necessity. Therefore, bilingual schools should prepare qualified teachers.

According to Paul (2003, 137), teachers should know their role if they want to be effective teachers. First, a teacher should know his or her role, as a controller or facilitator. Some teachers see themselves as controllers. They are in control of what students learn and of students' behaviors. Teachers, who see themselves as facilitators, look at children as natural learners. They provide good learning environment for their students to succeed. Second, a teacher should give personal direction. There are five factors needed to be considered if the teacher wants to give personal sense of direction; a teacher must be well prepared, design activities, select appropriates targets, draw children in, and give a feeling of accomplishment. Third, a teacher should provide help. Providing help can be done by answering students' questions, helping the students express themselves in English, scaffolding, and hinting. Fourth, a teacher should give extra help to the students who cannot understand. There are many ways to do this, such as giving private help, setting extra work, getting parents to help or making use of computers. Fifth, a teacher should teach asking and answering questions. By teaching how to ask questions, students can ask anything that they are interested in. Last, a teacher should reduce dependency. As teachers, we expect our students can learn independently.

Teachers in Indonesia must have the educational certificate to teach a certain subject. For instance, science teachers must hold the educational certificate of science. They are not supposed to teach social studies or other subjects, except science. Then, it will come up some questions if science teachers have to teach science in English, such as how a science teacher presents science concepts using English if (s)he does not speak English, or an English teacher teaches science if (s)he does not have science education background, how the language is used by science teachers in presenting science in English, whether the school anticipates or is aware of this kind of situation, and how the school bridges this kind of situation.

The writer picked science as the study since science has many difficult words or terms, such as *photosynthesis, changing state, water cycle*, etc. Therefore, schools should prepare their teachers to use English for specific purposes (ESP)**.** According to Strevens' (1988) in Hutchinson and Waters (1991) ESP makes a distinction between four absolute characteristics and two variable characteristics. The absolute characteristics are that ESP consists of English Language Teaching which is (1) designed to meet specified needs of the learner; (2) related in content (that is in its themes and topics) to particular disciplines, occupations and activities; (3) centered on language appropriate to those activities in syntax, lexis, discourse, semantics and so on, and analysis of the discourse; (4) in contrast with 'General English.' And the variable characteristics are that ESP (i) may be restricted as to the learning skills to be learned (for example reading only); (ii) may not be taught according to any pre-ordained methodology. Dudley-Evans and St John (1998, 75) also adds that "where English is used as the medium of communication and students are expected to present written work and make oral presentations in accurate English, serious weaknesses in grammar require more specific help". Hence, bilingual schools should pay attention to both of the teachers and the goal that they want to achieve for their students.

Godwins Elementary school is one of bilingual schools in Surabaya. The highest level is grade four. The school is a national school that holds the national certificate from Dinas Pendidikan. The school uses two kinds of curriculum, national curriculum and Abeka homeschool curriculum which is adopted from the United States. The National curriculum uses KTSP (Kurikulum Tingkat Satuan Pendidikan) and the medium of instruction is bahasa Indonesia. National curriculum is for students who will not continue their study abroad. The school also facilitates those students who want to continue their study abroad. They can take the Abeka curriculum program. In the Abeka curriculum, the medium of instruction is English. According to the principal, the reasons for the school to choose the Abeka curriculum are as follows: (1) there is no school in Surabaya that uses the United States curriculum; (2) this curriculum is easy to be taught to the students and the steps in teaching the concept are explained in details and the teaching aids are provided; (3) the SAT (Standford Achievement Test) can be taken di Jakarta and Surabaya.

The writer observed the class that uses the Abeka curriculum since in that class science is taught in English. Science teachers have to master science knowledge to teach their students. As Carrasquillo and Rodriguez (2005) explain that "Science needs to be taught in a way that is understandable, is active, and includes a meaning-making process that has relevance for multicultural students while promoting increased English language proficiency."

The school gives rules for the teachers who teach science. The teachers should review the previous lesson before giving the new lesson.

They must give hands on experience and projects. There must be fieldtrip programs or outdoor activities. Also, teachers should give quizzes and tests.

Ms. L and Ms. V have the English education background but they do not have the science education background. The school wants them to teach science in English. Since science has its own terms that are different from general English terms, the teachers must know how science has to be taught and how to integrate it with the language. By integrating the language and science learning, students will not just gain the concepts of science but also increase their English language proficiency.

In line with the background above, the study tried to answer the question: How does the teacher modify the speech in presenting science in English?

Science teachers can help students understand the science concept while improving their English skills by using specific teaching strategies. Fathman, Quinn, & Kessler (1992) suggest that one of the strategies that can be used in presenting science in English is modifying the language. Teachers should pay attention to six important things in modifying the speech or language in teaching science in English. They are (1) focusing on key words; (2) using words with personal references; (3) using shorter and less complex sentences; (4) repeating or paraphrase whenever possible and pause frequently; (5) interspersing more questions with discourse; and (6) provide feedback on language through restatement, not overt correction.

Therefore, these following minor research questions were formulated:

a. How many new words did the science teachers introduce in each meeting?
b. Did the science teachers use words with personal references?
c. Did the science teachers use shorter and less complex sentences?
d. Did the science teachers rrepeat or paraphrase whenever possible; pause frequently?
e. Did the science teachers intersperse more questions within discourse?
f. Did the science teachers pprovide feedback on language through restatement, not overt correction?

Method

The Subjects

The writer had done the observation in three months, from February to April 2009. Since this was a case study aiming at exploring the speech modification, the subjects of this study were science teachers of Godwins Elementary School Surabaya. There were two teachers that had been observed: Ms. V and Ms. L.

Ms. V is a science teacher who taught at level 3 of the elementary school. Her education background is English education. After graduating from the university, she worked in a private national school that uses

Indonesian as the main medium of instruction. She resigned from that school and worked in an English course and taught general English for adult. Since 2008, she joined Godwins Elementary School. Even though her education background is English education, the school wants her to teach science in English.

Ms. L is a science teacher who taught in primary 4. Her education background is English. She has been joining at Godwins Elementary School since 2005. She is a senior teacher in that school.

After the principal of Godwins Elementary School introduced the writer to the teachers, the writer did not directly do the observation. At the first and second meeting, the writer stayed in their class. The writer had conversation with them and also their students. The writer usually came thirty minutes before doing the observation. The writer built the relationship to know the subjects. Sometimes, the writer also helped in handling the class if they had something to do for a while. The writer also helped the subjects if they needed some help. For instance, when Ms. V wanted to do the experiment and she did not have any cans for that experiment. The writer helped her by bringing cans in the next meeting. The topic of the conversation was about the jobs, families, personal dreams and expectation.

The Instruments

The key instruments of the study were the investigator herself and an interview. The investigator was non participant observation. The writer directly observed the teachers and students' activities in the classroom. The writer put the recorder in the subject's pocket and the microphone was nipped in the subject's collar. Then, the writer sat at the back of the class and took notes. The writer wrote things that happened during the lesson.

The interview was done after finishing all the observation. The questions were structured. The recorded teachers' voice and interview protocols were used to explore the speech modification in teaching science using English.

