

CHAPTER I

INTRODUCTION

1.1 Background of the Research

The World Health Organization (WHO) declared COVID-19, a respiratory communicable disease caused by a novel coronavirus, as a global pandemic on March 11, 2020 (WHO 2020). In 2020, COVID-19 pandemic is no longer merely a health problem but has become a global problem resulting in disruption in almost all sectors of life in most countries. No exception, the COVID-19 pandemic has caused major disruption to the education sector globally. The United Nations (2020, 2) asserted that the COVID-19 pandemic has caused the largest disruption of education systems in history as it abruptly changed the way teachers teach and the way students learn.

Since the first cases of COVID-19 were confirmed in early March, several regulations have been issued and kept being updated by the government as an attempt to prevent the spread of the virus and to break the transmission chain of COVID-19.

At a press conference on March 15, 2020, Joko Widodo, President of Republic of Indonesia, announced national social distancing measures to manage the effect COVID-19. On the same day, the governor of Banten Province, Wahidin Halim, increased the status of COVID-19 pandemic in Banten to an extraordinary event due to the increased widespread of COVID-19 in Banten and dismissed all schools in Banten for two weeks (DetikNews 2020). Therefore, Quiver Center Academy (QCA), a classical Christian school based in Banten Province, was closed

for two weeks until the end of March 2020. In an interview, the principals and teachers in QCA did not expect the closure would end up for months. In other interviews, all of the high-school students in QCA had absolutely no idea that it was not just a two-weeks 'holiday'. Around that time, as the spread of COVID-19 continued to increase in many places in Indonesia including Banten, social distancing policy was reinforced by regulations upon regulations issued by the government. One of the regulations was issued by Republic of Indonesia's Ministry of Health (2020, 7) on April 3, 2020 concerning "Guidelines for Large-Scale Social Restrictions for the Acceleration of COVID-19 Handling" (Permenkes No. 9, 2020). One of the required implementations stated in the regulation is the closure of schools. The closure of schools was a government's policy to protect the students and teachers from possible risks of contracting COVID-19. As we all know, school environments are places where students, teachers, parents and staff meet and potentially become a cluster of spreading of the disease.

Students, parents and teachers in Indonesia are experiencing the extraordinary ripple effect of the COVID-19 pandemic. Schools were hurriedly closed, regional quarantine occurred almost nationwide. Distance learning has been set as a policy for several regions in Indonesia due to the pandemic until it is over. One of the solutions to conduct distance learning is to adjust the learning methods and shift the classroom to an online-learning platform. Shifting to an online learning platform will allow students access education regardless of the COVID-19 outbreak period.

The learning situation in the Indonesian education sector has forced to change abruptly since mid-March 2020, especially for offline-based-learning

institutions. No offline-based education institutions are fully ready for the conditions. While the government and policy makers are doing their best trying to stop the spread of the COVID-19 outbreak, Quiver Center Academy (QCA), an offline-based classical Christian school based in Gading Serpong strive to continue to provide quality education for each of the students during this pandemic period.

As a classical school, Quiver Center Academy's scheme of education is called Trivium which consists of three parts: Grammar, Logic and Rhetoric. Classical education is believed to be the ideal type of quality school which will give birth to quality people and thinkers such as Socrates, and other famous philosophers. The classical education curriculum for Logic and Rhetoric Stage (Grade 7 - 12) was designed and intended to sharpen students reasoning skill in which they will learn how to make accurate statements, how to construct sound arguments, how to detect fallacies in arguments, and how to present what they need to present intelligibly and persuasively.

One of the main subjects used to build students' reasoning skills is Mathematics. For one full year, Grade 10 students will learn to apply the tools of logical reasoning toward formal geometric proofs and will recall and learn to apply algebra in new ways.

For half of the semester, since March – June 2020, Quiver Center Academy has hurriedly shifted to an online learning platform and conducted an 'unrehearsed' online learning method for the students. Based on the evaluation conducted by the board of school, the principals and teachers of QCA at the end of the school year in June 2020 regarding the effectiveness of the online-learning system, QCA has

performed several improvements to refine the quality of the online learning process starting at the beginning of the new school year in July 2020.

In August - September 2020, from the observations made on five students in Grade 10 Mathematics Class, all the five students, with various degrees of engagement have not been actively involved in the learning process.

Based on individual interviews and the surveys conducted for the students, the researcher also found that 60% of the students' level of self-efficacy are relatively low. When learning mathematical proofs in Geometry, students need to master the initial concepts. Concept mastery on initial concepts will help students understand mathematical concepts in the subsequent material. Concept mastery of the initial material is the basis for mastery of the next material because almost all sub-materials in geometry are interrelated.

Based on Mathematics test results, it was found that 80% of the students have not mastered the Mathematical Geometry concepts needed to prove theorems. Students still have difficulty in solving the questions given by the teacher. Students tend to memorize the proofing steps from examples in the textbook. So that when given different questions, students have difficulty doing them. This shows that students do not understand the concept thoroughly. This condition certainly affects the learning outcomes achieved by students in mastering mathematical concepts. The test results showed that 80% of the students were still below the standard score.

