Activating students' cognitive perspective using problem-based learning in Efl speaking

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Abstract - Speaking as one of the skills in mastering English must be taught and learned in junior and senior high school of Indonesia. Problem-based learning (PBL) is an appropriate strategy to assist the students in their speaking skills learning. The cognitive perspective also takes accountability on this research due to students' perspective toward the PBL that moreover influences their speaking skills. The purpose of the research is to explore students' perception of problem-based learning also to discover the phase in PBL that delivers students' cognitive aspect in the speaking classroom at the second-year students of SMAN 1 Krw. Qualitative research was used as the research approach with descriptive research as the method of this research. This research took place at SMAN 1 Krw by taking the XI IPA 5 class as the sample with six research participants. They were chosen by purposive sampling. All of the data was gathered through observation, students' reflection journals, and documentation. It was found that the use of the PBL technique was able to assist the constraints of students in solving a problem along the way with their cognitive perspective while speaking it out. Moreover, the researchers also discover that PBL and cognitive perspective hold strong intercourse between each other, the phase-in PBL goes along with human mental processes, particularly in cognitive views. Furthermore, it shows how PBL assists students in their problem-solving skills with their cognitive views and how it triggered them so they can elaborate on it in front of the class. PBL and speaking activity were two items that always go right together.

Keywords: cognitive perspective, problem-based learning, speaking

1. Introduction

As of late, there has been a spate of enthusiasm for problem-based learning (PBL), which has picked up consideration across various orders at a more elevated level of training. Teachers have progressively worried about understudying troubles in building up a solid and strong information base (Koschmann et al, 1996). As per Guide to Problem Based Learning characterizing PBL, "An instructing and learning techniques which put a difficult first, and in which further learning is led with regards to that issue." Barrows (2006) stated that PBL helps their understudies build up the capacity to deliver linguistically right, sensibly associated sentences that are suitable to a particular setting, and utilize satisfactory elocution.

Problem Based Learning is active learning on the use of ill-structured problems as a stimulus for learning. In PBL, the start point of learning is the discussion and analysis of a problem rather than acting as the endpoint. So, based on the opinion above, Problem Based Learning is the method that solves the problem based on the current issues. Problem Based Learning would effective in activating prompt speaking of students as they are focusing on solving the problem and on helping them to interact with peers as well. In addition, researchers are also interested in cognitive psychology, which refers to the process of people processing information the symbol by the brain, and its primary theoretical purpose is to explain the method of information processing during human activity, it leads students to encouraged to discuss and overcome the project problem. In teaching English, cognitive psychology pays more attention to encourage the role of concepts and situational parts of the textbook, which is a further development of student intelligence to increase student competence for language use.

The reason is that the teacher can stimulate students' curiosity about problems that occur around and around students. The first research focused on the effects of PBL on speaking, and other studies focused on writing skills. In this study, researchers wanted to analyze the implementation of PBL in a speaking activity. Based on the discussion about PBL in terms of cognitive perception, a few previous kinds of research concern how PBL is perceived by the cognitive domain in a speaking activity. Therefore, it is essential and needed to conduct a study on how PBL in teaching speaking perceives cognitive perspective. This research explores students' perception of problem-based learning in the speaking classroom, also discovers the phase of PBL that delivers students' cognitive aspects in speaking class. The researchers compose the following research questions for that purpose: 1) How do the students perceive Problem-Based Learning in learning to speak? 2) In what phase of the Problem-Based Learning do the students deliver cognitive aspects in speaking class?