Data Collection

The data were science teachers' speech or oral in presenting science concept using English. The data collection began when the teachers presented the science materials. It was done from February to April 2009. The observation was once in a week. For carrying this study, the writer followed these procedures:

a) The observer did not just directly do the observation, but she also built a relationship first with the subjects. That was why at the first and second meeting, the observer just met and had conversation with the subjects. The observer also stayed inside the class to see while she was teaching and got to know the students.
b) The recording equipment consisted of only one omnidirectional microphone which was placed on the subject's collar. Since the

equipment is small, it did not disturb the subject to move around the class. The subject could also use their body language in explaining the concepts.

c) The observer sat at the back of the class making notes at salient points of the things that happened during the lessons (e.g. students' attitudes while the teacher was teaching) and noting the use of gestures by the teacher for such things as clarification and exemplification. In addition, I noted any visual materials employed by the teacher and displayed on such things as a whiteboard and overhead projector and collected copies of any handouts that were distributed as well as keeping a record of any text books that were used.
d) The tape recording was transcribed for analysis.
e) The observer also administered a retrospective interview to find other information which could not be detected from the recording.

Findings and Discussion

The purpose of this study was to explore the speech modification by science teachers in presenting the science concepts in English. When science teachers teach science in English, they should use teaching strategies for language and science. One of the strategies is modifying language (Fathman, Quinn and Kessler, 1992).

Teachers need to make their language more comprehensible to English language learners by modifying how they talk in a number of ways and also providing feedback to students. This chapter deals with how the teachers modified the language as pointed out by Fathman, Quinn and Kessler: (i) focus on key words, (ii) words with personal references, (iii) shorter and less complex sentences, (iv) repetition or paraphrase whenever possible; frequent pause, (v) more questions within discourse, and (vi) feedback on language through restatement, not overt correction. The writer also conducted an interview with the subjects to back up the discussion of the study.

Focus on Key Words

According to Fathman, Quinn, & Kessler (1991), "the introduction of new vocabulary should be limited to fewer than twelve words per lesson." The chart below shows the new words used by the science teachers at Godwins Elementary School in presenting science using English in each meeting.

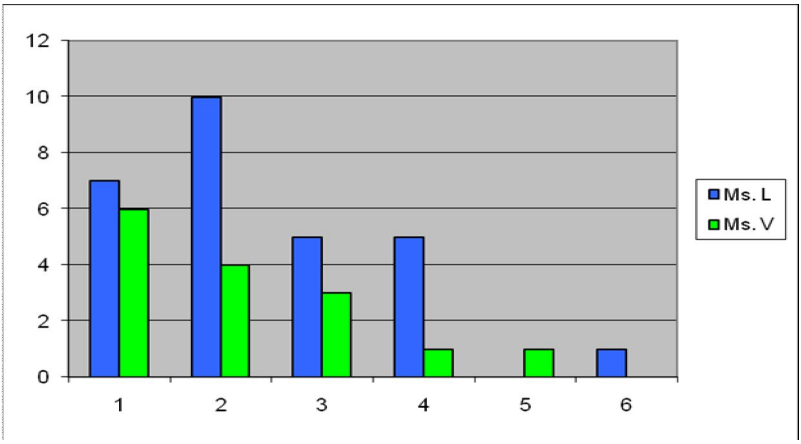

Figure 4.1. Key words.

It shows that Ms. L and Ms. V never introduced the new words for more than twelve words. Ms. L and Ms. V said that since they had been in Godwins school, they had never attended any training about how to teach science in English. But here, even though they do not know that they have to introduce the new words for not more than twelve words, they did it in their class.

At the first observation, Ms. L introduced seven new words on her lesson. She repeated the new words for several times. For example:

(1)As I told you that water in the air is a...the amount of water vapor in the air is called humidity. When this is a ...I am not talking about yes not evaporation, not yet. OK. The water vapor, you know that the air contain of water vapor, the amount of water vapor in the air is called also humidity, Ok, humidity. If we talk about how many amount of water in the air, we called it as humidity. If the air has high, if the air has high humidity, we call it there is a lot of water vapor in the air. The temperature of the air affects humidity. (p. 68)

She mentioned the word *humidity* for six times and five times for the word *water vapor*. In addition, she did not just repeat the word, but she also explained the meaning for several times. For example, the word *humidity*. She explained it until three times.

(2)The amount of water vapor in the air is called humidity…The water vapor, you know that the air contain of water vapor, the amount of water vapor in the air is called also humidity… If we talk about how many amount of water in the air, we called it as humidity. (p. 68)

Another example is the phrase of *relative humidity*.

(3)…water in the air we use the term relative humidity, relative humidity. If we called water, water in the air, we talk about relative humidity to describe the amount of water vapor…If we talk about 100% relative humidity; it means we are talking about the number of water vapor that the air can hold in that temperature. (p. 68)

At the second to the sixth observations, she never introduced the new words for more than twelve. In her lesson, the maximum new words that she introduced were ten words. At the time, she explained about kinds of cloud, then she introduced: *cirrocumulus*, *cirrostratus*, *altostratus*, *altocumulus*, *stratocumulus*, *nimbostratus*, *cumulonimbus*, *weather forecasting*, *meteologist*, and *air massage*. One example of new words that she explained is as follows:

(4)We called this kind of cloud that bring rain and storm as nimbo. So nimbostratus clouds are dark, gray sheet of rain clouds. Stratus are like of sheep or like white blanket but if it's very dark we called it this very low. It's going to rain, we can see the cloud is very clear, clearer than usual. So, that is, what is called nimbostratus. It's very low but it very dark. It means it's going to rain and we called kind of cloud as nimbostratus. (p.73)

She mentioned the word *nimbostratus* for three times. Actually the previous lesson, she has explained four main types of cloud. And this session, she explained kinds of cloud that can be combined it. For instance, nimbus and stratus can be combined become nimbostratus. Here, students got the prior knowledge before the lesson started. Another example was also shown when she explained about *stratocumulus*.

(5)Stratocumulus clouds are low layers, low puffy cumulus. That is, yes, stratocumulus is stratus and also cumulus. It's a bit lower and it's puffy, so we called low layers of puffy cumulus clouds. Usually the, this is the puffy one, this is the cumulus one, today the cumulus is a little bit lower, so we called it stratocumulus. So it's a combine.(p. 72-73)

She explained the meaning of the words until several times.

The writer also noticed that there were some new words that she needed longer time to explain it. The writer thought it was because the words were difficult terms for the students to understand. Ms. L explained the words while doing the experiment. This helped the students to grasp the concept easily. For example, she explained the phrase *surface tension* while doing the experiments.

(6)We are talking about water surface tension, ok…So the character of the water molecule is far more readily than other molecule of many other liquid, it called surface tension. So in the surface of water we have surface tension because water have such of high degree on surface tension object which are heavier than water which float on the surface, which float on the surface, unless the surface film of the water broken…Why I use that court to proof for you because when the surface tension or the water surface film, the water film is still not like bother or broken even here we just actually heavier than water, then we put a court it's a kind of load on it, it will stay on the surface until we break the film. So it what we call as surface tension. (p. 79)

It also happened when she explained the word *dissolving*.

