

CHAPTER I

INTRODUCTION

1.1 Background of the Research

The visions of Christian education are to help and to guide the students become a responsible disciple of Jesus Christ (Van Brummelen, 1998). A disciple needs to follow the instructor by grasping and applying his vision in their everyday lives. It means that the Christian education leads the students to be responsible disciples of Jesus Christ by understanding and committing themselves to Christ and Christ's vision of God's Kingdom. As the disciple, the students need to learn and practice God's will in their personal lives and in their societal callings. The societal callings, furthermore, involve a willingness to build Christian relationship in the community.

The Christian education cannot be separated from the role of the home, the church, and the school. This ideally forms an educational "tripod standing firm on the base of God's Word and the flame of Christ's Spirit" (Van Brummelen, 1998, p. 6). Those institutions altogether develop the learners' potential in all aspects of their life, include physics, spiritual, and character. Van Brummelen (1998) also explained that schools should have a Christian curriculum orientation in three Biblical injunctions, which are creation mandate, Great commandment and Great Commission. Those shaped the curriculum into three main aspects, they are intellectual and cognitive content; skills and abilities; problem-solving and creative experience. The intellectual and cognitive content are rooted in the Creation Mandate to take care of the world.

The Christian school builds a perspective to see the students as image of God (Knight, 2006). It means that students have love and a rational being because it is a part of God's characteristics. The Christian teachers play a role as an agent of reconciliation. Their task is to "seek and to save that which is lost" by building shalom community in the classroom and by helping the students to find their needs and guide them to the proper way (Proverb 22: 6). Van Brummelen (1998) and Knight (2006) agreed that the teaching methodologies or the pedagogy play an important role to restore God's image thus, it have to be planned well.

Knight (2006, p. 236) explains the main point that the teacher needs to know is "the teaching of any topic in a Christian school is not a modification of the approach used in non-Christian schools. It is more rather a radical reorientation of that topic within the philosophical framework of Christianity". Thus, finding the correlation or the integration between the Christian concepts and the subject matter in the various field of study is important. Mathematics does not only construct the mind but also bring out a sense of awe and wonder in the design and the order of God's creation (Van Brummelen, 2002). The Christian mathematics teacher needs to develop this value so that the students have a deeper understanding of God's creation and how that understanding helps them to fulfill their calling. By this understanding, Van Brummelen (2002) formulated some goals of learning math, include gaining understandings of the concepts of mathematics matters and how to apply them in a certain situation. The students should know that mathematics' problem could be solved in a creative way.

Unfortunately, the researcher found that grade 8C students at SMPK X Manado were struggling in understanding the concepts, especially in function

topic. It showed from their questions that they used to ask and their work. They had difficulty in finding the value of function expanding problem, function-form. Moreover, the researcher spent two meetings in teaching the students about the function value that which included a function-form problem. The students' mean score for the test is 47.80 and only 30% (7/25) of the students can pass KKM (see Appendix E-2). The mentor teacher also said that the students had difficulty in determining the value of a function with two variables (see Appendix E-5). The researcher realized that the learning method which she used tended to monotonous. She used interactive lecturing and gave some exercises for the students to be done individually. Thus, the learning environment did not support the students to develop their conceptual understanding in learning function.

Since the main task of the teacher is to be the agent of reconciliation, thus, the researcher intended to help them to develop their need for understanding the mathematics concepts and apply it to the variety ways. To achieve this goal, the researcher has to select the teaching methodologies and plan the pedagogy to restore God's image so that the students could be the responsible disciples of Jesus Christ. Quantum Teaching is a model which has founded by Bobbi DePorter. This model is the further design of Super-Camp that particularly implemented in the classroom and could be used by the teachers. DePorter designed a learning camp for teenagers called Super-Camp in 1982 after studying accelerated learning with a Bulgarian researcher (Quantum Learning Education, 2015). This camp became popular and gained successes to increase the learner performance. DePorter (1999) presented the results of Super-Camp such as 68% increase motivation, 73% improve grades, 81% develop more confidence, 84%

increase self-esteem, and 98% continue to use skills. Super-Camp derived Quantum Learning, the learning model for the learner that consisted of many strategies to maximize their potential. Since 1992, Quantum Learning adjusted to the relevant learning framework in the classroom thus it offered worldwide, known as Quantum Teaching.

The main purpose of the Quantum Teaching is to maximize the students' potential. The students' potential is regard to the students' whole life such as cognitive, skills and character. Quantum Teaching also focuses on dynamic interaction within the classroom to enhance the quality of the learning process (DePorter, 1999). It involves the learning skills by providing strategies to learn effectively and builds the students' self-concepts or self-confidence by providing reinforcement due to their successes. Based on the explanation above, it is clear that Quantum Teaching could improve the students' conceptual understanding by enhancing the quality of the learning process.

