LOGICAL MATHEMATICAL INTELLIGENCE TOWARD STUDENTS PARTICIPATION AND CHARACTER BUILDING IN INDONESIA

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Abstract

In Indonesia, participation in English Language Teaching (ELT) profoundly challenging for the students. This research is directed to find the students participation in classroom, specifically in foreign language class and its support. This research is case study toward the teaching learning process in teaching learning process especially in Vocabulary class. The subject of this research is the students who are taking Vocabulary class in teaching English Language Teaching. Meanwhile interview, questionaer and observation are applied to gain the data. Those techniques are directed to gain the data for students participation. The interview were done toward students during classroom and also after classtime. Observation was conducted directly in teaching learning process, and in the end of the class they are given questionaer to be fullfilled. The triangulation method were done to ensure the validity of the data. The researcher used different sources and also tecniques to maintain the valid data. After the data were accurately collected, they were then analyzed using descriptive qualitative research. The result of the research shows that there are two kinds of activities dominating the participation of students, they were taking into account while lecturer explaining material (75%) and asking about matter learning which haven't been understood (65%). Integrating logical mathematical intelligence in EFL class provely increase students participation as well as enhance students character. This research constribute to the development of applying innovative strategies and approaches in English language teaching in Indonesian since it growth as fast the demand in society life.

Key words: English Language Teaching, logical mathematical intelligence, participation, character, case study

Introduction

English Language Education is one of the favorites program in Indonesia. It was impacted toward the heterogeneous of the in put, the students came from different level of English profiency. Some of them are really talented meanwhile others are in various level of competences. Teaching learning process in forign language classroom constitues an activity requiring students motivation and talent to take participation. So that why, students who are less of these demand will find some difficulties in following the class.

Vocabulary class is one of interesting class for the students. Understanding the vocabulary in

general considered as an essential part of the learning process a language or the development of the ability of a person in a language that had been controlled .Students at schools often taught new words as part of this particular subject and also many adults who regards the formation of a vocabulary as an activity that is attractive and educative.

Vocabulary mastery was the most fundamental that must be controlled a person in the learning of languages of england who was a foreign language for all the students and the indonesian public. How someone can reveal a language when he did not understand the vocabulary of that language. Let alone if learned it is a foreign language , so that mastery a vocabulary that language is something which absolute owned by language learner. If a student having the treasury of english words adequate and automatic would be more support on achieving four competence English last. Likewise on the other hand without having vocabulary that adequate one of the students are running into problems in achieving competence speak above.

Vocabulary constitutes elements of language that supports completeness language. Schmitt (2008) didalam Biswas (2013) states that *an individual requires to learn the use of five to seven thousand words for articulate conversation, and around eight to nine thousand words for reading and comprehending a written material.*

Meanwhile, Pikulski and Templeton (2004) states that

…implications for instruction that will ensure the development of large, useful vocabularies: wide reading

plays a critical role in developing knowledge, and teachers facilitate this process by teaching strategies for learning words independently, including teaching morphological units, the use of dictionaries and other reference works, and exploring the link between spelling and learning words. Teachers should also directly teach important specific words, and they should develop and sustain students' interest in and curiosity about words.

Besides the strategies above there is a need to the ability of a lecturer to motivate students to participate in vocabulary class. It was caused by the low participation in student learning Nunan in Rocca (2010) *found that an average of only around one minute of a 40-minute class period was spent in student participation*. Pearson and West (1991) and West and Pearson (1994) in Rocca (2010: 189) *found that students asked only 3.3 and 3.6 questions per hour of class time, respectively, and around 73% of these were in reference to procedures, content, or clarification* (West & Pearson, 1994).

During pre research, it was found that most students did not participate actively in Vocabulary class. When lecturer asked them to answer question, guess the meaning from context, give a free definition, they just keep calm and feel afraid to take participation. Students said actually they want to participate in class to respond lecturer's invitation, but they have problem to find any idea. They found difficulties to think about the context to be predicted, they did not have any idea to defines any terms.