(7) We will proof that water dissolving…I will fill one of the glass, I will mix it, we can proof that the level of water in both glass is the same, even though I add several cube, the water level will remain the same. Why? Because water dissolve other substance, ok?...The sugar will fill the empty space between the molecule of water, so that's why the water level will not change. Now from Audrey, only this glass. This is dissolving. Do you know dissolve? Dissolve means become one, become one with the water…If we compare to the cube of how many cube that we put in the water, it only add a little bit, ok, just a little bit, because it dissolve, not much. It dissolve. (p. 80)

At the fifth meeting, Ms. L did not introduce any new word. It was because she has explained the key words in her last meeting. However, she repeated the key concept for several times to help the students ensure comprehension.

(8) Why he saw the flash first and then not long after that, and then he saw the explosion? Because? Ya, we are talking about sound. So because sound travel slower than light. Because sound travel slower than light. Yes, not now. It depends, it depends. So you have to make it as a general. So sound travel slower than light. That's like one. If you got lost in the night in the forest, you see the flash light of your, of someone that looking for you first before you heard the sound. You heard, you heard that your name is called. OK. Because sound travel slower than light. (p. 90)

She repeated the sentence *sound travels slower than light* for four times. The teacher also used her body language when explaining and repeating this sentence, some students might be able to grasp the idea. Another example was shown below when she explained about *sound begins*.

(9) Do the molecule of air move from the place where the sound began all the way to your ear? The answer for that question is no. It's not moving. They don't move. They stay. The disturbance that moves. ... Do the molecule of air move from the place where the sound begin? OK. Show the rock. If the molecule of the air move, it means the water is not there anymore. It's move but the water is still there. So the molecule of air is not there. It's just vibrate. That is disturbance that move ... OK. But it will be back. Oracle, disturbance that is the one that moves ... This create disturbance, this create disturbance and disturbance move but not the molecule of air. This create disturbance and disturbance move but not the molecule of air. (p. 92)

At the first observation in Ms. V's class, she talked about *volcanoes*. Ms. V introduced six new words on her lesson: *volcano*, *erupt*, *sediment*, *oceangraphy*, *repose*, and *community*. In explaining the new words, she did not show any pictures or objects. She drew on the whiteboard and explained the words for many times. She also used her hands or body language to explain the words. For example, the word *erupt*.

(10) There are even volcanoes in the sea. Occasionally a volcano will erupt and an island will be formed. So this is the history.. sometimes we can also say this is a process when suddenly there is small island..a…a….after, big… such a big disaster. Example.. will be split like that… the.. the.. the exactly what happen we don't know, but here.. it says.. occasionally a volcano will erupt and an island will be formed. Yes.. continue.. Eli please. Erupt means explode like that. Yes, explode.. like that and can split… and can mess up Everything in the ocean that make… and by time by the process slowly but sure it will be… it will form an island. (p. 96)

Another example is the word of *sediment*. She repeated the sentences that explain about *sediment* twice.

(11) Nah, you know chalk actually Where is it form? From sediment. Scientist study the sediment about the animal which use live in the sea and on the earth. Study sediment sometimes help us find oil. Study sediment sometimes help us find oil .When sediment harden and it become very hard, it make from chalk. (p. 96)

At the second to the fifth meetings, Ms. V never introduced the new words for more than twelve. She rarely brought any pictures or objects to show the words, but she explained it orally by giving examples. Below are some examples of the new words.

(12) What is the unique thing from beacon? Almost invisible, because this is we call it camouflage. What is that? Do you remember? So if I say, yes, iguana, chameleon…Some animals God give a special and unique ability, what is it? To change itself by the same color with their surrounding. Invisible, cannot be seen clearly. Not gone actually, but you don't see it well, it's not really clear at all. Camouflage. Then, what else that you can mean some animals with this kind of ability? Iguana, chameleon, octopus. And may be we still have many more but we still do not know yet. Not all bird nest are in trees. This is also, hello, this is also the second unique thing. Why you only give me one? Camouflage only. (p. 105)

(13) How does the frog egg like? Is like? Why is it call jelly like? If jelly like, it means it's like jelly. How does jelly like? Elastic. Kenyal is bahasa. What is the English of kenyal? Elastic, flexible, elastic or flexible. And then what else? Have you ever eaten jelly? Elastic, flexible, and then what else? Is it hard? Is it soft? Soft and tender. And then one more thing, jelly, jelly, do you know jelly? Jelly is something that you eat, it is fresh and then does it content of milk? If it is content of milk, what is it mean? Pudding. So if jelly, you haven't given me the description of the frog egg like, it is called jelly like. Why is it call jelly like? Because it is like jelly. (p. 107)

(14) If you can see through, yes, what is the English? It starts with T, transparent. So that's why the frog egg, the scientist describe it for us, if we have never known before, how do the frog egg like ya? Oh because it is transparent, it is smooth, it is not hard…Because it is

smooth, it is not hot at all, that's why they call it, it's like jelly like, transparent...Why the frog egg called jelly like? Because it is transparent. It is transparent and it is not hard anymore. (p. 107)

(15) The wind is actually moving air. The wind is actually moving air...The sun warm the air and mix it becomes lighter. Because the warm air is lighter than cold air...You know the warm air is lighter than cold air. Look at here 152. The wind is moving air. The sun warm the air, the sun warm the air and mix it become lighter. Because warm air is lighter than cold air, because warm air is lighter than cold air, it raises. (p. 110)

From the above transcribes, Ms. V explained the new words or concepts for several times. Sometimes, she did translation, from English to Indonesian. The writer thought, it happened because she saw that students were having difficulty to grasp the concept or the meaning of the word.

The writer noticed that the teachers focused in key words because they thought that the students didn't have the concept yet. That is why they explained the word for several times and they also used many ways in explaining the new words such as used pictures from books, did experiments, drew on the whiteboard, used their body language and spoke slowly, etc. For instance, when Ms. L introduced the word of *surface tension*. She asked the students to do experiment together. Students gathered in a circle of table that she had prepared before the class started. She did the experiment first to show to the students what the meaning of *surface tension* is. While doing that, she kept talking to explain the word. She did it twice and students payed attention to of what she did. She also did not allow the students to talk while she did the experiment. After that, she asked them to try by themselves in turn. The writer noticed that the purpose of doing the experiment in explaining the word was to make the students understand the concept well. Science is a way of thinking that involves doing and acting (Carrasquillo and Rodriguez, 2005). Here, students did and acted by doing the experiment.

Another example is when Ms. V explained about the *frog egg likes*. During her lesson, she asked one of the students to read the textbook. The other students payed attention to the textbook. After one paragraph, she asked to stop and explained the concept in that paragraph. When explaining the frog egg likes, she explained by giving an example. She used the word *jelly* to describe the frog's eggs. The word *jelly* is familiar for the students. It was shown when she asked a question about *jelly*, such as *do you know jelly? Have you touched and eaten before?* Here, students gave a response actively to her question. The writer saw that when explaining the concept, the teacher tried to make their students understand well the meaning of the word.

The writer noticed that even though the teachers did not show many real objects or pictures, they visualized it by drawing or sometimes they just explained orally and gave examples. The way they were explaining the words showed that students could grasp the concept well.

The first reason because they used examples in explaining the word. Second, they did the experiment and involved the students to do it. Also, they used body language and spoke slowly to the students. As suggest by Fathman, Quinn, & Kessler (1991), vocabulary can best be introduced by using real object, picture and visual.

