

The Implementation of Problem-Based Learning to Increase Students' Conceptual Understanding According to Christian Perspective

Hans David Lasut

Mahasiswa Jurusan Pendidikan Matematika, FIP-Universitas Pelita Harapan
hanslasut@gmail.com

Jacob Stevy Seleky

Program Studi Pendidikan Matematika, Fakultas Ilmu Pendidikan,
Universitas Pelita Harapan
jacob.seleky@uph.edu

ABSTRACT

In the world of education, it is important that the teacher considers that the knowledge that students had learned in school can be applied in the different situation either when students still in school or when they are faced with real-life problem. These conditions of inability to apply the knowledge is called lack of conceptual understanding. The researcher then decided to use Problem Based Learning (PBL) to overcome this problem. The aim of this research is to found out whether the implementation of PBL can increase student's conceptual understanding and the effective ways to implement PBL in order to increase student's conceptual understanding. This research is a Classroom Action Research, and this was a two cycle research where the research used student's written test, student's questionnaire, student's interview, teacher's interview, teacher's observation form, and journal reflection as instruments to measure student's conceptual understanding and the implementation of PBL based on the Christian perspective. Based on the analysis and discussion, it can be concluded that the implementation of problem-based learning could increase students' conceptual understanding based on the Christian perspective.

Keywords: *Problem-based Learning (PBL), conceptual understanding, Christian perspective.*



INTRODUCTION

Education is the most important aspect in human life. Without education, human will not be able to survive and grow until their state of life today. When nuclear bomb hit Japan, the first thing that they did were rescuing teacher because they know that to build one big nation, the first thing to build was their education and its system. Because, to build a great nation, we need great people and society, and to build great people and society, people need to learn how to become one holistic person, and the only way to learn how to become a holistic person is through education since education can lead to the changes of behavior. These changes of behavior involve the change of knowledge (cognitive) and skills (psychomotor) and also involve values and attitudes (affective) (Siregar & Nara, 2010, p. 3). As Romans 12:2 tells us: "And be not conformed to this world, but be ye transformed by the renewing of your mind, that ye may prove what is that good, and acceptable, and perfect, will of God." (KJV).

From the passage we all know that changes of behavior that involve the change of knowledge, skills, and attitudes or in its word, renewing of your mind, is a demand from God. The goal of Christian education itself is to guide the students to become the disciple of Jesus Christ that is responsible so they will be able to apply Christian values in their life (Van Brummelen, 1998, p. 19). That is why a big changes of students cognitive, psychomotor and also affective must be based also on Christian values that emphasize on God's preeminence in their life so through the education that they took, they can learn how to become a holistic person, not just a holistic person but a holistic Christian person. Students need the help of their teachers to achieve this goal, not just ordinary teachers but what they need are Christian teachers. These Christian teachers have to be able to do their teaching activity based on the Christian philosophy. Now their job in hand is to try to develop a Christian approach on philosophy and also education (Knight G. R., 2006, p. 198). Because of that, in a teaching, a strong and solid cornerstone is needed in teaching the students so they can have a strong cornerstone with God in their life.

But, the falling of mankind to sin made everything become harder than before, full of constraints, and many mistakes. This disequilibrium makes all of the students did not get what they supposed to get through education. They just learn to pass the standard grade and move on to the next grade. Students forgot all the things that they have learned from elementary school to high school since what they teacher did for students is just spoon-feeding. This is a big mistake in the education nowadays. Students don't have the basic ability



The Implementation of Problem-Based Learning to Increase Students' Conceptual Understanding According to Christian Perspective

that is strong and solid in every type of learning so they will be able to solve every problem that they faced by their own ability. This is the things that the students lacked very much, especially in mathematics.

The researcher also found this phenomenon when the researcher was doing an observation in certain school. From the observation, the teachers just gave explanation for students. After that, teachers just gave less difficult problems for students to solve or the problems in their textbook. But if they were given slightly different problems from the usual problems that they had practiced, students were not able to solve it. They were not able to identify the problems and analyze the concept that was needed to solve those problems. This thing is the result of the lack of conceptual understanding which led to the inability of students to develop their skills and ability to interpret a problem, find a way to solve the problem, and solve a slightly different problem that still related to the problems that they have learned before even they have solved before. That is why, the researcher expected that the application of Problem-Based Learning (PBL) can give a solution to overcome this problem.

LITERATURE REVIEW

In this chapter, the researcher will discuss the theoretical bases used in this research and the Christian perspective of each variable. As part of knowledge and truth, this knowledge should bring men to an acknowledgement that they need God's revelation in order to know and relate with Him (Jensen, 2002).

