## TABLE OF CONTENT

### APPROVAL FORM

### DECLARATION

### PREFACE

### ACKNOWLEDGEMENT

### ABSTRACT

### TABLE OF CONTENT

### TABLE LIST

### FIGURE LIST

### APPENDIX LIST

### CHAPTER I INTRODUCTION
   - A. Background .......................................................... 1
   - B. Research Problem .................................................. 3
   - C. Research Objective .................................................. 4
   - D. The Significance of Research .................................. 4

### CHAPTER II PROBLEM BASED EXPERIMENT AND PROBLEM SOLVING SKILLS
   - A. Problem based Learning .......................................... 5
   - B. Problem based Experiment ...................................... 6
   - C. Problem Solving Skill ............................................ 10
   - D. Content Analysis of Separation Method ...................... 12
   - E. Rationale Framework ............................................. 15

### CHAPTER III METHODOLOGY
   - A. Location and Research Subject ................................. 19
   - B. Research Method .................................................. 17
   - C. Operational Definition ......................................... 17
   - D. Research Procedure ............................................ 18

Siti Ashri Sahidah Lisdiani, 2013
The Improvement Of Students Problem Solving Skills In Concept Of Separation Method Through Problem Based Experiment
Universitas Pendidikan Indonesia | repository.upi.edu
### E. Instructional Tools

- **22**

### F. Research Instrument

- **24**

### G. Instrument Development

- **29**

### H. Data Analysis Procedure

- **32**

### CHAPTER IV RESULT AND DISCUSSION

#### A. Result

- **35**

1. The improvement of Students’ Problem Solving Skills in Domain of Problem Analysis

2. The improvement of Students’ Problem Solving Skills in Domain of Problem Solving Planning

3. The improvement of Students’ Problem Solving Skills in Domain of Domain of Conducting Problem Solving

4. The improvement of Students’ Problem Solving Skills in Domain of Problem Solving Evaluating

5. Students’ Response toward Problem Based Experiment

6. The Implementation of Problem Based Experiment

#### B. Discussion

- **54**

### CHAPTER V CONCLUSION AND RECOMMENDATION

#### A. Conclusion

- **64**

#### B. Recommendation

- **64**

### BIBLIOGRAPHY

- **66**

### APPENDICES

- **68**
## TABLE LIST

2.1. Rationale Framework .................................................................16
3.1. Syntax Arrangement of Problem based Experiment in each meeting .......... 22
3.2. Blueprint of Problem Solving Skill Test ........................................... 25
3.3. Blueprint of performance test rubric ............................................... 27
3.4. Analyses of Instrument Trial .......................................................... 31
4.1. Improvement of Problem Solving Skills ............................................ 36
4.2. Improvement of Problem Solving Skills in Domain of Problem Analysis .... 38
4.3. Improvement of Problem Solving Skills in Domain of Problem Solving Planning .39
4.4. Improvement of Problem Solving Skills in Domain of Conducting Problem Solving ................. 40
4.5. Improvement of Problem Solving Skills in Domain of Problem Solving Evaluating .................. 41
4.6. Students’ Response toward Science Instruction ................................... 43
4.7. Students’ Response toward Problem based Experiment ........................ 44
4.8. Observation Result of Teacher Activity ........................................... 48
4.9. Observation Result of Students Activity .......................................... 51
4.10. Task Fulfillment of problem based Experiment ................................. 53
FIGURE LIST

2.1. Problem based Learning Cycle (Silver, 2005) .................................................. 5
2.2. Problem based Learning: Gallet Model ............................................................ 8
3.1. Research Plot .................................................................................................... 21
4.1. Pre-test and Posttest Comparisons of Problem Solving Test............................. 37
4.2. Percentage Comparisons of Teacher Activities during the Implementation ....... 50
4.3. Percentage Comparisons of Students’ Activity .............................................. 57
APPENDIX TABLE

A.1. Lesson Plan ........................................................................................................... 63
A.2. Experiment Module
   A.2.1. Experiment Module ..................................................................................... 68
   A.2.2. Experiment Module 2 ................................................................................ 69
   A.2.3. Experiment Module 3 ................................................................................ 70
   A.2.4. Experiment Module 4 ................................................................................ 71
A.3. Individual Worksheet .......................................................................................... 77
B.1. Problem Solving Test Blue Print .......................................................................... 78
B.2. Problem Solving Test Draft ................................................................................ 87
B.3. Performance Test Rubric .................................................................................... 92
B.4. Performance Test Draft ..................................................................................... 94
C.1. Teacher Observation Sheet
   C.1.1. Teacher Observation Sheet of 1st Meeting ................................................. 96
   C.1.2. Teacher Observation Sheet of 2nd Meeting ............................................... 99
   C.1.3. Teacher Observation Sheet of 3rd Meeting ............................................... 100
C.2. Student Observation Sheet
   C.2.1. Student Observation Sheet of 1st Meeting ............................................... 102
   C.2.2. Student Observation Sheet of 2nd Meeting ............................................. 104
   C.2.3. Student Observation Sheet of 3rd Meeting ............................................. 106
C.3. Student questionnaire
   C.3.1. Blueprint of Students’ Questionnaire ....................................................... 108
   C.3.2. Students’ Questionnaire Draft ................................................................. 110
D.1. Instrument Analysis of Problem Solving Test .................................................... 112
D.2. Data interpretation of Problem Solving Test Analysis ...................................... 113
D.3. Judgment Result ............................................................................................... 114
E.1. Data Distribution of Pre-Test ............................................................................ 117
E.2. Data Distribution of Post-Test ................................................................. 118
E.3. Analysis for Problem Solving Test ..........................................................119
E.4. Data Distribution of 1st Performance Data Analysis ......................................120
E.5. Data Distribution of 2nd Performance Data Analysis ..................................... 121
E.6. Normalized gain Analysis for Performance Test ............................................122
E.7. Questionnaire Analysis .............................................................................123
E.8. Analysis of Teacher Observation Sheet
    E.9.1. Analysis of Teacher Observation Sheet in 1st Meeting .......................... 124
    E.9.2. Analysis of Teacher Observation Sheet in 2nd Meeting ......................... 126
    E.9.3. Analysis of Teacher Observation Sheet in 3rd Meeting ......................... 127
E.9. Analysis of Students Observation Sheet
    E.9.4. Analysis of Students Observation Sheet in 1st Meeting .......................... 128
    E.9.5. Analysis of Students Observation Sheet in 2nd Meeting ........................ 131
    E.9.6. Analysis of Students Observation Sheet in 3rd Meeting ........................ 133
E.10. Analysis of Worksheet Fulfillment
    E.10.1. Analysis of Group Worksheet .......................................................... 135
    E.10.2. Analysis of Worksheet Fulfillment ...................................................... 136
F.  Documents ....................................................................................................145
F.1 Covering Letter of Research .......................................................................156
F.2 Annotation Letter of Research .....................................................................157
F.3 Documentation ............................................................................................160
F.4 Author’s Profile ..........................................................................................162