Seeing the complication of teaching learning in vocabulary class above, so involving students inner

potential is deadly needed to increase students particpation. Since stduents problems were about exploring idea to respond questions or statements, so applying Logical-mathematical intelligence in class is a genius solution. Logical mathematical intelligence consists of the capacity to carry out mathematical operations, analyse problems logically, and investigate issues scientifically. In Howard Gardner's words, it involves the ability to detect patterns, reason deductively and think logically. This intelligence is most often associated with scientific and mathematical thinking. It uses numbers, math and logic to find and understand the various patterns that occur in our lives: number patterns, visual patterns, thought patterns, colour patters and the list goes on.Sri Handayani (2015) states that involving students intelligence will enhance students profiency. Logical mathematical intelligence is one of multiple intelligences that can help them to be active in class. This intelligence help students being skilled at deductive reasoning, detecting patterns, and logical thinking. During classtime they can participate using their logical thinking of the material being delivered. People with logical/mathematical intelligence are good at scientific investigations and identifying relationships between different things. They are also good at understanding complex and abstract ideas. In terms of taking Vocabulary class, the students can easily identify some aspect of vocabulary, for example in recognizing word formation, the students can identify base form by thinking logically the nominalization of word. Each of students has this intelligence. And the duty for the lecturer is that how to explore these intelligence in class. This

intelligence will also encourage students to have high characters since by exploring their intelligence in logical thinking, they can be an independence person, more tolerant and thinking first before saying thing. This avoid them to be a cheater, to do so they become a stronger character student. It was not realized by some educators. Students caharacter actully can be built through their own potential.

Seeing the complication of teaching learning in vocabulary class above, so involving students inner potential is deadly needed to increase students particpation. Sri Handayani (2015) states that involving students intelligence will enhance students profiency. Logical mathematical intelligence is one of multiple intelligences that can help them to be active in class. This intelligence help students being skilled at deductive reasoning, detecting patterns, and logical thinking. During classtime they can participate using their logical thinking of the material being delivered. People with logical/mathematical intelligence are good at scientific investigations and identifying relationships between different things. They are also good at understanding complex and abstract ideas. In terms of taking Vocabulary class, the students can easily identify some aspect of vocabulary, for example in recognizing word formation, the students can identify base form by thinking logically the nominalization of word. Each of students has this intelligence. And the duty for the lecturer is that how to explore these intelligence in class. This intelligence will also encourage students to have high characters since by exploring their intelligence in logical thinking, they can be an independence

person, more tolerant and thinking first before saying thing. This avoid them to be a cheater, to do so they become a stronger character student. It was not realized by some educators. Students character actully can be built through their own potential.

Research Method

This research is case study toward the teaching learning process in teaching learning process especially in Vocabulary class. In this case study, the resecher conducted an in depth study of a particular situation, that is students participation during teaching learning process. It was done in case of narrowing down a very broad field of research into one easily researchable topic. Whilst it did not answer a question completely, but it served some indications and allow further elaboration and hypothesis creation on a subject. This case study research design was also directed for testing whether logical mathematical intelligence actually work in classroom. To gained comprehensive and holistic data, this study was conducted during a semester. The subject of this research is the students who are taking Vocabulary class in teaching English Language Teaching. Meanwhile interview, questionaer and observation are applied to gain the data. Those techniques are directed to gain the data for students participation. The interview were done toward students during classroom and also after classtime. Observation was conducted directly in teaching learning process, and in the end of the class they are given questionaer to be fullfilled. These triangulation method were done to ensure the validity of the data. Data triangulation was applied in this research to assure the validity of research through the use of a variety of methods to collect data about students participation. It

was aimed to capture different dimensions of the same phenomenon. The researcher used different sources and also tecniques to maintain the valid data. The result of interviews was checked by the data gained from observation. After the data were accurately collected, they were then analyzed using descriptive qualitative research by orderly conducting data collection, data reduction, drawing conclusion and verification.

Research Finding

This research was conducted in September 2015. Based on the prelimenary research conducted before the research, it was found some problems dealing with the students participation during teaching learning process. Those identified problems are students' pasiveness in responding stimulus both from lecturerr and also other students; less motivation to expresse ideas, finding difficulties in gaining ideas, lack of self confidence to particpate and many others phychological obstacles. Based on this problems, the researcehr propose an innovative solution to overcome the problems by integrating logical mathematical intelligence in classroom. It was aimed to help students improve their logical thinking so they are helped to participate. This intelligence is one of multiple intelligence that every human life has. Based some researchs finding, this intelligence can enhance student active learning since it drive the students to be a "an independent person". The highest domin of learning theories enquired students intelligence. It can be said that involving students intelligence help their succes both for the process and also result of learning.