1. Problem-based Learning

Knight (2006) in his book, *Philosophy & Education* explained that Jesus Christ use two formats of teaching which are parables and teaching through objects (p. 304). Parable itself has advantages and strengths compared to the other which is the parable that Jesus used was taken from real-life experience or real-life problems of the Jews those days. Some of the examples are; Theparable of the Sower (Matthew 13:1-30), The Parable of the Bags of Gold (Matthew 25:14-20), and A Lamp on a Stand (Luke 8:16-18). From the parables that we often heard and read, these parables are really relevant with the life of the Jews on that age, but not really relevant with the life of people these days. But the thing that we took is not how things can be contextually relevant, but how those things can be essentially relevant to our life and can be used in our life. Van Brummelen also stated that the criteria of a successful Christian curriculum is to help students develop their abilities to take parts in society,



including thinking through different perspectives and interpretation (Van Brummelen, 1998, p. 45). This concept of curriculum is more less similar with the purpose of Problem-based learning. These things were related with the application of Problem-based learning which use the things in real-life to understand the concepts of a subject and material.

Trianto (2009, p. 90) emphasizes Problem-based Learning as a learning method that based on many problems so it needs more authentic research, which is a research that need a real solution from a real problem. This statements is also supported by Oon-Seng Tan (2009, p. 19) which explain that Problem-based Learning is a method that prepare an individual to face the always-changing society and has high level of knowledge. From the definition, the researcher conclude that Problem-based Learning is a learning method that use problem as a tool to learn and through further investigation, students can form their own knowledge from the problem so that the students not only can improve their problem-solving skill but they are still able to understand and master the content and also the concept of the knowledge. Problem-based learning can help students to be able to analyze the problem that they faced using the knowledge that they had learned during learning process and solve the problems, with that, they will become a lifelong learners and the knowledge that they had learned will not be wasted. Based on Tan and Pierce and Jones's explanation about the characteristic of problem-based learning, the researcher concludes that there are some characteristic in applying the Problem-based learning which are: (1) The focus of the learning is problem, (2) the problem come from real-world situation, (3) students become self-directed learners, (4) there are small groups of students that enable students to work individually or collectively, (5) develop the problem solving skills and higher order of thinking (6) There are closure and explanation about the research and observation.

Based on the theories from (Cheong & Goh, 2002, p. 31) and Ibrahim and Nur (2005, p. 212) about steps of problem-based learning, the researcher concludes that there are 5 steps of Problem-based Learning that will be used in this research as the indicator of Problem-based Learning, those indicators are:

1. State the problem to students.

In this stage, based on the explanation above, the teacher will explain the learning objective and motivates students in order to stimulate the student.

2. Give student chance to analyze the problem.

In this stage, the teachers will give problems to students to analyze in order to organize students to learn.



The Implementation of Problem-Based Learning to Increase Students' Conceptual Understanding According to Christian Perspective

3. Guide the students by giving motivation, help, and reward.

In this stage, the teacher will give chance to students to do investigation and during their discussion, teacher will give them motivation, help, and also reward.

4. Student present the conclusion in term of concept.

In this stage, the teacher will give chance students to present their own opinion about the concepts of the material.

5. Evaluate the concept that is given by students.

In this stage, the teacher will draw conclusion from the problem solving and in order to clarify gaps and mistakes during students' presentation.

2. Conceptual Understanding

One of the parables that Jesus taught to his followers is about The Wise and Foolish Builders (Matthew 7:24-27, Luke 6:47-49). In Indonesian, this parable was translated as two type of foundation. This parable clearly showed that in man's life, he has to have firm, strong, and true foundation in his faith. But the meaning here is not only has the firm, strong and true foundation in faith, but also in every aspects of his life. How people can understand and know on how to choose the right foundation in his life if he does not know what kind of foundation that he can use and apply in his life. So it is important for people to understand the basis of his life so they can know how to apply it. This concept can also be used in mathematics, if we do not know about the concepts of materials, and we choose the wrong one, how we can stand firm and survive the ordeal? We will fail to answer the questions and be like the foolish builder.

Conceptual understanding is also related with the cognitive process in our mind. When talking about Christianity, we have to use our mind in every aspect, not only in thinking process, but also in loving God, Bible said in Mark 12:30 is to love God with all your heart, soul, mind, and strength, that is the first commandment. Barclay (1993, p. 12) stated that Christian mind is not only talking about having great and massive intellectual but also how those wisdom and intellectual can renewed our life through our daily practical activity. This is what God wants from us, which is to have the knowledge and able to apply the knowledge in our daily basis. This also similar with the meaning and core essence of conceptual understanding.