Speaking is a process in which somebody expresses their idea, opinion, and also suggestion through an ordinary voice and at least two people need to speak. In teaching and learning languages, speaking is a skill to master and practice as well. It means speaking is productive oral skills. It includes producing systematic verbal sayings to confess meaning. Also consider speaking as a skill, gate (Liao, 2009) investigating the difference between knowledge and expertise in speaking lessons, which he viewed as necessary in speaking teaching. Indeed, to be a learner who is good at speaking, learning knowledge about grammar, vocabulary, pronunciation, intonation, etc. is not completely sufficient but the skill to use this knowledge to communicate successfully is indispensable. In this study, the term "speaking" will be used to refer to skills related to the language of teaching and learning through a door (Liao, 2009) there are several elements of speaking skills. a. Accuracy is recognized; accuracy is one of the most important criteria for measuring linguistic abilities and user language storage from destruction communication. Speaking is an interactive process for generating and receiving information from others through conversation. Bailey (2003) argued that "speaking is an interactive process for building meaning that involves the production, reception, and processing of information" in the teaching and learning process. This means that speaking allows students to receive information from people through their conversations; they must understand the information and respond to that information. Moreover, speaking is using oral products to

develop communication competencies to learn young students before they learn to read and write.

According to Levin (2001), problem-based learning is a teaching method that includes students applying critical thinking, problem-solving skills, and subject awareness to specific problems. What is provided by problem-based learning is free of charge (let students decide for themselves what they want to do. Therefore, be able to be involved or inspire students to explore their key subjects in English. As a result, it will help them develop their speaking skills. Problem-Learning is a way for students to connect, discuss and solve their learning issues, which will eventually enhance their speaking skills day after day. Various Problem-Based Learning developers have described the learning model as having the following features (Krajcik, 1999).

a. Driving questions or problems
b. Interdisciplinary focus
c. An authentic investigation based on problem-instruction
d. Production of artifact shows exhibits
e. Collaboration

Cognitive Perspective

Cognitivism includes researching mental processes such as feeling, perception, attention, encoding, and memory that action is unwilling to understand because cognition exists in the "black box" of the brain (Jordan et al, 2008). The first principle is the sensation. This shows how stimuli originating from external stimuli is listed in sensory before being sent to the following process. The second principle is a perception that shows as a process for interpreting and making sense of something that can be seen through our understanding. It consists of a recognition pattern, a recognition object, a bottom up or top-down processing, and conscious perception. The third principle is attention that emphasizes concentrating on one thing, which is more important than the other. It is important to determine awareness. The fourth principle is coding as a cognitive theory principle focusing on the importance of coding information after something is felt and attended to stimuli.

The way to encode information can be done through organizing and then forming in the form of a scheme. In this case, to encode information in the form of experience can be done in two ways. They are bottom up and top down (Jordan et al, 2008). Bottom-up is a means to encode experiences by dispatched information obtained through the outside world. This is mediated through attention and perception. While the top down is another way to encode experience, this is in the form of action before knowledge to assist in interpreting the bottom up. The fifth principle is a memory. Memory is the ability to keep and remember information in our minds.

The theoretical support for a metacognitive view of the PBL in the development of self-directed learning skills is drawn up based on the information processing theories of transfer as well as sociocultural theories such as cognitive apprenticeship (Hmelo & Lin, 2000). Such a theoretical support is appealing, for the information transfer and cognitive apprenticeship imply that learning is active and progressive, that the processes involved in active learning are integrated and directly evidential of individual talent development.

This attractive logic is further extended by claiming that, in the PBL, students can continually apply their knowledge and accordingly are gaining incremental practice of their learning strategies of self-directed. Such a common ground between problem solving and incremental self-directed learning suggests a naturally occurring osmosis that can predict not only talent growth but also talent growth that is transferable across novel problems (Hmelo & Lin, 2000). In the other words, the PBL offers a form of learning that is transferable. With the assumptions of cognitive apprenticeship and transferable learning, the active learners' needs will appear to change on what was a need becomes "background experience" and, in turn, the

background experience appears to serve as a prompt or a guide to empower the learners to independently access "the necessary information."

Another previous about PBL and cognitive area is also explained by Horton, (2014) in the article entitled "The effects of problem-based learning scaffolds on cognitive load, problem-solving, and student performance within a multimedia enhanced learning environment." The research led to better understanding the role of scaffolds in promoting optimal levels of cognitive load and enabling productive problem-solving within open-ended learning environments. Findings from the study suggest that additional research is required to further refine our understanding of cognitive load, the relationship between cognitive load and constructivist learning environments, such as PBL environments, and the specific needs of middle school students and teachers with respect to problems and problem-solving, science instruction, and pedagogy.