Repeating the words and sentences were also shown in their lesson. By repeating, students might be able to grasp the meaning well. Probably, the science teachers did not know that repetition is suggested by Fathman, Quinn, & Kessler (1991). The writer thought that they did it well in their class.

Words with Personal References

According to Fathman, Quinn, & Kessler (1991), "The meaning of scientific terms can be clarified and personalized through careful choice of vocabulary." The personal reference that focuses on student will help the students to grasp the concept faster.

In Ms. L class, the writer noticed that sometimes she used personal reference in explaining the lesson. Here are some examples of personal reference that she used it.

(16) The higher you go the higher the temperature is, the lower actually, but the lower your place is the higher the temperature is…If you see morning dew, it's not gas but tiny water droplets, but you can see…So in the morning, when you wake up and you see the morning dew, that is the process of condensation. And you can see that gas at water vapor you can see but once it turns into morning dew, and you can see it, that the tiny water droplets. So if you see outside once it's getting dark, you know that the water vapor it become larger and larger and soon the cloud cannot hold the water droplets anymore and soon it will rain. When it rain you know that the precipitation happen. Ok. When the liquid come to earth, we know you realize that precipitation is happen in the cloud, precipitation. (p. 70)

(17) So meteorologist is scientist…You have to be able to know the temperature and also the air pressure and humidity…It's hot you can feel it's cold, you know the temperature…This air pressure but you can see air pressure if you are assimilate in the air or underwater…If you go to Trawas, you can feel the air pressure…When you're sweaty a lot so humid. You can feel it's hot and humid…Can you imagine if there is no the warning system of the hurricane? How many lives will lost? (p. 74)

The personal reference *you* focuses on students and is familiar everyday vocabulary and concept. The teacher wanted to relate her lesson with the students' life. Students might have understood understand the idea because the teacher talked something that relate with them, the things that they could do or influence them.

Here are some other examples shown in other meetings.

(18) We make the sound, your friend hear your voice that time the molecule of the air is moving, then that molecule of the air moving toward the person. When I am talking, the air around me is moving, the molecule in the air around me is moving and move to, and the sound move to your ear. (p. 85)

(19) For example, if you are in the forest, you get lost in the forest, your mom or your dad is looking for you using the flashlight, the first thing that you can hear is even though your daddy say Dave, Dave, Dave, where are you Dave? But the first thing may be you cannot hear the sound, but you can see the light first. (p. 86)

(20) I want you to touch your throat, here and you make sound like this, m, a, i, it's okay any sound, touch it, here, your neck. Do you feel there are something that vibrate? OK, now, stop while you are touching this? Any vibrate? (P. 87)

(21) If from your lung passes over the vocal cord and causes them to vibrate. (p. 88)

(22) When you sing, you can sing as long as there are air in your lung, but once you cannot sing it means no more air in your lung. Ok. You cannot make any sound. (p. 88)

(23) So the vibration produce the sound of your voice, the vibration of the object and the molecule of the air. (p. 88)

(24) If you got lost in the night in the forest, you see the flash light of your, of someone that looking for you first before you heard the sound. You heard, you heard that your name is called. OK. Because sound travel slower than light. When you are waiting your daddy coming home, you didn't hear the sound of his car yet, but you can see the light first...the head light. Ya, after that you will see the light first. (p. 90)

She did not just use the word *you* as a personal reference but also *your friend*, *your voice*, *your ear*, *your mom*, *your dad*, *your daddy*, *your throat*, *your lung*, *your voice*, and *your name* which focus on the students and familiar everyday vocabulary and concepts.

In another meeting, she used three personal reference in once, such as *you*, *your oracle* and *your body* as shown below.

(25) Can you touch the oracle? What you can touch here is your oracle... Yana, can you see the auditory canal? You can see the oracle or the auditory canal? The stirrup is the smallest bone inside your body, it's only half side of green orange. It's only a half side, it's a bone. It's very small. It's a small bone in your body. (p. 94)

The writer also noticed that in one of the meetings, Ms. L did not use personal reference in explaining the lesson. For instance, when she explained about *surface tension s*he did the experiment when explaining the word. The writer thought she did not use a personal reference because the new words could be explained well by doing the experiments. The

students would also not have any difficulty because they did and involved in doing the experiments.

In Ms. V class, the writer found the use of personal reference in presenting the materials.

(26) In the night condition it can very..unless you put some wood you want to make fire to warm your body. It's ok, but it can burn all. (p. 112-113)

The personal reference *you* and *your body* are familiar everyday vocabulary and concepts.

In some of her lessons, Ms. V did not use personal reference in explaining the lesson. The writer thought this was because the new words could be explained well by giving examples.

In one of the meetings, Ms. V asked questions using personal reference *you* but it did not directly refer to the concept of science. The examples are shown here:

(27) What game you can play in the pond? Camp? Can you build a camp? Ok, play cooking? And you will catch and you will catch eel. (p. 102)

(28) You know creek? Creek is also small river, yeah, you can just swim there. You can, you can take bath and play some water there. (p. 102)

The above examples show that Ms. L used more personal reference that Ms. V. As mentioned above that personal references are used to make students easier to understand the concept given because it involves students' life and environment. But if the writer refers to the topic, it is not just as easy as to use the personal reference in every topic. For instance, Ms. L talked five topics: *water cycle*, *types of cloud*, *weather forecasting*, *water surface tension*, and *sound energy*. From five topics, she used personal reference in three topics: *water cycle*, *weather forecasting*, and *sound energy*. This was because these topics could be related with students' personal life.

When Ms. V talked about *volcano*, *pond* and *amphibian of the pond*, she did not use personal reference in those lessons. If the writer refers to the topic, actually it is quite difficult to relate what she was talking about with students' personal life.

As point out by by Fathman, Quinn, & Kessler (1991) that teachers can modify how they talk by using words with personal references to clarify and personalize scientific terms through careful choice of vocabulary. The writer agrees with this opinion but it is also important to see and pay attention to the topic. The reason why it is necessary to see the topic is that not all topics can be personalized with students' life. Another reason is that the choice of vocabulary must be simpler and familiar with students' everyday vocabulary. For instance, if the teachers feel that the topic can be personalized with students' life, they can use simple words that are understandable or daily used.

Shorter and Less Complex Sentences

According to Fathman, Quinn, & Kessler (1991), "Scientific language often contains complex sentences in the passive voice. These types of structures can be shortened and expressed in the active voice." According to Carrasquillo and Rodriguez (in Richard-Amato and Snow, 2005:437) science has specific vocabulary, phrases, and terminology; therefore, the use of short sentence will help the students to grasp the concept.