Conceptual understanding is a key aspect of learning (Santrock, 2011, p. 295). Having a great conceptual understanding help us to know the meaning



and purpose of one definition and we can know the true definition of things. According to Oxford Advanced Learner's Dictionary, understanding is the knowledge that somebody has about particular subject or situation. Indonesian General Dictionary (*Kamus Umum Bahasa Indonesia*) define understanding as process, method, the act of understand, ability to use (knowledge, wisdom, etc.). Furthermore, Djamarah also stated that understanding is the ability to use and apply the knowledge that they have (2008, p. 32). With the definition above, the researcher then concludes that conceptual understanding is the ability to use and apply the basic knowledge that construct the knowledge itself based on its proper function.

Based on the researcher's definition about conceptual understanding which is the ability to apply the knowledge. This ability is also the goal of education which is stated by Bloom who differentiated the goal of education into three parts or domains which are cognitive, affective, and psychomotor. The cognitive goals of education are divided into six main parts which are (Nasution, 2008, pp. 24-26): (1) Knowledge (Know), (2) Comprehension (Define), (3) Application (Apply), (4) Analysis (Analyze), (5) Evaluation (Evaluate), (6) Invention (Create).

As we can see from the Bloom's taxonomy, there is a progress from the first step to the next step and we can also see that application or ability to apply is on the third step. It means that before reaching the third step, students must be able to pass the first step and the second step which are knowledge (know) and comprehension (define).

Knowledge is related with the information and facts to be memorized and remembered by students. Students have the ability to recall the knowledge that they have learned. Comprehension means that the students understand the information and can explain it in their own words (Santrock, 2011, p. 404). Comprehension can also means the ability to state and describe a definition, formula, difficult words in their own words or can also be the ability to interpret a theory or looking through the consequences or implication, predict the probability or effect of something (Nasution, 2008, p. 26). Application means that the students use knowledge to solve real-life problems. For example, an objective might be to apply what has been learned about using a computer for word processing to how this could be used in various careers (Santrock, 2011, p. 405). In the application process, students are demanded to be able to use the general ideas, methods, principles, and theories in new situation using the approach of problem solving (Daryanto, 2008, p. 109). By surpassing this step of



The Implementation of Problem-Based Learning to Increase Students' Conceptual Understanding According to Christian Perspective

cognitive goals, students are expected to be able to solve new problems using ideas and theories that they have learned before.

From the definition above and the explanation about Bloom's taxonomy and each steps, the researcher can define the indicator of conceptual understanding that will be used in this research especially related to the material of probability in high school.

The indicators are:

1. Student can recall the concepts.

Based on Bloom's Taxonomy first order of thinking which is the ability to know and recall the concepts.

2. Student can describe the characteristic of the concepts

Based on Bloom's Taxonomy second order of thinking, this stage need student ability to looking through certain facts more deeply and enable them to re-describe things with their own words.

3. Student can solve problems related to the concepts.

Based on Bloom's Taxonomy third order of thinking, students were demanded to use the approach of problem solving.

This research was conducted on September 8 – 29, 2015 at a private Christian School Grade XI Social Studies at SMA X in Palopo. The subject of this research is the students on grade XI from the social science class. There are 16 members of the class, consist of 6 boys and 10 girls. The XI Social Class is one of the least students in a class. During the first cycle, one student was absent and in the next cycle another student was absent. That's why there are two students who were omitted from the research. For the purpose of data analysis, the researcher decided to took 14 data from the students.

ANALYSIS AND DISCUSSION

This research is a Classroom Action Research (CAR) that emerge as the result of researcher's perturbation with the phenomena that happened during the teaching and learning activity inside the classroom which showed that the students are lack of conceptual understanding that is resulting on ineffectiveness of teaching and learning activity inside the classroom that effect on students' learning result.

Mulyasa (2009, p. 11) states that Classroom Action Research is an effort to pay close attention to students' learning activity by giving an intentional



action with purpose to repair and improve the quality of learning inside the classroom. There are several models of classroom action research, but the research decided to do this Classroom Action Research by using Kemmis & McTaggart model of Classroom Action Research that consist of four stages, which are: (1) Planning, (2) Action, (3) Observing, and (4) Reflecting. These four stages are a series of activity that form a cycle which means after finishing the last stage, the research proceeds to the first stage again, until the researcher finds that it is enough cycle for the research, then the research is finished. Based on the researcher's explanation about classroom action research, the researcher decided to make three stages in this research which are pre-cycle, first cycle, and second cycle.

To evaluate each of the variable, the researcher collected the data using two type of methods used to evaluate in this research, they are non-test and also test methods (Arikunto, 1999, p. 26). From several instruments of non-test method that was introduced to the researcher, there are three techniques of non-test that were used in this research which are questionnaire, interview, observation, and reflective journal. For the test method, the researcher wolud give written test method.