2. Method

The qualitative approach used in this analysis is to learn how PBL is interpreted in the cognitive context of speech expression, the researchers studied teaching action and student actions. The site of this research is located in SMAN 1 Krw specifically in Science Class 5 Grade XI. The class consists of 36 students. The participants of this research are 9 students in 3 different levels of speaking proficiency. This class was chosen by the researchers based on the PLP experiences. There are many students who are interested in speaking but still are not able to find the right methods for learning in speaking classroom. The main reason why choose SMAN 1 Krw is because the easy access that the researchers already got, and one of the researchers is an alumna in this school, also, was doing a PLP teaching there, the school has already given permission to do the research, and fully support the researchers. In collecting data, researchers were using three methods, namely, observation, self-reflection journal, and documentation, data collection is allowing us to collect information that the researchers needed in this research. Starting from observation, the observation was held in SMAN 1 Krw on November, 28th, 2019.

Researchers use observation guidelines to make field notes to obtain more detailed information in the teaching and learning process. It was done to get actual and credible information about students' cognitive aspect towards the Problem-Based Learning process. The researchers collected text and image of the classroom observation such as photos, and field notes. Next is, in this study the researchers decided to use reflective journals to explore situations from students' perspectives, but generally in the context of learning from students' own experiences. Here's the question that used by the researchers as a form of students' reflection journals are (a) What do you think of this technique of learning to speak? and (b) How do you feel about this activity?

The researchers got documentation when did the observation process. In this research the researchers took the picture when learning and teaching using the PBL model in speaking classroom process in the classroom and outside of the classroom, syllabus, lesson plan and the other documents to complete the data. The methodology used in this study to analyze the data is the model of analysis that detects the phenomenon in the data and classifies it into similar present themes (patterns). There are three steps in using this methodology based on Miles & Huberman (1994), namely data reduction, data showing, data conclusion-drawing / verification.

3. Results and Discussion

3.1 Student's perception in Problem Based Learning activity towards the speaking classroom.

In the process of problem-based learning activity, one of the main focuses is speaking skills. Students are required to be able to generate their problem-solving skills through the issues that are already given and they have to elaborate their ideas. This problem-based learning technique

gave students freedom in solving the problem based on their own opinion. Thus, they will elaborate their opinions after they discuss the problem with their peers as well. The 9 respondents provide proof about how students felt, thought, and what is the issue towards the problem-based learning in speaking classroom.

a. Student 1 explained that they thought this way is effective for speaking classroom, it triggers them to be active, they thought the only lack of this technique is the time management of the teaching learning process.

b. Student 2 explained that this technique really helps them in the learning process, also they are interested in this activity that helps them to be brave to give their opinion, dare to argue, and solve the problems especially when they speak it out in front of class.

c. Student 3 explained how the PBL helps them, but they thought the applications of this technique depends on the people that were involved in the discussion.

d. Student 4 explained that in these materials there is no difficulty and they thought it's useful for them in real life, they also thought the presentations quite trained their confidence to practice speaking in front of class.

e. Student 5 explained that this system of *pbl* activity is good because it can teach them how to give opinions, gain knowledge and solve problems.

f. Student 6 explained that this way of learning is good to train their ability of speaking in front of the class while expressing their own opinions.

The students' responses above show that this problem-based learning activity is so beneficial for them and makes it easy for them to elaborate on their own opinions. This is considered to improve their ability to overcome real-life problems using this method. Moreover, it is effective for them to learn to speak with this technique because it is their ideas. However, the issues that they faced during this activity is likely about their peers not being cooperative in the discussion, also the time management should be made as effective as it should be.

3. 2 The phase in Problem Based Learning that students' deliver cognitive perspective.