The writer noticed that Ms. L used complex sentences in explaining the concept of science. The complex sentences here are long sentences. Here are some examples:

(29) The water vapor, you know that the air contain of water vapor, the amount of water vapor in the air is called also humidity. If we talk about how many amount of water in the air, we called it as humidity. If the air has high, if the air has high humidity, we call it there is a lot of water vapor in the air. The more the warmer the temperature is the more water vapor to hold in the air, OK. Warm air can hold more water vapor, remember that, warm air can hold more water vapor. Warm air more water vapor. (p. 68)

(30) The pilot when they are piloting the airplane, they will inform send information to the weather station what's going on around them while they are flying or also the ship will report regularly storm, maybe, there are storm, thunder, lightning…And this all information gathered, send to the weather information observation station, and they put all the meteorologist and they gather all the information, put all the information together in from computer they will read and forecast and send the weather forecast. (p. 75)

(31) So in the surface of water we have surface tension because water have such of high degree on surface tension object which are heavier than water which float on the surface, which float on the surface, unless the surface film of the water broken. (p. 79)

(32) Inside the liquid of water there are some molecules of water but if the molecule of water is like ball inside, there are room between molecule, there are room between molecule, just imagine the molecule of water, they are ball, no there is no ball, and because it's not solid so there are some room between molecule. (p. 80)

(33) So at the point where the sound is made, sound energy compresses or pushes together, and the molecule bump again each other when there is no vibrate, when there is no vibrate any more, you do not plug the rubber band, the molecule back to it's original position, ok. (p. 85)

(34) When I am talking, the air around me is moving, the molecule in the air around me is moving and move to, and the sound move to your ear. (p. 85)

(35) No air means no molecule in the air that can travel the sound of the alarm out of this glass jar to his ear because there is no air. (p. 86)

(36) This is because, because in our throat there is a passage way for air, ada ruang, there is a passage way of air and this is a box like chamber called the luring. (p. 87)

Ms. V did not use many complex sentences as Ms. L did. In her lesson, it showed only some sentences. She used almost shorter sentences in presenting her lesson.

(37) The sound wave touch your oracle and it travel through the auditory tunnel and the sound wave vibrate the ear drum, stirrup will vibrate the membrane and stimulate and send the message to your hearing nerve. (p. 95)

The writer noticed that she liked to use short sentences. The sentences could be understood by the students because she used simple sentences. Sometimes she used simple words or phrases. Here are some examples.

(38) Why the frog egg called jelly like? Because it is transparent. It is transparent and it is not hard anymore…It is the jelly like, it's just like the cover. So imagine that this is the cover, just like parachute, do you parachute? Do you know jelly fish by the way? It's like parachute, right? It can shut up, like this, open and shut like that. So this is the coating. So what is the coating, the function? To protect the egg. Because there is egg inside. To protect. Because of the jelly like coating this one, it enable the egg float, it enable the egg float. (p. 108)

The writer noticed that the ways the science teachers presented the materials are different. In Ms. L class, the writer noticed that sometimes she used complex or long sentences. But Ms. V liked to use short sentences. Fathman, Quinn, & Kessler (1991) suggest to shortening and expressing the sentence in the active voice. The use of shorter and less complex sentences will help the students to grasp the concept well.

Long or complex sentences can be shortened or simplified into simple or short sentences. Here are some suggestions in shortening or simplifying the utterances.

The statement

If the air has high, if the air has high humidity, we call it there is a lot of water vapor in the air.

could be simplified to:

High humidity means much water vapor in the air.

The statement

The pilot when they are piloting the airplane, they will inform send information to the weather station what's going on around them while they are flying.

could be simplified to:

The pilot will inform to the weather station about the situation in the air.

The statement

And these all information gathered, send to the weather information observation station, and they put all the meteorologist and they gather all the information, put all the information together in from computer they will read and forecast and send the weather forecast.

could be simplified to:

All information received by weather information station will be used by meteorologist to forecast the weather.

The statement

Inside the liquid of water there are some molecules of water but if the molecule of water is like ball inside, there are room between molecule, there are room between molecule, just imagine the molecule of water, they are ball, no there is no ball, and because it's not solid so there are some room between molecule.

could be simplified to:

There are rooms between molecules in the liquid of water.

The statement

So at the point where the sound is made, sound energy compresses or pushes together, and the molecule bump again each other when there is no vibrate, when there is no vibrate any more, you do not plug the rubber band, the molecule back to it's original position, ok.

could be simplified to:

The sound is made because there is vibration. The vibration happens because the molecules bump each other.

The statement

When I am talking, the air around me is moving, the molecule in the air around me is moving and move to, and the sound move to your ear.

could be simplified to:

When I am talking, the air around me is moving to your ear.

The statement

No air means no molecule in the air that can travel the sound of the alarm out of this glass jar to his ear because there is no air.

could be simplified to:

Since there is no air in the jar, the molecule will not travel the alarm sound to his ear.

The statement

This is because, because in our throat there is a passage way for air, ada ruang, there is a passage way of air and this is a box like chamber called the luring.

could be simplified to:

Luring is a box like a chamber in our throat for the air to pass.

The writer concludes that the teachers do not know that it is important to use short sentences in presenting science in English. Ms. V used short sentences in presenting the materials because she thought that

the materials given were difficult. That is why she used short sentences in order to make her lesson comprehensible to her students. In addition, she interspersed questions during her lesson.

On the other hand, Ms. L sometimes used long or complex sentences. She might think that her students are fourth grader. She expected that her students had better understanding compared than third grade. However in her lesson, she tried to make her students understand well by doing experiments, interspersing questions and also repeating the words or sentences.

Repetition or Paraphrase Whenever Possible; Frequent Pause

According to Fathman, Quinn, & Kessler (1991), "A concept, once presented, should be reintroduced in a number of ways and in various situations." Sometimes students are having difficulty to understand or to grasp the concept fast. Therefore, it would be better if teachers can repeat the sentence. Teachers can also paraphrase the idea in different ways using extended pauses between ideas.

The writer noticed that both Ms. L and Ms. V had done repetition in explaining the science concepts in their lesson. They might think that it is important for the students to understand better. The repetition did not only happen to the new word but also to sentences or phrases. As pointed out by Fathman, Quinn, & Kessler (1991) that repeated exposure reinforces key concepts and helps ensure comprehension.

In Ms. L's class, sometimes she did not just do the repetition twice but it could be more than that. For example, the concept of *humidity* was explained it until three times.

(39) The amount of water vapor in the air is called humidity…The water vapor, you know that the air contain of water vapor, the amount of water vapor in the air is called also humidity… If we talk about how many amount of water in the air, we called it as humidity. (p. 68)

Another example is also shown here:

(40) …water in the air we use the term relative humidity, relative humidity. If we called water, water in the air, we talk about relative humidity to describe the amount of water vapor…If we talk about 100% relative humidity, it means we are talking about the number of water vapor that the air can hold in that temperature. (p. 68)

Ms. L repeated the phrase *relative humidity* for four times. Some words repeated for three times, some for four times, some can be repeated for different time. The writer noticed that this depends on the difficulty of the key concept. She explained and repeated more the difficult terms or key concepts than the easy one.

The students might have been able to grasp the meaning because Ms. L did not just visualize and use her body language, but she also spoke slowly in explaining the words. Here are some examples of key concepts that she explained for several times, such as the key concepts of *nimbostratus*, *stratocumulus*, *sound travels* and *disturbance*.