Based on the Wiriaatmadja's (Wiriaatmadja, 2009, pp. 66-67) explanation on Kemmis & McTaggart's model of classroom action research, there are some detail explanations about each stage:

1. Planning started with reconnaissance which means that the researcher recognizes there is something wrong in the classroom that affect teaching and learning process and affect teacher and students as the subjects in the activity. From reconnaissance, the researcher decided to figure out the best solution that can be done to overcome the problem. The researcher also has to know the characteristic of the students and also the condition of the school to find the best solution possible.
2. Action is the act of implementing the plan that has been prepared before and implementing the solution that had been prepared thoroughly by the researcher.
3. Observation is the process of collecting the data using the instruments that had been prepared in the planning stage and had been executed in the action stage.
4. Reflect is the stage where the researcher evaluates everything that had been done in previous stages. What are the strengths and weaknesses of the implemented solution and what are the things that need to be fixed in the next cycle, should the researcher ended the research in this



The Implementation of Problem-Based Learning to Increase Students' Conceptual Understanding According to Christian Perspective

cycle or should the researcher proceed to the next cycle to find more valid and reliable result.

As a Christian teacher, classroom action research is a good way to reflect his teaching activity. Van Brummelen (1998, p. 47) in his book *Walking with God in the Classroom* said that as a Christian teacher, we have to teach responsively and responsibly. Responsively means that we have to know what are the problems inside the classroom and we have to be responsive to find the way to overcome those problems. Not only that, a responsive attitude will lead to a deeper understanding about our students so we can know what are the things that struggling and how each student thinks and feel when they are in the classroom. Responsibly means that everything that a teacher does in his class is his responsible. Those students are God's image who was given to teacher (Van Brummelen, 1998, p. 51). The teacher has to lead and redeem them to the truth, the truth of our Lord Jesus Christ. It means that we are responsible to God about all things that we have done in the classroom. It is hard to be a teacher and the Bible also agree with that, as James 3:1 said: My brethren, be not many masters, knowing that we shall receive the greater condemnation. (KJV)

To teach responsively and responsibly, it is important to know what are the problems, how we can overcome them, and reflect on what we have done inside the classroom. Know our strengths and weaknesses is important so we will become a true Christian Teacher.

In this research, the data will be presented in the form of qualitative data. Some instruments will be analyzed using simple descriptive statistic because data was in form of quantitative data. The quantitative data came from students' written test, student's questionnaire, and teacher's observation form. The rest of the instrument produce qualitative data. For students' written test the research will use school's standard of grading system which is 70. If the score is above seventy (>70) will be count as pass and if the score is below seventy (<70) will be count as failed. The written test will also be analyzed based on each dimension, which are C1, C2, and C3. By analyzing each dimension, it will help the researcher to analyze the achievements of students by each dimension. In analyzing the questionnaire, which is Guttman Scale, the questionnaire will be analyzed using the analysis by Arikunto on how to analysis the data of questionnaire with two choices, yes or no. The teacher's classroom observation will be analyzed using the method introduced by Arikunto on how to analysis the data of observation form with four choices, (1, 2, 3, and 4). With



the statement by Tampubolon (2014, p. 55), the researcher would use the score of 61% for the minimal score and good criteria for each indicator or score that was resulted by each instrument. If the scores already exceed the number, the researcher would stop the research and take conclusion based on the result.

1. Conceptual Understanding

Based on the result of the pre-cycle, first cycle, and second cycle, the researcher will do an overall analysis to measure whether the students' conceptual understand were increasing and the implementation of problem-based learning can increase students' conceptual understanding in learning probability. From the researcher's observation on each of the instruments and also on the researcher's journal reflection on the teaching and learning activities, the cycle was done really good and the researcher also got good result and good feedback from each instruments. The written test shows that students' conceptual understanding was increased compared to the pre-cycle stage. Even though in the cycle 1, students' ability to apply the material were still low but there is significant progress on their ability of each one of the students, which indicates the increasing of their conceptual understanding. If we compared it with the pre-cycle phase, the increase rate was almost 100%, which showed that there was an increasing in students' conceptual understanding since all of the indicator were increasing. From the result of the analysis of the test, the researcher conclude that students' conceptual understanding were increasing. The increasing of conceptual understanding was also shown in the students' questionnaire which showed a good opinion on students' own conceptual understanding. From the result of the analysis of the questionnaire, the researcher conclude that students' conceptual understanding were increasing. The students' interview also gave the opinion about their conceptual understanding which in overall statement the students agreed that their ability to apply the material were better than before although they still had to deal with such difficulties and hard problems which they were struggling with. This showed how the students were likely to work hard and try to understand and do their best. Their opinion were confirmed by mentor teacher's observation on their conceptual understanding as we can see from the result of the observation form where the indicator rate of the conceptual understanding were 70% which showed that students' shown good ability to apply the concept of the material which also showed that students' conceptual understanding are good.