In this process of finding the second theme is using the observation technique, the researchers observed the classroom before, during, and after the PBL class, the researchers have already made an observation guideline that made it easier to observe the class related with PBL and the student's cognitive perspective.

a. Pre-Observation Class

The researchers have already set the goals for the class that the student will realize how PBL will beneficial in their real-life problem in the future days and how they overcome that, the goals also is that the researchers hopes students will gain to get motivated to learning to speak using this kind of technique, especially in the problem-solving skills. According to Bailey (2003), "Speaking is an interactive process for building meaning that involves the production, reception, and processing of information."

b. Post-Observation Class

In post-observation, the researchers reflect how the class went after the learning process. In general, the class went great and students seem so interested in PBL activity, it showed also in students reflective journals that they claim that they are enjoying this class. The teaching process itself also went good and students seem focused on what the researchers explain. First thing first, the researchers give students the materials about 'Giving Opinions' according to their handbook that they used for the entire semester, the researchers also give them the template about how to start to deliver their own opinions, using the PPT as the media. Later on, on this session of 'Giving Opinions,' the researchers asked the student to write down their opinions by giving them the topic that written on the whiteboard, the issue is related with their environment such as "Beauty Vlogger on Youtube" "PUBG Game" "Math in School" after giving them some time, the researchers ask who wants voluntary deliver their opinions in the front of the class, this is one of the ways to set the class so they used to this kind of activity before they do the real PBL activity.

Before the class was over, the researchers divided the students into 4 groups and gave them the PBL materials and they got one week before the presentation day. Moreover, during the group discussion, students have to discuss the issue with their peers in a group, as captured in all pictures that show group discussion during the PBL class. Students seem to discuss the problems with their peers using English as well, and it went well during the presentation and it worked almost perfectly well. Also, in Krajcik, 1999, another phase that passed by this activity is Collaboration that is PBL is characterized by students working with or others, most often in pairs or small groups, working together to motivate ongoing involvement in complex tasks and increasing opportunities for joint inquiry and dialogue and development and social skills. Furthermore, another phase that students use their cognitive perspective is when they are generating their opinions toward the issue and how they solve the problem. Krajcik (1999), mentioned that another phase in PBL is an authentic investigation based on problem-based learning, it explains how PBL requires students to pursue authentic investigations that seek real solutions to real problems. They must analyze, define problems, develop hypotheses, and make predictions, collect, and analyze information, make conclusions, and draw conclusions. This certain phase in PBL went along with the principle of cognitivism as a study of mental processes that includes sensation, perception, attention, encoding, memory (Jordan et al, 2008).

The researchers' goals that are stated in the early pre-observation session come to its realization and most of them reach its goals. The researchers have already given one week for them to learn about the problem and it is in line with one of the phases in PBL according to Krajcik (1999), that is Interdisciplinary Focus, it is explaining about how the actual problem investigated is chosen because the solution requires students to learn a lot of subjects, and one week is the ideal time for them to learn about the issue.

3.3 Student's perception in Problem Based Learning activity towards the speaking classroom.

Through this theme, the researchers saw that this empirical evidence shows that the use of problem-based learning activity can have a positive impact on students in thinking, developing, and elaborating their own opinions to overcome the problems, along with their speaking skills. Kreitner (1989) says that perception will lead to changes in attitude, motivation, and behavior, student perceptions will influence when activities speak English in the classroom, which relates to student attitudes, motivation, and even experiences while speaking English in front of the class. The students showed a positive response through what they wrote about the PBL activity, they thought that this activity helps them for their speaking ability because they discuss it with their peers in group, the less pressure to learn led them to the good improvement of teaching learning activity. The opportunities for students to master a speaking skill through this problem-based learning activity are more likely to be effective in the learning process. It is in line with Levin (2001), Problem Based Learning is a teaching method that involves students to apply critical thinking, problem-solving skills, and content knowledge to real problems. The students showed how their problem-solving skills quite indicate the good positive in the learning activity, they felt this activity let them dare to argue, generating their own ideas and proceed all that in the form of presentation in front of the class. The only issue that they faced is how their peers were cooperative or not in this PBL activity. Moreover, they thought the struggle it's from their peers that involved in the group discussions not able to cooperate well while discussing the issue, some of the students indicate that they are not interested with this learning so they can be one of the obstacles in some group, the students that were not interested in this activity seems not giving the same energy as the interested one.

