FOREWORD

Praise the Lord Jesus Christ for His good works which were revealed one after another in the writer’s life as he went through life and especially in the making of this thesis.

This Thesis entitled “THE IMPLEMENTATION OF FLIPPED LEARNING AND PROBLEM BASED LEARNING TO INCREASE GRADE 10 STUDENTS’ COGNITIVE AND PSYCHOMOTOR ACHIEVEMENT IN GEOMETRICAL OPTICS TOPIC” was written to meet a partial academic requirement to obtain the degree of Master of Education.

The writer realized that without prayer, guidance, and support from various parties, this Thesis would not be finished on time. In this foreword, the writer would like to thank profusely to:

1. Connie Rasilim, S.S., B.Ed., M.Pd., as the Dean of Faculty of Education.
2. Dr. Niko Sudibjo, S.Psi., M.A., as the Head of Educational Technology Study Program.
3. Dr. Rijanto Purbojo, Psi., M.Sc., for his guidance and support along the process of the research and the writing of this thesis.
4. All lecturers who have given so much knowledge to the writer during his study in UPH Graduate School Semanggi.
5. Puni Rumanti, M.Pd., as the senior principal of Sekolah Dian Harapan – Daan Mogot, who has given the writer permission to do the research.
6. All teachers of Sekolah Dian Harapan – Daan Mogot for such a wonderful friendship they have together.

7. Ifen Yulianti, for her willingness to help as the observer during the research.

8. All students in 10 Science 1 and 10 Science 3, academic year of 2015-2016, for their help and cooperation during the research.

9. The writer’s family: mom, dad, and brother for all their love, prayers, and support.

10. Monika Hartawi, the writer’s wife, who had given relentless encouragement and so much love to the writer so that he is be able to finish this thesis.

11. All students in 12 Science, academic year of 2015 – 2016, for their continuous prayers and support, especially 12 Science 2, for teaching the writer so much about life.

12. All friends in study program of Batch 33A and Instructional Technology concentration class of Batch 33.

13. All other parties those whose names cannot be mentioned one by one.

The writer realizes that this thesis was still far from perfection. Suggestions and critiques from all the readers are very useful and will be well accepted. Finally, the writer hopes that this Thesis may be a blessing for all who read it in the future.

Jakarta, 28 Mei 2016

Writer
# TABLE OF CONTENT

ORIGINALITY STATEMENT OF THE THESIS ........................................... ii

THESIS SUPERVISOR’S APPROVAL ....................................................... iii

THESIS EXAMINATION COMMITTEE .................................................... iv

ABSTRACT ........................................................................................ vi

ABSTRAK ........................................................................................ vii

FOREWORD ........................................................................................ viii

TABLE OF CONTENT .......................................................................... x

LIST OF TABLES ................................................................................ xii

LIST OF FIGURES ................................................................................ xiii

CHAPTER I - INTRODUCTION ............................................................... 1

  1.1 Background of Study ................................................................. 1
  1.2 Identification of Problems ......................................................... 4
  1.3 Limitation of Problems ............................................................. 4
  1.4 Research Questions .................................................................. 4
  1.5 Purpose of Study ...................................................................... 5
  1.6 Benefit of Study ....................................................................... 5

CHAPTER II – LITERATURE REVIEW .................................................. 7

  2.1 Student Achievement ............................................................... 7
  2.2 The Flipped Learning ............................................................... 18
  2.3 Problem-Based Learning (PBL) ................................................. 24
  2.4 Related Research ..................................................................... 29
  2.5 Conceptual Framework and Hypothesis .................................... 30
CHAPTER III – RESEARCH METHOD .................................................................33

3.1 Research Model..................................................................................33
3.2 Subjects, Setting, Place, and Time of the Research ..................34
3.3 Research Procedures ......................................................................35
3.4 Research Instruments .....................................................................37
3.5 Data Analysis ....................................................................................42

CHAPTER IV – ANALYSIS AND DISCUSSION ..............................................50

4.1 The Results of Research .................................................................50
4.2 Discussion .......................................................................................68
4.3 Limitations of the Research ..............................................................72

CHAPTER V – CONCLUSION AND SUGGESTION ......................................74

5.1 Conclusion .......................................................................................74
5.2 Suggestions .....................................................................................75

REFERENCES ..........................................................................................76

APPENDICES

PUBLICATION PERMISSION FORM

BIOGRAPHY
LIST OF TABLES

Table 2.1 – Competency standard, Basic Competence and Indicators of Geometrical Optics Topic......................................................9

Table 2.2 – Categories of the Cognitive Process Dimension and Related Cognitive Processes.................................................................12

Table 2.3 – The Types and Subtypes of Knowledge .......................................13

Table 2.4 – Bloom Taxonomy – The Psychomotor Domain ..........................16

Table 2.5 – Five steps of implementing PBL and teacher’s attitude during each step ......28

Table 3.1 – Flipped Learning Checklist ........................................................37

Table 3.2 – PBL Observation Sheet ................................................................38

Table 3.3 – Example for Psychomotor Outcome Checklist.............................39

Table 3.4 – Summary of the Research Instruments .........................................40

Table 3.5 – Learning Activities and Instrument Used in Each Cycle ...............41

Table 3.6 – Summary Table for Each Cycle .................................................43

Table 3.7 – Flipped Learning Score ..............................................................43

Table 3.8 – PBL Participation Categories .....................................................44

Table 3.9 – Cognitive and Psychomotor Score Conversion Table ..................47

Table 3.10 – Correlation Coefficient Value Interpretation ............................47

Table 4.1 – Flipped Learning and PBL Score Correlation Table – 1st Cycle ........54

Table 4.2 – PBL, Cognitive, and Psychomotor Score Correlation Table – 1st Cycle ......54

Table 4.3 – Flipped Learning and PBL Score Correlation Table – 2nd Cycle ..........59

Table 4.4 – PBL, Cognitive, and Psychomotor Score Correlation Table – 2nd Cycle ......59

Table 4.5 – Flipped Learning and PBL Score Correlation Table – 3rd Cycle ..........63

Table 4.6 – PBL, Cognitive, and Psychomotor Score Correlation Table – 3rd Cycle ......63
LIST OF FIGURES

Figure 2.1 - Conceptual Framework of the Research ..............................................31
Figure 3.1 - Kemmis & McTaggart’s model of CAR .............................................33
Figure 4.1 – Flipped Learning Participation Category Distribution – 1st Cycle ....51
Figure 4.2 – PBL Participation Category Distribution – 1st Cycle .....................52
Figure 4.3 – Flipped Learning Participation Category Distribution – 2nd Cycle...57
Figure 4.4 – PBL Participation Category Distribution – 2nd Cycle .................57
Figure 4.5 – PBL Participation Category Distribution – 3rd Cycle .................61
Figure 4.6 – PBL Participation Category Distribution – 3rd Cycle .................61
Figure 4.7 – Aspects of Flipped Learning Scores ..............................................64
Figure 4.8 – Flipped Learning Participation Categories ....................................64
Figure 4.9 – PBL Participation Categories ......................................................65
Figure 4.10 – Aspects of PBL Process Scores ..................................................66
Figure 4.11 – Cognitive Test Scores ...............................................................66
Figure 4.12 – Psychomotor Outcome Scores ...................................................67