The Implementation of Problem-Based Learning to Increase Students' Conceptual Understanding According to Christian Perspective

From the result of students' written test, students' questionnaire, students' interview, and also teacher's observation form which showed positive result and increasing of students' conceptual understanding, the researcher concluded that students' conceptual understanding were increased after the implementation of problem-based learning in the teaching and learning process.

In the second cycle, the researcher will start to analyze the conceptual understanding based on the result of the students' written test. As can be seen in the graph, the overall result of the students who passed the test were increasing. In the first cycle there were ten students who passed the test and in the second cycle there were only one students who did not pass the test which means that there were 14 students who passed the test. From the result of the written test in detail, it can be seen that there were some students who showed significant improvements with their written test. There were also some students who got perfect score. Compared to the first cycle, most of the students' score were increasing. It can also be seen from the average score of the test which was increasing as many as 11.8 from 66.2 to 78.0. The average score itself had surpassed the standard score set by the school which was only 70.0. Although there were two students who showed negative differences in their result.

From the result of the written test, it could be seen that students' ability to apply the concepts of the material were increasing. The success rate of students' written test was also increasing as many as 28.7% from 58.8% to 87.5%. From the result and analysis on the pre-cycle, first cycle, and also second cycle, the researcher got that the average score of each indicator was increasing especially in their ability to apply the concept which will be shown in the diagram below:

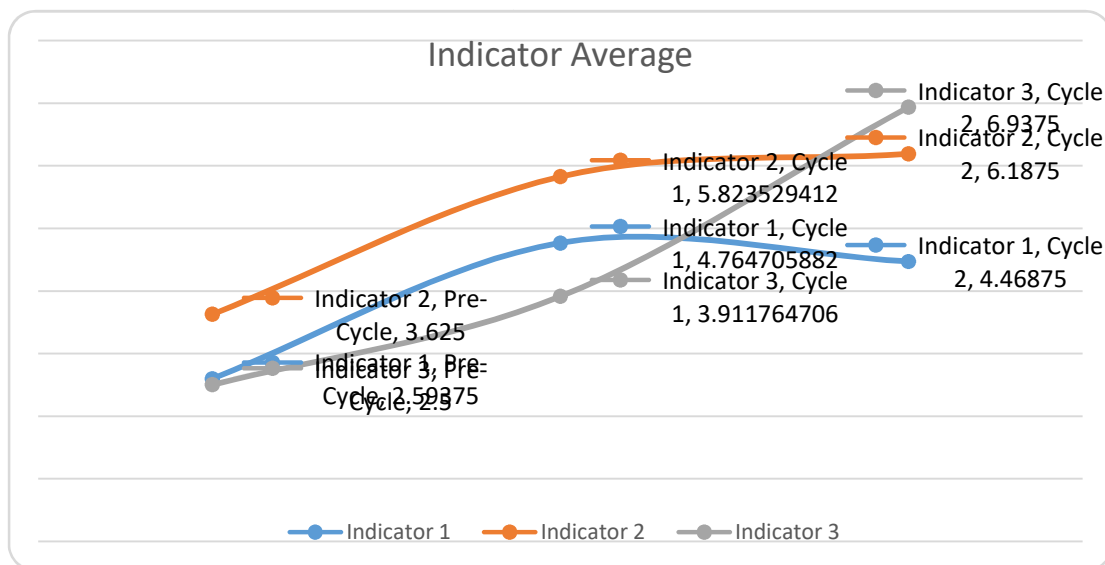


Figure 1. Diagram of Cycle Indicator Average

As the researcher saw, the average score of each indicator was increasing. But not only the average score, the success percentage of each indicator was also increasing which can be found in the following diagram:

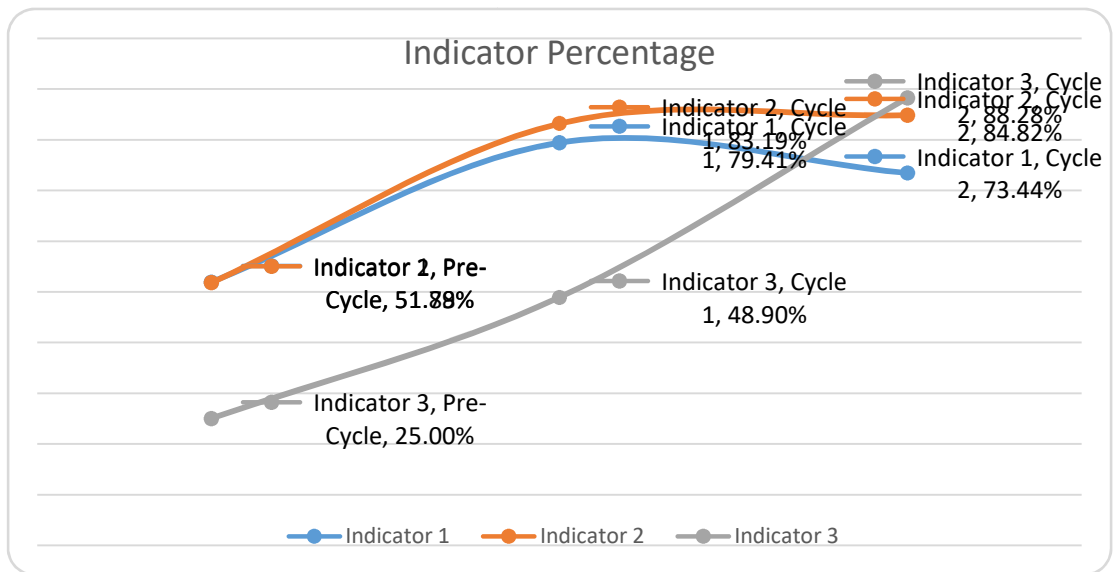


Figure 2. Diagram of Cycle Indicator Percentage

Similar to the indicator average, the indicator percentage was also increasing compared to the pre-cycle where there was no implementation of problem-based learning. The researcher will also take a look on the average score and the passes percentage of the quiz to show the progress of students' score which will be shown in the following diagram:

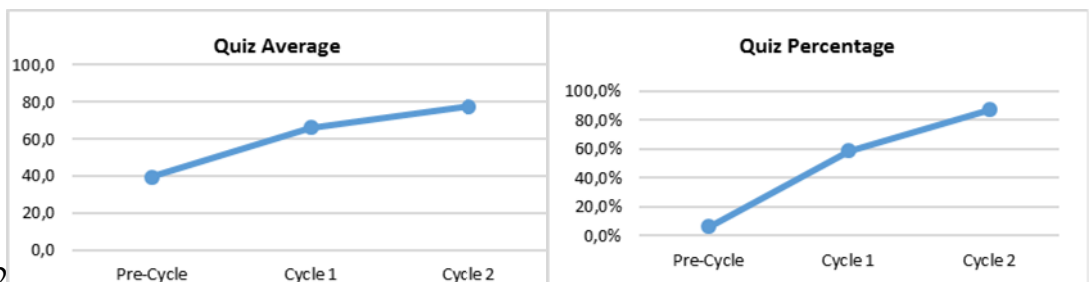


Figure 3. Diagram of Quiz Average and Percentage



The Implementation of Problem-Based Learning to Increase Students' Conceptual Understanding According to Christian Perspective

From this result the researcher could say that students' conceptual understanding was increasing.

The result of the questionnaire was related and correlated with the result of students' written test where it showed big leap in its ability to apply the concept of the material. When the researcher took a look on the result of students' interview, especially in the third indicator, the students said that they were not sure with their own ability to analyze the problems and identify the concept in certain problems. They said that they need more time to think. It was related to students' confidence about the result of the test. The researcher could see it in the result of the seventh statement. The result percentage might be increasing but the number still far below 50% which was only 33%. This result showed that although the researcher could say that students' conceptual understanding was increasing, their own confident to get good grades were still low. When the researcher calculate the average of the percentage, it can be seen that the average were increasing from the first cycle which was only 60%, the average in the first cycle was 65% which can also supported and showed that students' conceptual understanding were increasing. From the result of the teacher's observation form showed that students' conceptual understanding was 70%. This number showed good number but there were no differences between the first cycle and second cycle which showed that it was stagnant.

So, from the result of the researcher analysis of each of the instruments and also the discussion about some of the phenomena that can be observed on each of the instrument, the researcher concluded that students' conceptual understanding were increasing but not by a large margin since there were some things that hold back the students, not by their own cognitive capabilities.

2. Problem-based Learning

As the effectiveness of the implementation of problem-based learning, the students' questionnaire showed good numbers that indicates that students were interested, challenged, and excited with the implementation of conceptual understanding which effect their own conceptual understanding. One thing that the researcher still lacked was the last part which is concluding the concept of the material from problem-solving. Students were also struggling to conclude the concept of the material, based on the result of the



questionnaire. The mentor teacher also gave the same opinion, where the researcher already used the problem-based learning effectively but at the end of the investigation and discussion the researcher still had not state the conclusion clearly. This thing happened because the researcher did not do really good in his time management which affect that in the last part, the researcher wasn't able to conclude the concept of the material clearly. From the researcher reflection on his journal reflection and also when reflection stage of this research, the researcher said that there are some things that need to be improved for the next cycle which are the implementation of the lesson plan has to be on point, the problems need to be more contextual, and the researcher needed to be more engaged with students by giving motivation, praise, and also reward.