Moreover, there are some researchers who have been studying and proving the influence of Quantum Teaching toward students' conceptual understanding. Murzinal (2012), in UNP's journals, had a research on the students' understanding of mathematical concepts by using quasi-experiments as his methodologies. He implemented conventional learning in the control class and Quantum Teaching in the experiment class. The result was the students who learned in experiment class had a better understanding of mathematical concepts rather than in control class. In the other research, Nursyfa (2014) implemented Quantum Teaching in primary school for increasing students' understanding of mathematical concepts. She used Classroom Action Research as her research methodology with two cycles. She

found that the students had increased their conceptual understanding after she applied Quantum Teaching method in her classroom. Those studies showed the influences of the implementation of Quantum Teaching in increasing students' conceptual understanding, especially in the mathematics subject.

Recognizing the needs of students and the influences of Quantum Teaching in increasing students' conceptual understanding, then the researcher intended to increase the students' conceptual understanding by implementing Quantum Teaching as the framework of this research. The researcher was given an opportunity to teach the students grade 8C in learning function. Therefore, this research focuses on the implementation of Quantum Teaching to increase the students' conceptual understanding in learning function at SMPK X Manado.

1.2 Research Questions

The research questions for this study are as follows:

- 1) Does the implementation of Quantum Teaching increase students' conceptual understanding in learning Function at SMPK X Manado?
- 2) How does Quantum Teaching increase students' conceptual understanding in learning Function at SMPK X Manado?

1.3 The Purpose of The Study

Based on the research questions above, then the purposes of this study are:

- 1) To know whether Quantum Teaching increases students' conceptual understanding in learning Function at SMPK X Manado

- 2) To analyze the implementation of Quantum Teaching in students' conceptual understanding in learning Function at SMPK X Manado.

1.4 Benefits of The Study

As for the benefits of this study as follows:

1.4.1 For Researcher

- 1) This research helps the researcher to understand the important role of Christian teacher that is to help the students learning process well by implementing pedagogies that not only meet the learning objectives but also to response the God's plan for each student's life.
- 2) The researcher can improve the analytical and reflective skills and get the strength and weakness of the Quantum Teaching's implementation.
- 3) This experience in conducting this research could equip the researcher to take part in further research.

1.4.2 For Teachers

The teachers will be able to use the teaching methodologies being used by the researcher to improve the students' conceptual understanding. Moreover, this research can be used as an input and consideration for the teacher in implementing the fun learning process to enhance the students' conceptual understanding.

1.4.3 For the School

This research enriches the teaching methodologies or pedagogy of teaching and learning process by implementing Quantum Teaching at the school.

1.5 Definition of Terms

1.5.1 Quantum Teaching

Quantum Teaching could be defined as “the orchestration of the variety of interactions that exist in and around the moment of learning to maximize the students’ potential” (DePorter, 1999, p. 5). Quantum Teaching model has the Design Frame components called as EEL Dr. C. It was the acronym of each phase of Quantum Teaching i.e. Enroll, Experience, Label, Demonstrate, Review, Celebration. These would be the phases implemented in this research. DePorter (1999) explains enroll as the first phase to open the learning process for grasping students’ attention and developing their curiosity by addressing “What’s In It for Me” – WIIFM – for connecting it to the “real world”. The experience phase creates a common experience so that the students could relate it.

The label phase gives the opportunity for the teacher to present and provides the concepts of the lesson. The demonstrate phase provides an opportunity to the learner to apply their ‘new knowledge’ so that they could show what they know. The review phase provides the time for the learner to review the material and solidify the concepts so that they could say ‘I know that, I know this.’ The design frame involves celebrating which is an acknowledgment of completion, participation, acquisition of skills and knowledge. The researcher used these phases as the indicators for answering the second research question.

1.5.2 Conceptual Understanding

Lang and Evans (2006), describes that the conceptual understanding is personal understanding of a symbol by acquiring meaning from experience in a unique way, and developing the concepts slowly from facts and information, moving from specifics to abstractions. The indicators being used in this research for measuring students' conceptual understanding, i.e. students will be able to interpret mathematical models and students will be able to solve a problem in mathematics' model.

1.5.3 Function

A function is a rule that assigns exactly one value in a set to a given value in another set (Heddens & Speer, 2006). Function-form is referred to the function formula with the unknown variable. Thus to determine the function-form, by given the function value and data, the function-form could be found by elimination and substitution the equations (Adinawan & Sugijono, 2006). This topic is usually taught in the first semester of grade 8. In the first cycle, the researcher taught about the function-form of linear function such as $y = ax + b$. For the second cycle, the researcher taught about function-form of quadratic function. Quadratic function-form is the quadratic function with the form $ax^2 + bx + c = 0$. The students were expected to determine the function-form with given data by using elimination and substitution techniques, and find a function value.