Applying mathematical concept mastery to prove theorems needs to be trained during the mathematics learning process in the class. Based on the observations, students' mathematical concept mastery was still low.

In this new normal period when online-learning systems are unavoidable, schools need to ensure that online learning can work as effectively as in-school learning. Through explorations and evaluations of learning and instruction strategies for the problems discussed above, the implementation of Flipped Classroom Model could be an alternative to enhance students' engagement, self-efficacy and concept mastery for Grade 10 students in Mathematics online-class. As the students will be able to learn at home before the online-class, giving a significant head-start for students' concept mastery. Thus, the limited online-class time can be maximized for discussions which gives more opportunities for students' active involvement. The Flipped Classroom model would also give opportunities to the students to prepare themselves first before discussing the concepts and exercises in the online class. The students' sense of preparedness will increase students' self-efficacy when joining the online-class and when facing related problems.

1.2 Identification of the Problem

Based on the background discussed, students' engagement, self-efficacy and concept mastery are the competencies that need to be improved in Grade 10 Mathematics subject. The problems in this research are:

- 1) With various degrees of students' engagement, all of the Grade 10 students have not been actively involved in the learning process. The level of students' engagement in the online class is relatively low. The students often need to be re-informed by the teacher about the current topic being discussed or re-instructed to do what needs to be done. The students rarely

participated in the discussion or responded to the teacher's questions. Some of the students also did not submit the homework on time.

- 2) Students' level of self-efficacy to master Mathematical Geometry concepts to prove theorems is relatively low. The students do not believe that they are able to fully understand the Mathematical concepts taught in the online class. They believed that they cannot get good scores in Mathematics due to the limitations of going to school.
- 3) Students have not mastered the Mathematical Geometry concepts needed to prove theorems. Students still have difficulty in answering concept understanding questions and in applying the concept to prove theorems. Students tend to memorize the proofing steps from examples in the textbook. When given different questions, students have difficulty doing them. This shows the students incomplete understanding the concept.

1.3 Scope of the Study

There are several limitations of the study, since the study will be conducted in a limited time frame and the effect of treatment over time is not studied. The problems examined in this study are limited to accomplishing an increase in students' engagement, self-efficacy and concept mastery through the implementation of Flipped Classroom Model for Grade 10 students at Quiver Center Academy.

1.4 Research Questions

Based on the background and problem identification that has been described, the following research questions can be formulated:

- 1) How is the implementation process of Flipped Classroom Model in Mathematics online-class to facilitate improvements in students' engagement, self-efficacy, and concept mastery?
- 2) How is the development of students' engagement in Mathematics online class when Flipped Classroom Model is implemented?
- 3) How is the development of students' self-efficacy in Mathematics online class when Flipped Classroom Model is implemented?
- 4) How is the development of students' concept mastery in Mathematics online class when Flipped Classroom Model is implemented?

1.5 Purpose of the Research

This research will implement Flipped Classroom Model in QCA Grade 10 Mathematics online class. Specifically, the purposes of this research are to:

- 1) Illustrate the implementation process of Flipped Classroom Model in Mathematics online class to facilitate improvements in students' engagement, self-efficacy and concept mastery.
- 2) Describe the development of students' engagement in Mathematics online class when Flipped Classroom Model is implemented.
- 3) Report the development of students' self-efficacy for Mathematics subject when Flipped Classroom Model is implemented.
- 4) Analyze the development of students' concept mastery in Mathematics subject when Flipped Classroom Model is implemented.

1.6 Significance of the Research

The results of this study are expected to be theoretically and practically useful. The theoretical benefit that is expected is that the results of this study can be used as a reference for further research. The results of this study can also be used as an alternative for teachers in other schools, especially to increase students' engagement, self-efficacy and concept mastery in online class. As for the practical benefits, this research is expected to be useful for schools and teachers to see opportunities to enhance education quality even during difficult times like COVID-19 pandemic. In terms of professionalism, this classroom action research can be conducted by teachers as an effort to improve professional abilities and responsibilities.

1.7 Organization of the Study

The writing of this research is divided into five chapters, each chapter has a different purpose and content.

Chapter 1 contains the explanation of the background of this research and identification of problems found in Grade 10 Mathematics subject, especially in the aspects of students' engagement, self-efficacy, and concept mastery.

Chapter 2 contains an explanation regarding the theories and sections that form the basis of this research. In addition to the theoretical basis described in this chapter, relevant research and frameworks of thought will be presented in the research.

Chapter 3 contains an explanation regarding the preparation of the research process which is described in a structured manner. In addition, this chapter also describes the research methods that will be carried out by the subject, the place and time of the research. The instruments used in this study are described coherently along with the components of their preparation and how to analyze the data used in this study.

Chapter 4 contains an explanation regarding the design and results of the research conducted. The results of research in the form of implementing the learning cycle of observation and reflection will be described in a structured manner in this chapter.

Chapter 5 contains an explanation regarding the conclusions of the research conducted as well as suggestions from the research results. The research conclusions given are related to the application of learning in several cycles as well as suggestions given from the results of the research.