For the result of the effectiveness of the implementation of problem-based learning, the researcher will compare the implementation on the first cycle and also the second cycle. From the comparison above it can be seen that the percentage of all of the statements and also the indicators were increased compared to the first cycle. The first indicator was increasing. The second indicator was also increasing its percentage. As for the third and fourth indicator which was in the tenth and eleventh statements did not show any progress but the number were still good. As for the last indicator of problem-based learning, the result was also not changing. This number were supported by teacher's interview result where the teacher also said that the researcher was still lacked in the last step which was to conclude and gave conclusion on students' discussion. The researcher journal reflection and also based on the reflecting part during the research, the research also reflected on that part of the method. As from the teacher's observation form, the researcher compared the result with the first cycle and it showed that the result was decreasing. The only point that was deducted from the result was in the first part where the researcher was addressing learning objectives and also gave motivation for students to engaged in the teaching and learning process. This was also related with the result of the teacher's interview where mentor teacher said that the researcher still did not motivate the students well enough. That's why the number in this part were increasing. But when the researcher took a look at the average of the result of observation form, the percentage were increasing which can support that the researcher had implement the problem-based learning effectively to increase students' conceptual understanding.

The key for the students to be able to master the conceptual understanding is by giving more time for them to practice. The mentor teacher



The Implementation of Problem-Based Learning to Increase Students' Conceptual Understanding According to Christian Perspective

was also said this in the interview session and the students also said that if they need more time they were able to do better, this was based on the students' interview. Based on the lesson plan that was made by the researcher, there were a lot of time for them to practice, but as the researcher took further analysis on the implementation of the lesson plan and the problems given by the researcher, the researcher gave too many problems which implemented one concept and not both concepts. Since both concepts were similar, the researcher should have given problems which as the integration of both concepts to help the students differentiate each of the characteristic of the concepts. This opinion was also supported by the result of the questionnaire in the section to measure the implementation of problem-based learning. Most of the students were disagree when they were asked whether they were able to draw a conclusion of the concepts of the material, since after learning both of the material they were struggling to differentiate both concepts since they were similar one to another. Slavin (2006, p. 240) also said that there will be a decrease in ability to learn new things because of the knowledge that they had learned before. This was resulted in the students' questionnaire where there were only 33.3% of the students who thought they were able to draw the conclusion. That's why the implementation of problem-based learning was disrupted in the last part of concluding the concepts of the material because of the problems who didn't covered all of the concepts of the material since the material were similar. Tan (Tan, Problem-based Learning Innovation, 2003, p. 30) also emphasize that the closure is important in order to synthesis and integrate the concepts of things that they had learned to make in one big story and later to draw the conclusion on each of the concepts. Based on the researcher analysis and discussion in this first cycle it can be seen that the implementation of problem-based learning can affect the conceptual understanding and by this research it can be seen that students' conceptual understanding was increasing compared to the last result. To check whether the implementation of problem-based learning will increase students' conceptual understanding and to implement problem-based learning better to achieve the effective way to implement it.

So, from the result and the researcher's analysis and discussion on both of the variable measured, the researcher concluded that the researcher had used the effective way of problem-based learning which also had affected students' conceptual understanding to be increasing. To make sure that the phenomena were not only because of an accident or another factors, the



researcher would continue onto the new cycle to make sure that the problem-based learning could increase students' conceptual understanding.

CONCLUSION AND RECOMMENDATION

From this research, the researcher concludes that the implementation of problem-based learning in teaching and learning process can increase students' conceptual understanding. Students also thought that their conceptual understanding were increasing after the implementation of the treatment which is problem-based learning. As for the effectiveness of the implementation of problem-based learning, there are some steps that can be used to implement the problem-based learning which are:

1. State the problem to students
2. Give student chance to analyze the problem
3. Guide the students by giving motivation, help, and reward
4. Give chance to students to present the conclusion in term of concept
5. Evaluate the concept that is given by students.