(41) We called this kind of cloud that bring rain and storm as nimbo. So nimbostratus clouds are dark, gray sheet of rain clouds. Stratus are like of sheep or like white blanket but if it's very dark we called it this very low. It's going to rain, we can see the cloud is very clear, clearer than usual. So, that is, what is called nimbostratus. It's very low but it very dark. It means it's going to rain and we called kind of cloud as nimbostratus. (p. 73)

(42) Stratocumulus clouds are low layers, low puffy cumulus. That is, yes, stratocumulus is stratus and also cumulus. It's a bit lower and it's puffy, so we called low layers of puffy cumulus clouds. Usually the, this is the puffy one, this is the cumulus one, today the cumulus is a little bit lower, so we called it stratocumulus. So it's a combine. (p. 72)

(43) Why he saw the flash first and then not long after that, and then he saw the explosion? Because? Ya, we are talking about sound. So because sound travel slower than light. Because sound travel slower than light. Yes, not now. It depends, it depends. So you have to make it as a general. So sound travel slower than light. That's like one. If you got lost in the night in the forest, you see the flash light of your, of someone that looking for you first before you heard the sound. You heard, you heard that your name is called. OK. Because sound travel slower than light. (p. 90)

(44) Do the molecule of air move from the place where the sound began all the way to your ear? The answer for that question is no. It's not moving. They don't move. They stay. The disturbance that moves. ... Do the molecule of air move from the place where the sound begin? OK. Show the rock. If the molecule of the air move, it means the water is not there anymore. It's move but the water is still there. So the molecule of air is not there. It's just vibrate. That is disturbance that move ... OK. But it will be back. Oracle, disturbance that is the one that moves ... This create disturbance, this create disturbance and disturbance move but not the molecule of air. This create disturbance and disturbance move but not the molecule of air. (p. 92)

To explain how *sound produce*, Ms. L did some activities that involved the students. It helped the students to grasp the concept.

(45) So my intention to invite you in front of the classroom I want both of you to sing...I want you to make the sound of bird, ok but different bird…So the sound is produce when an object vibrates. Vibrate is moving back and forth, it moves rapidly. If it is like this is, we cannot say it vibrate, but if it is like this, it vibrate. Ok. When an object is vibrate it make sound…When you do, when you pull the rubber, the rubber, look at this, because this rubber is vibrate, right? Move back and forth rapidly, so you can hear the sound. It vibrate, when you pull it, does it make sound? Pull and hold, does it make sound? You have to make vibrate like this, does it make sound? (p. 83)

In addition to repeating the words, the writer also found that Ms. L repeated the sentence. For instance, when she explained about *sound wave*.

(46) When I am talking, the air around me is moving, the molecule in the air around me is moving and move to, and the sound move to your ear. But they found wave that we call sound wave. This is sound wave. This is sound wave. This is the object that vibrate, object vibrate or sound, make sound, ok. And this is the sound wave. So when there are ear. (p. 85)

In Ms. V's class, she also did repetation for words or key concepts that are important for the students to understand or get the meaning. She did not bring any pictures or objects to show the words but she explained it orally by giving examples. For example, she explained the word of *camouflage*. She mentioned the word for three times and she gave example that was easy to understood by the students.

(47) What is the unique thing from beacon? Almost invisible, because this is we call it camouflage. What is that? Do you remember? So if I say, yes, iguana, chameleon…Some animals God give a special and unique ability, what is it? To change itself by the same color with their surrounding. Invisible, cannot be seen clearly. Not gone actually, but you don't see it well, it's not really clear at all. Camouflage. Then, what else that you can mean some animals with this kind of ability? Iguana, chameleon, octopus. And may be we still have many more but we still do not know yet. Not all bird nest are in trees. This is also, hello, this is also the second unique thing. Why you only give me one? Camouflage only. (p. 105)

She mentioned some animals which are camouflage. She also explained the word *camouflage* with different words but they have the same meaning.

(48) To change itself by the same color with their surrounding. Invisible, cannot be seen clearly. Not gone actually, but you don't see it well, it's not really clear at all. (p. 105)

In one of the meetings, Ms. V only introduced one key concept: *wind*. The students might have understood the word of *wind* but the teacher wanted to emphasize the real meaning of that word.

(49) The wind is actually moving air. The wind is actually moving air...The sun warm the air and mix it becomes lighter. Because the warm air is lighter than cold air...You know the warm air is lighter than cold air. Look at here 152. The wind is moving air. The sun warm the air, the sun warm the air and mix it become lighter. Because warm air is lighter than cold air, because warm air is lighter than cold air, it raises. (p. 110)

She repeated the meaning of *wind* for three times. She also repeated another sentence that supports the meaning. She also mentioned *the warm air is lighter than cold air* for six times. By doing this repetation, she expected that the students were able to grasp the concept well.

Ms. V also did repetition that she might have thought the word is new for her students. It showed when she explained about *jelly* and *transparent* in her third meeting. For the word *jelly* she explained for thirteen times and the word *transparent* for five times. The writer thought that she explained the word *jelly* until thirteen times because she was afraid that the students could not differentiate between *jelly* that is food and *frogs' eggs* that is like jelly. And for the word *transparent* that was explained for five times, the writer thought that this might be because the students have known the word before. So, she just high lighted the word.

To know the words that are difficult or not, the writer thought that it depends on the teacher. She is the one who knows the students' ability in comprehending the words or sentences. Also, it can depend on the material, whether the materials had been explained before or not. The more difficult of the words, the teacher should explain for many times. Here, the role of the teacher is very important in understanding their students' ability.

The writer concludes that repeated the words, phrase or sentences is very important to make the students understand the meaning. Teachers can repeat the words as many as they need to repeat based on their students ability in comprehending the words. Teachers can mention the word as many as it is necessary to make the students understand.

More Questions within Discourse

According to Fathman, Quinn, & Kessler (1991), "Teachers can ask questions to help students understand, to encourage critical thinking, or to find out what students know about a science concept." Shaffer (2007) points out that prior knowledge will affect for better or worse how new information is integrated with older concept. Having the prior knowledge influences learning (AAAS, in Shaffer, 2007), therefore teachers can intersperse questions within their lesson.

Ms. L started her lesson by directly re-explaining what she had explained in the previous lesson. In the middle of explaining, she asked the students about what they knew about science concepts. For example, in her lesson there was a relationship between *water cycle* and *gravity*, she has taught about *gravity* before, here is the question that she gave to her students:

(50) What is gravity? The force of earth that pushing down to the center of earth. But out of the atmosphere no gravity so the satellite can just float on the outer space. (p. 69)

This shows that she also interspersed questions during her lesson. Other examples are shown below:

(51) Do you understand about the humidity? The humidity is the amount of water vapor in the air. The warmer the air is more water vapor the air can hold. Now, how does water vapor get into the air? This is the water vapor, how can it goes to the air? Like this because of this evaporation. What is evaporation happen? How? Why the water

vapor become water or why the gas become liquid? what is the freezing point? (p. 69)

(52) What stratus clouds are? What is humidity?...The number of, not number. Humidity is water vapor where… Where is the water vapor? Yana, what is humidity? (p. 74)

Interpersing questions during the lesson were shown to recall the previous meetings.

(53) What is vibrate? ... The number of sound wave, so the vibrating object produce sound. Ok, now you know that not every frequency that our ear can hear, is it too high or low, we cannot hear it... So what do you think, mammal or not? Do you know what is mammal? How they have the younger one? From egg or baby? If they deliver baby, young lion, they are mammal. (p. 93)

When Ms. L was doing the experiment with her students, she also asked questions to raise students' understanding of the science concepts. Before doing the experiment, in the previous lesson, she has taught the theory and to get deep understanding, she did this experiment.