Based the result of the collecting data through interview, questionaer and observation to the seventh semester students, it was found that students

participation is better increased by the integration of students intelligence. The researcher conducted observation towards teaching learning process of the fourth semester students in vocabulary class. The lecturer employed students centered learning in each of students are invited to parcipate actively sake for the exploration for their vocabulary use. Based on the interview, the students who were actively in class are help by their logical thinking, it was relly help to express their idea.

Meanwhile those who were not eager to expose their logical thinking tend tobe passive in class. This finding shows that integrating logical mathematical intelligence is needed to help students participate through logically responds toward stimulus given by lecturer.

In this study, the researcher conducted interviewed towards more than 25 students , and the result were explained detaily in this folloowings table:

No	Students Participation	Percentage
1	The students taking into account when lecturer was explaining the learning material	70%
2	The students listen to the explanation as the lecturer explained exercises	55%
3	The students practice what the lecture write in white board	40%
4	The students give some comments towards the material	40%
5	The students asked teaching material learning which haven't been understood	65%
6	The students ask their friends about matter learning which haven't been understood	65%
7	The students interrupted during the teaching learning process	45%
8	The students taking a note during the class	65%
9	The students fullfill the questionaer given by the lecturer	35%
10	The students answered the lecturer question during the discussion	35% 35%
11	The students do for the exercises independently	40%
12	The students do exercise in groups	40%
13	Students finished their task on time	25%
14	Students are actively involved in class	40%
15	Students answered the questions during the teaching learning process	55%

The research shows that students motivation to take into account an explanation when lecturer was explaining the material was 70%. Students participated in class since they want want to know briefly about a definition of a new word. When a lecturer mentioned a technical terms in vocabulary, for example: lexical density. A student directly raised his hand and asked the lecturer to difine and describe clearly about what is lexical density, furthermore he aske lecturer to describe how is lexical density can be found in a text.

To take participation, the students listen to the explanation as the lecturer explained exercises. To do this, they have clear instruction about how to finish the exercise from lecturer. Students who put their high concentration to listen thye instruction will be more easily to do the exercise. It helped them to participate during the exercises review.

During teaching learning process, the students practice what the lecture write in white board. While explaining

the material, the lecturer usually wrote some examples in white board. For some students, they did not only imitate the lecturer writing but also make their own example as a practice. This help students one step ahead from their friend to paricipate, since they did not wait the lecturer instruction to find further examples.

While the lecturer was explaining, the students were invited to give some comments towards the learning material. " *What do you think about these word*s?" lecturer asked. And there was some responses from students such as " *difficult, too many words, interesting*, etc". Some students were happy to participate since their responses just in words.

In the fifth meeting, lecturer explained about word formation. Since these theme consisted of some topics and being discussed in one meeting, so they found some difficulties and they were asked about teaching material learning which haven't been understood. Some students asked about how can they recognize the root of a word.

One of students participation activities is the students interrupted during the teaching learning process. While lecturer explaining learning material, some students often interupt him. This interuption were asking more explanation from lecturer, asking for a clear definition and asking lecturer to repeat his explanation.

In delivering Vocabulary lesson, the lecturer some time pause from time to time and ask students to take a note during the class, moreover they were asked to paraphrase what they have written in their notes -- to rewrite definitions, to restate relationships, to retell an examples. Students were asked to develop learning material using their own words. Then the lecturer asked them to participate in class by expressing their own paraphrase.

Since there was a complain that students found difficlties to participate in class discussions, so the lecturer conduct both oral and written discussions. Written discussion help shy people or those who are having trouble with English to add their ideas, at their own pace. Oral test was mostly conducted in class. In this discussion, the students answered the lecturer questions during the discussion. Addressing questions was done to stimulate students responses. When the lecturer ask questions, he is modeling a process that students can and should use themselves; encourage the students to use the following questioning strategies to assess what they have learned and to develop their thinking skills.

In attracting students participation, lecturer asked students to do the exercise independently. This forced them to have their own ideas, meanwhile basically participation was inititaed by working individually. Lecturer also have success by incorporating purposeful goals in classroom instruction. If students can be motivated into exploration and discovery in any subject, they will set certain goals for themselves in the classroom. The lecturer, by encouraging such goal setting, cultivates their focus even further. By testing and analyzing unique ideas, the classroom can grow students' attentional capacity and show them the value of and methods for thinking independently. Only through strategy and design, the classroom become a laboratory of focus and attention.