These steps are the steps of problem-based learning which are the effective way of teaching probability which also can increase students' conceptual understanding in learning probability. This is also the main job as a Christian teacher which is to help students think through different perspectives and interpretation by analyzing problems surround him to help them grasp the core meaning of knowledge and the main purpose which is to glorify Thy name through redeeming every sector of life the students involved in and bring it back to Christ and by their presence the world will see and also will glorify the Lord. The problem-based learning really helped the students to understand the material because problem-based learning used contextual problems to identify the concept of probability. As the Bible said that we can't be conformed to this world but be transformed by the renewing of our mind which consist of our cognitive, affective, and also psychomotor. Based on the analysis and discussion and the researcher's reflection on each of the cycle, there are some recommendation from the researcher for another researcher who is interested to do similar research which are:

1. The researcher need to pay more attention on the lesson plan since the implementation of problem-based learning need more time. In order to accomplished all of the steps of the problem-based learning, the time must be allocated clearly and must be done firmly because it will affect the other steps of problem-based learning.



The Implementation of Problem-Based Learning to Increase Students' Conceptual Understanding According to Christian Perspective

2. In teaching, the teacher must be able to get students' attention in the early minutes of the teaching and learning process. This will help build the environment and atmosphere inside the classroom so when the teacher implements the problem-based learning and has to do bigger discussion, the students will be interested to do the investigation in groups. To engage with the students, the researcher has to give more words of motivation, praise, and reward.
3. In order to make the students interested with the problems and they have will to discuss and do the investigation, use the problems that are related with students' life. It means that the researcher must take more time in preparation in order to know students' life and things in their life that makes them interested to think.

REFERENCES

- Arikunto, S. (1999). *Dasar-dasar Evaluasi Pendidikan*. Bumi Aksara: Jakarta.
- Barclay, O. R. (1993). *Akal Budi Kristiani*. Jakarta: Gandum Mas.
- Barrows, H., & Tamblyn, R. (1980). *Problem-based Learning: An Approach to Medical Education*. New York: Springer Publishing Company.
- Cheong, A., & Goh, C. (2002). *Teachers' Handbook on Teaching Generic Thinking Skills*. Singapore: Prentice Hall.
- Daryanto, H. (2008). *Evaluasi Pendidikan*. Jakarta: PT. Rineka Cipta.
- Djamarah, S. B. (2008). *Psikologi belajar (2nd ed.)*. Jakarta: Rineka Cipta.
- Duch, B., Groh, S., & Allen, D. (2001). *The Power of Problem-based Learning*. Virginia: Stylus Publishing.
- E. Mulyasa. (2009). *Praktik Penelitian Tindakan Kelas*. Bandung: Remaja Rosdakarya.
- Ibrahim, M., & Nur, M. (2005). *Pengajaran Berdasarkan Masalah*. Surabaya: Universitas Press.
- Jensen, P. (2002). *The Revelation of God: Contours of Christian Theology*. Illinois: InterVarsity Press.
- Knight, G. (2006). *Philosophy & Education*. Michigan: Andrews University Press.
- Knight, G. R. (2006). *Philosophy & Education - An Introduction in Christian Perspective*. Michigan: Andrews University Press.
- Levin, B. (2001). *Energizing Teacher Education and Professional Development with Problem-based Learning*. Danvers: Association for Supervision and Curriculum Development.
- Nasution, S. (2008). *Teknologi Pendidikan*. Jakarta: Bumi Aksara.



- Pierce, J. W., & Jones, B. F. (1996). *Problem Based Learning: Learning and Teaching in the Context of Problems*. Denver: Northern Illinois University Press.
- Quinn, P. (2009). *Early category and concept development*. New York: Oxford University Press.
- Santrock, J. (2011). *Educational Psychology*. New York: McGraw-Hill.
- Savin-Baden, M., & Major, C. H. (2004). *Foundations of Problem-based Learning*. London: Open University Press.
- Siregar, E., & Nara, H. (2010). *Teori Belajar dan Pembelajaran*. Jakarta: Ghalia Indonesia.
- Slavin, R. (2006). *Educational Psychology: Theory and Practice Eighth Edition*. United States of America: America.
- Tampubolon, S. (2014). *Penelitian Tindakan Kelas: Sebagai Pengembangan Profesi Pendidik dan Keilmuan*. Jakarta: Erlangga.
- Tan, O.-S. (2003). *Problem-based Learning Innovation*. Singapore: Thomson Learning.
- Tan, O.-S. (2009). *Problem-based Learning and Creativity*. Singapore: Cengage Learning Asia.
- Trianto. (2009). *Mendesain model pembelajaran inovatif-progresif: Konsep, landasan, dan implementasinya pada Kurikulum Tingkat Satuan Pendidikan (KTSP)*. Jakarta: Kencana.
- Van Brummelen, H. (1998). *Walking with God in the Classroom*. Seattle: Alta Vista College.
- Wiriaatmadja, R. (2009). *Metode Penelitian Tindakan Kelas*. Bandung: Rosdakarya.