(54) I give heat to this water, so it means what happen if we heat a liquid, what happen with the molecule inside? They move, Dave this is for you, what happen with the molecule inside the water if we heat it? Wrong. What happen? Melissa, if we heat the liquid, if we heat the water, what happen with the molecule in inside the liquid? No. We learned for many times. If we heat the substance, what happen with the molecule? What happen? What more? (p. 81)

The above question shows that she has taught the lesson but it seemed that the students still did not understand the lesson before. She gave some minutes to the students to think of the answer. She expected also by doing the experiment the students understood the concept well.

Ms. L did not just give questions to review the previous materials, but she also interspersed questions during her lesson to dig students' prior knowledge.

(55) How about weather forecasting? How to know how to forecast weather? What is air massage? (p. 73)

(56) What cause, what happen to the air around the object when we plug or move the object? What happen the molecule in the air? Vibrate is like this. What happen to the molecule in the air? (p. 84)

In Ms. V's class, she also liked to give questions during her lesson. In one meeting, she asked the students to open the text book and chose one of them to read the text. After some sentences, she asked the student to stop and she explained what the text meant. She did not just explain directly but she asked questions to find out students understanding about the text that they just read. For example, when the text mentions about volcano, she asked the students about a volcano, not just directly explained.

(57) There are even volcanoes in the sea. Can you imagine? Do you know volcano? Volcano is, what kind of mountain? Active

mountain? How is it doing? How is it doing? Why we say volcano is an active mountain? It can produce lava. Yes.. and also you know volcano, we can say that it is an active mountain. Why? (p. 95)

This shows that she wanted to dig students prior knowledge about what they knew. Here are some other examples:

(58) How can an island be formed? Why suddenly there is island?...What is mineral?...But in the deep down the ocean yes, but what kind of plant? Plankton, but near or around the beach, of course you can't find many plants. Why? Now can you tell me what do you know about pond? (p. 99)

(59) Where? Why? Why there so many mosquitoes there?...And then what makes, what makes the pond, what makes the pond become alive? No, no. What make the situation in the pond sometimes can be alive?...Why is the water in the pond is not salty? Why isn't that salty?...How do the plants, how do the plants near the pond live?...What is community?...Who can tell me the process, how do fishes, how do fish breathe, how do they get oxygen in the water? Who can tell me? Who can explain to me. (p. 101)

(60) Why is it call jelly like? If jelly like, it means it's like jelly. How does jelly like?...When do the best time for frogs to lay egg?...So this is the metamorphosis of what? Frog. The process of changing. So from the young, the baby, the egg until become adult, toad. And when they were so young, how did they do for breathing?...What mammal can live in the pond? Muskrat. Reptile in the pond. Please read Elly. Hibernation. You know hibernation mean?...Why the turtle are very useful in life the round the pond, why? (p. 107)

(61) In the forest who can tell me how God make animals survive? No, no that one, not the answer that I want. Once again, this is not the answer that I want. There are many kinds of animal in the forest, in jungle, right? Yes…Once again, this is not the answer that I want. How one kind of animal or plants or there are so many kinds of animal, my question, how do they survive? Food chain. Yes. But you don't explain it. You have to explain it. What do you mean by food chain here? You cannot say directly, if my question how do animals survive in the forest? And you say directly, you give me short answer by food chain. People will not understand. Food chain? What is food chain? It means that you have to explain. Whitney, you talk too much. If the example of the question is this, how do you go to godwinds school? And then you give me directly short answer, by car, people will understand directly. But if there is question, how do the animal in the forest? How do they survive? (p. 112)

From the above examples, she interspersed questions during her lesson even though those were new concepts for her students. She kept giving questions in order to find out students' prior knowledge.

Interspersing questions can also be given to recall or review the previous meeting or materials. Before giving the new lesson, it is important to know whether the students understand the previous concept or not. Here are some examples when Ms. V gave questions to know her students' understanding of the previous concept that she taught before.

(62) What did we talk last before? Yes, I know pond. Who can tell me, who can tell me, how, who can, who can tell me, why, why is the life, yes, who can tell me, why is the life in the, in a pond, around the pond is so dull and boring? (p. 100)

Sometimes, her questions were just to make sure whether the students have already understood her explanation or not. For example, she explained about the *frogs' eggs*.

(63) So how does frog egg like? No, I don't need to draw. How does the frog egg like? Is like? (p. 107)

Ms. V also did not give up easily when the students did not answer the question correctly. She gave some information and guided them to answer again.

(64) You know population mean? The number of the people, God make the death happen, what will be happen? ... So they have what, how do they cook their food? ... How old is the tree? Who can tell me? How old is the tree? ... Paper, tissue, book, what will happen? We need more what? What is the connection? Because paper are made off wood. How you can get wood? Tree. The tree that we plant and grow until hundred years balance or not? A small seed and grow become bigger and wider and taller, the same with When we cut become paper balance or no? What happen with our nature, or world our earth? (p. 112)

Every teacher has his or her own technique in presenting the material. Some teachers may start the lesson by giving questions to refresh the previous lesson, but some may have different ways. Ms. L started her lesson by directly re-explaining what she explained in the previous lesson. Ms. V reviewed her previous lesson by asking question in the beginning of the lesson. But in the middle of giving explanation, they did not forget to intersperse question. The main point by doing this is to help students to understand, to encourage critical thinking or to find out what students know about a science concept (Fathman, Quinn, & Kessler, 1991). Also, questioning during and after science activities can begin with factual recall and be expanded to explanations of causes or principles involved.

Some questions given by Ms. L and Ms. V were about new concepts. They did it because they wanted to find out their students' prior knowledge. They gave time and the opportunity to their students to answer the questions.

The writer concludes that the science teachers knew that by giving questions during their lesson will help the students to understand more about the concepts. The questions can be given in the beginning, middle

or end of the lesson. The purposes of giving question in the beginning of the lessons are to review the previous lesson and to dig students' knowledge about the new lesson that will be presented. The purpose of giving question in the middle of presenting the lesson is to dig students' knowledge of the new lesson that will be presented. And the purpose of giving questions at the end of the lesson is to review students' understanding of the lesson that has been presented.

The writer thought that intersperse questions by the teachers is very important as mentioned by Fathman, Quinn, & Kessler (1991). Ms. L and Ms. V did it well in their class.

Feedback on Language through Restatement, not Overt Correction

According to Fathman, Quinn, & Kessler (1991), "Errors are a natural occurrence in the second language acquisition process, and the best way for teachers to encourage students to express themselves is to model correct forms through restatement." They also point out that teachers should focus on the information given by the students, not on the correctness of their pronunciation or grammar.

The writer found that the science teachers restated their lesson rarely. One example is found in Ms. V's class. She did restatement when students said the sentence wrongly. For instance, one of the students asked about mineral, she said *what are minerals?* Then she restated the sentence correctly.

(65) What is mineral? Alexis, yes? Yeah… a mineral is.. not are.. you cannot count. You cannot count. (p. 97)

Here, Ms. V did not just restate the sentence correctly but she also explained why they havd to use *is* instead of *are* when they were asking about mineral. By giving explanation of student's mistake would help students to understand more and not to make the same mistake in the future.