The result of the research shows that there are two kinds of activities dominating the participation of students,

they were taking into account while lecturer explaining material (75%) and asking about matter learning which haven't been understood (65%). These activities was fully invited by applying logical mathematical intelligence in Vocabulary class. Lecturer explored students' ways of thinking to direct them in taking participation. Each students were given the same stimulus to do the participation activities. The differences responses from students varied in taking participation covering the quantityand quality of the participation.

Discussion

There are several participation the students that was happen in routine in every lecturing; namely the students focus on the explanation, the students practice orally in classroom, the students ask about learning material being understood, the students noted learning material described by teaching, the students fill chief about vocabulary class, the students do exercise independently about, the students do exercise in group , and the students finished the task timely in every lecturer. All this activities was created by lecturer to increase students participation thourgh integrating their logical mathematical intelligence. This inteligence strongly help students to explore their ways of thinking to get any idea. To do so, students was helped to participate. Doing participation drives students to be an active, independent, responsible and honest individual. To have these typical enhance students characters. By allowing students to participate more and more would make them become a strong character human, specifically the students were able to have strong social intelligence. So it was a great choce for lecturer to integrate students intelligence in buillding students character. Handayani (2016) states that

multiple intelligence approach help students improve their character. Psychologically, learning process was interelated to the development of students inner potential,specifically their intelligence. As well as in learning Vocabulary in English language teaching, this interelation existed during students participation activities.

The students logical mathematical intelligence was explored in class by allowing them to think indepently about learning material. So, the students can use their own logical thinking to give any comment and answer during the class and other participation actvities. When a student explored their intelligence they will be able to think logically which one is correct and which one is not. This can be their strength to be brave in taking the participation. The integration of multiple intelligence in delivering material drove students to enhance their character. As intelligence reaches a certain point, it could be argued that it can suport students in changing their behavior as the result of learning process. This would suggest that there is a relationship between intelligence and learning activities.

Immersing students to their own way of thinking during teaching learning process will drill them to solve the problems. Unconsiously, they were digging their own inner potential in learning process. Without integrating their intelligence, students had many opportunities to rely on themselves to their friends, they never know who they are, how is their competence, as well as they did not accustom to solve problems, creat product by themselves.

Use of logic and mathematical models to represent and work with ideas. Grammar analysis falls into this type of learning style. Lecturer can feel that

English teaching syllabi are too loaded towards grammar analysis which has little to do with communicative ability. Nonetheless, using a balanced approach, grammar analysis has it's place in the classroom. Unfortunately, because of certain standardized teaching practices, this type of teaching sometimes tends to dominate the classroom. This inteligence was one of the multiple intelligences which were interelated each other. Lecturer are well aware of the fact that every classroom is full of students who are different from each other in many different ways. Each student comes from a different social, economic and cultural background, each one has different areas of interest, different ways of expressing themselves, different strengths and weaknesses, and now the teacher is being asked to be aware of the fact that each student also has their own individual intelligence profile. Obviously all of these factors can affect the student's learning process.

The 'traditional' classroom tends to treat students as a homogeneous group, with the lecturer presenting the same exercises to all students at the same time, and expecting the same answers to be produced within similar time limits. Students are expected to absorb the knowledge presented by the lecturer with a strong emphasis on the use of language and logical-mathematical analysis. Most academic knowledge is presented for learning by means of an extremely limited (or limiting) methodology and the acquisition of that knowledge is evaluated by means of rote tests, whereby the best grades are assigned to students who demonstrate the greatest ability for memorization. Lecturer are aware of the diversity in their classrooms. They know it is important to learn something about their students in order to invest more efficiently in the teaching-learning process, but it is not always clear what kind of knowledge would be most relevant and in what way this knowledge can be acquired.

Conclusion

From the result of the research, it can be concluded that there are several participation the students in Vocabulary classtaking nto account while lecturer was explaining the material, the students practice orally in classroom, the students ask about learning material being understood, the students' noted learning material described by teaching, the students fill chief about vocabulary class, the students do exercise independently about, the students do exercise in group , and the students finished the task timely in every lecturer. Lecturer lead students to explore their own intelligence to improve their participation in class. All this activities reflected that the lecturer integrating students intelligence in buillding students character. To do this, students were helped to enhance their character.

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