3.3 The phase in Problem Based Learning that students' deliver cognitive perspective.

As the findings above, the researchers find that PBL activity has a strong relation with how students' cognitive perspective works. The table below showed how the PBL phase and Cognitivism are likely to be related to one with another. According to Jordan et al (2008),

cognition appears in the "black box" of the brain, because cognitivism involves the study of mental processes that includes sensation, perception, attention, encoding, and memory. Moreover, it is in line with Krajcik (1999) that explains various phases in PBL that includes analyzing, defining problems, developing hypotheses, and making predictions, collecting and analyzing information, making conclusions, and drawing conclusions.

Table 1 Cognitivism and PBL

No	Cognitivism	PBL
1	Sensation	Make Analyze
2	Perception	Define Problems
3	Attention	Develop Hypotheses / Make Prediction
4	Encoding	Make Conclusion / Draw Conclusion
5	Memory	Collect and Analyze Information

Problem Based Learning is one of the techniques that let students explore their own opinions through the problem-solving case, it is related to their cognitive views as a human being. Suharno (2010) says that cognitive views take students to become active information processors. This means that cognitive theory tries to create people who will be active to think. The implications of cognitive theory in the field of education are trying to produce students to find problems solving learning findings, cognitive strategies, and project-based learning. In previous research by Hmelo and Lin (2000), explains that theoretical support for a metacognitive view of PBL in the development of self-directed learning skills is drawn from information-processing theories of transfer as well as sociocultural theories such as a cognitive apprenticeship. The table above shows how PBL relates to human cognitive views.

Starting from the first principle is the sensation; this shows how stimuli originating from external stimuli are listed in sensory before being sent to the following process. This one is related to analyzing in the phase of PBL because the student had to analyze the problem right before they hop on their own opinions. The second principle is a perception that shows as a process for interpreting and making sense of something that can be seen through our understanding. It is the same with the PBL phase that defines problems, students have to interpret the problems themselves so they can be understanding the exact problem before jumping into the next phase. Moreover, the third principle is the attention that emphasizes concentrating on one thing, which is more important than the other. It's related to developing hypotheses or making predictions, the students should've focused on this phase of PBL so they can finally make their perception before drawing their conclusion. The fourth principle is coding as a cognitive theory principle focusing on the importance of coding information after something is felt and attended to stimuli. When the prediction is already made, and the students finally draw their conclusion or their final opinions on the issue. Finally, the last principle is a memory, memory is the ability to keep and remember information in our minds. It is in line with collecting information in the PBL phase, students indeed had to collect the information as much as they can to support their opinions.

4. Conclusion

This research aims to document the use of Problem-Based Learning techniques as a means to find a student's cognitive perspective through speaking classroom. It was found that the use of PBL technique was able to assist the constraints of students in solving a problem along the way with their cognitive perspective while speaking it out because this technique could provide students the breadth of generating their ideas for solving a problem with the help of discussion with their peers and also with their cognitive views and bringing up together in a speaking activity. Moreover, students indicate the positive progress on the PBL activity towards their speaking ability by their interest in the PBL activity.

The researchers also discover that PBL and cognitive perspective hold strong intercourse between each other, it was the phase in PBL that go along with human being mental processes particularly in cognitive views, it is within the human brains that with PBL activity, that means human brains also works specifically in cognitivism mental processes that include sensation, perception, attention, encoding, and memory. It shows how PBL assists students in their problem-solving skills with their cognitive views and how it triggered them so they can elaborate on it in front of the class. PBL and speaking activity were two items that always go right together.

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