Another example was also shown when she asked question *"What is the study of ocean?"* The students answered *oceanographer* instead of *oceanography*. Ms. V was did not just correct the answer but she also explained the difference between *oceanographer* and *oceanography*.

In Ms. L's class, many feedbacks were given by correcting mispronunciation.

(66) And the scientist who study this is called meteorologist. Me..te..or.o.lo…gist. So meteorologist is scientist. (p. 74)

She also pronounced the word very slowly. Another example from her class is as follows:

(67) Number 8? Stirrup not stir up. Stirrup...Oracle not Oricle. Oracle... Look at the picture. Look at the trunk. Cambium. (p. 90)

Another thing that she did in her class was asking the students to repeat the words that are difficult to pronounce.

(68) Remember these three turn. Common say together: evaporation, condensation, precipitation. (p. 75)

Ms. L also helped her student who was in difficulty in asking questions. For instance, one of her students asked a question that was not clear. Her student asked about *what leaves that human can eat*.

(69) What do you mean some leaves? Yes. Spinach, why? What do you mean cannot eat? Eatable? We can eat, you mean human, the human, people. Human can eat vegetables, yes, why we cannot? Why we may not, may not eat other vegetables? What kind of vegetables that we may not eat. Poisonous one, poisonous, yes, because it's poisonous. We don't say it's a poisonous, it become poison but we can use that leaf as a medicine. (p. 69)

In addition, Ms. L also gave correction.

(70) Dissolve means become one, become one with the water. Yummy, not yum. We put four sugar cube. (p. 80)

In Ms. V class, the writer also found that she gave correction on mispronunciation. Here are some examples.

(71) Have you ever seen chalk? No, no.. I don't have sample chalk. Chalk. Chalk not chop but chalk… chalk not chop but chalk, so please be thankful that our school is quite modern so we don't use any chalk. (p. 96)

(72) Not 'Komunity' but community. The same with communication.. c..o..double m… means you pronounce it as "COM" community.. communication. (p. 99)

(73) Banana boat not banana but. Banana boat. (p. 102)

(74) Do you know glide? Glide is like this, just like an egg of lying but in the water. Do you know the symbol of the logo in Indosiar? So do you see the picture the fish with the wing with the fin and then glide? Do you know glide? Hello, can you spell glide? What make fish glide, the fin or the tail? (p. 104)

(75) Octopus not octupes. (p. 105)

(76) What is the special, do not interrupt, what is the special from the feet? P3, not webbet, webbed. Every body say webbed, not webbet. That's broken English. Webbed. (p. 105)

(77) Duck, swan, and this one this mammal, muskrat. Not muskret, but muskrat. Hallo, muskrat. (p. 105)

(78) Actually not bounce, but because the elasticity is quite hard that's why you cannot cut it with spoon directly, because it is very flexible, it is very elastic. Pudding not padding. (p. 107)

Another feedback that she gave was by spelling the difficult words.

(79) The English of Tratai is Lotus. Water lily also..also in the water.. in the pond. I'm not sure sorry. L..O..T..U..S … T..U…S yeah Lotus. (p. 100)

(80) Do you know to spell drizzle? D r i z z l e. drizzle...Evaporation condensation precipitation. Evaporation, menguap naik,

condensation become very cloudy, precipitation become rain. Evaporation, condensation. C o n d e n s a t i o n. (p. 111)

(81) The stirrup vibrate against the cochlea, causing the fluid...causing the fluid...fluid...F L U I D. fluid.... liquid? OK. Liquid or fluid...causing the liquid or fluid to band the hair band b a n d band... ya... to band the hair in the cochlea in the stimulating their fibers... stimulating their fibers...fibers... F I B E R S. (p. 91)

Interesting thing was found when Ms. V was explaining the words or sentences. She gave translation in Indonesia for some words.

(82) No, no, not become bigger, not mengembang which is lighter which is heavier...Evaporation, menguap naik, condensation become very cloudy, precipitation become rain. Evaporation, condensation. C o n d e n s a t i o n. This is the cycle. Become circle. Bukan muter. The sun heat, it condense, it evaporate go up to the sky and then collect together this is we call condensation. Menjadi titik titik air. It cannot carry anymore, it drop become rain. We have done this before. Continue. Salt. Ok stop. Sometimes we can feel that the rain is hot it happens because the bump each other. It becomes very hot rain. If we touch the cloud, it's not wet, it's kumpulan udara, lembab. The cloud is kumpulan udara. (p. 111)

The writer noticed that it happened because the students misunderstood about the concepts that she tried to explain. Then she translated them to bahasa Indonesia.

Providing feedbacks on the language was also shown. She explained to the students how they have to answer the question if the question is using *how* and it needs some explanation. She also gave correction when the students mispronounced the words.

The writer noticed that many feedbacks were given by the teachers when the students mispronounced the words. Ms. L and Ms. V gave correction on that mispronunciation. They corrected the students' pronunciation. In addition, sometimes they asked her students to repeat the words after them for several times.

The writer concludes that providing feedbacks on language through restatement will happen when students do not have good English. The students in Godwins Elementary School have good English because they have learned English since in the playgroup. This helps them to understand the meaning of materials better.

Conclusion and Suggestion

Conclusion

Based on the observation that the writer has conducted, this study supports the theory that points out by Fathman, Quinn, & Kessler (1992). The writer conducted the observation of the speech modification by the science teachers in presenting science in English. The observation was intended to see how the science teachers made their language more

comprehensible to English language learners by modifying how they talk in a number of ways.

The science teachers introduced less than twelve new words in every each lesson as suggested by Fathman, Quinn, & Kessler (1992). Sometimes the science teachers used words with personal references in her lesson. But the writer thought that not all topics require personal reference, that is why in the observation the writer did not find the use of personal reference in each lesson.

The science teachers used shorter and less complex sentences in presenting their lesson. Even though sometimes Ms. L still used long sentences but she tried to explain for many times until the students understood the lesson. Repetition of words or sentences also appeared in the science teachers' lessons. The repeated words or sentences depended on the difficulty of the concept. The teachers would repeat the words or sentences for many times if they thought that the concept was too difficult for the students. The difficulty of the words depends on the teachers since the teachers are the ones who know the students' ability.

The science teachers interspersed questions during their lesson. Sometimes they gave the questions in the beginning of the lesson, but also in the middle or at the end of the lesson. The science teachers also gave feedback on language. Even though the writer only found one feedback through restatement, they gave feedback on language by correcting students' pronunciation.

The writer concludes that when science teachers modify the speech, the learning process becomes effective, as suggested by Fathman, Quinn, & Kessler (1992). Students can understand the concept well, as already found that the science teachers . It was shown when the students could answer the questions well.

Suggestion

As suggested by Fathman, Quinn, & Kessler (1992), there are many strategies to teach science concepts successfully to English language learners whose teachers can make their language more comprehensible. The writer has only done one of the strategies, i.e., modifying language. Here, the writer would like to give suggestion for further research.

1. The new researcher can explore the other strategies, such as teacher collaboration, student collaboration, relevancy of science lessons to students' everyday life, adapting science materials, and using language teaching techniques in presenting science concepts.
2. The new researcher can compare among teachers who know the strategies of integrating science and language and teachers who do not know any strategies.
3. The new researcher can also compare among teachers who know the strategies of integrating science and language.

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