



## **UNDERGRADUATE THESIS**

# **APPLICATION OF SIMPLE ADDITIVE WEIGHTING FOR THE EVALUATION OF STUDENT ACTIVITY BASED ON GUIDANCE INTENSITY AND INTERVAL**

**TAUFIK HIDAYAT**

NPM 19081010027

## **THESIS ADVISORS**

Dr. Rizky Parlika, S. Kom, M. Kom.

Dr. Intan Yuniar Purbasari, S. Kom, M. Sc.

**MINISTRY OF HIGHER EDUCATION, SCIENCE, AND TECHNOLOGY  
UNIVERSITAS PEMBANGUNAN NASIONAL VETERAN JAWA TIMUR  
FACULTY OF COMPUTER SCIENCE  
INFORMATICS STUDY PROGRAM  
SURABAYA  
2026**

## APPROVAL SHEET

### APPLICATION OF SIMPLE ADDITIVE WEIGHTING FOR THE EVALUATION OF STUDENT ACTIVITY BASED ON GUIDANCE INTENSITY AND INTERVAL

By:  
TAUFIK HIDAYAT  
NPM. 19081010027

Has been defended before, and accepted by, the Board of Assessors of the Thesis Examination of the Informatics Study Program, Faculty of Computer Science, Universitas Pembangunan Nasional Veteran Jawa Timur, on June 17, 2026:

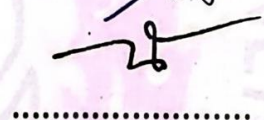
Dr. Rizky Parlika, S.Kom, M.Kom  
NIP. 19840518 2021211 003

  
..... (Advisor I)

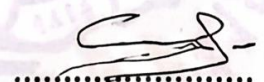
Dr. Intan Yuniar Purbasari, S.Kom, M.Sc  
NIP. 198006022025212029

  
..... (Advisor II)

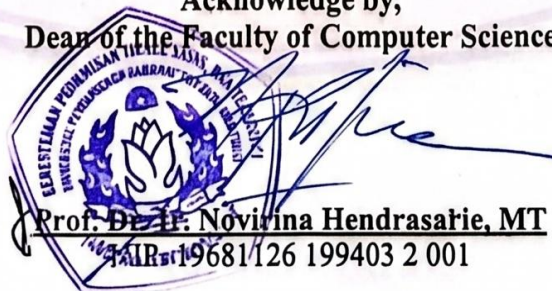
Dr. Ir. Mohammad Idhom, S.P., S.Kom., M.T  
NIP. 198303102021211006

  
..... (Head Assessor)

Ardhon Rakhmadi, S.Tr.T., M.Kom  
NIP. 199108052024061002

  
..... (Assessor I)

Acknowledge by,  
Dean of the Faculty of Computer Science

  
Prof. Dr. Ir. Novirina Hendrasarie, MT  
NIP. 19681126 199403 2 001

## APPROVAL SHEET

### APPLICATION OF SIMPLE ADDITIVE WEIGHTING FOR THE EVALUATION OF STUDENT ACTIVITY BASED ON GUIDANCE INTENSITY AND INTERVAL

By:

TAUFIK HIDAYAT

NPM :19081010027

Approved to proceed to the Thesis Examination

Approved by,

Coordinator of Informatics Study Program  
Faculty of Computer Science



Dr. Intan Yuniar Purbasari, S.Kom. M.Sc.

NIP. 19800602 202521 2029

## STATEMENT OF ORIGINALITY

I am the underdesign:

Student Name : Taufik Hidayat  
NPM : 19081010027  
Degree Program : Bachelor (S1)  
Study Program : Informatics  
Faculty : Faculty of Computer Science

Hereby declares that this undergraduate thesis contains no part of any other scientific work that has been submitted to obtain an academic degree at any higher education institution. Furthermore, it does not contain any work or opinions previously written or published by others, except for those which are explicitly cited in this thesis and listed completely in references.

And I declare that this scientific document is free from elements of plagiarism. If in the future indications of plagiarism are found in this Thesis, I am willing to accept sanctions in accordance with the applicable laws and regulations.

Thus, I made this statement without any coercion from anyone and to be used as it should.



Surabaya, June 17<sup>th</sup> 2026  
Declarant,



**TAUFIK HIDAYAT**  
NPM. 19081010027

## ABSTRACT

Student Name / NPM : Taufik Hidayat / 19081010027  
Thesis Title : Design and Development of a Lecturer Guidance Monitoring and Ranking Application Based on the Laravel Framework and Simple Additive Weighting Method  
Advisor : 1. Dr. Rizky Parlika, S.Kom, M.Kom  
2.Dr. Intan Yuniar Purbasari, S. Kom, M. Sc

The guidance process, which is still recorded manually on paper, carries a high risk of losing important instructions and makes it difficult for lecturers to monitor student progress fairly. Therefore, this research aims to develop a web-based monitoring application using Laravel, equipped with the Simple Additive Weighting (SAW) method to evaluate student activity levels based on the frequency and time intervals of their guidance sessions. This activity assessment is calculated automatically through three main criteria: student attendance rate (40% weight), the time interval between meetings (30% weight), and the student's speed in inputting guidance notes (30% weight). The application testing results using the Black Box method on 18 scenarios show that all features function properly without any errors. Furthermore, the SAW calculation results in the application are proven to be 100% identical to the manual calculations, placing a student named Rina Santika in the first rank with a final score of 0.960. Overall, the implementation of this application has proven successful in digitalizing guidance management while providing a clear and transparent assessment method for the institution.

**Keywords:** Academic Guidance, Monitoring Application, Simple Additive Weighting, Laravel, Academic Participatio

## ACKNOWLEDGMENTS

Praise be to Allah SWT for all His graces, guidance, and gifts to the author so that the thesis proposal with the title “**APPLICATION OF SIMPLE ADDITIVE WEIGHTING FOR THE EVALUATION OF STUDENT ACTIVITY BASED ON GUIDANCE INTENSITY AND INTERVAL**” can be completed properly.

The author would like to thank Mr. Dr. Rizky Parlika, S. Kom, M. Kom. as Supervisor 1 and Mrs. Dr. Intan Yuniar Purbasari, S. Kom. M.Sc. as Supervisor 2 who are willing to take their time to provide guidance, advice and motivation to the author. In addition, during the preparation of the thesis proposal, the author also received a lot of assistance from various parties. For this the author would like to thank the:

1. Mr. Prof. Dr. Ir. Ahmad Fauzi, M.MT, Rector of the “Veteran” National Development University of East Java.
2. Mrs. Prof. Dr. Ir. Novirina Hendrasarie, M.T. as the Dean of the Faculty of Computer Science, National Development University "Veteran" East Java.
3. Mrs. Dr. Intan Yuniar Purbasari, S. Kom. M.Sc. as the Coordinator of Informatics Study Program, Faculty of Computer Science, National Development University of East Java.
4. Mr. Dr. Rizky Parlika, S. Kom, M. Kom. my primary advisor, and Mrs Dr. Intan Yuniar Purbasari, my second academic advisor who has patiently devoted his time, energy, and thought to guiding me through the completion of this thesis.
5. Mr. Dr. Ir. Mohammad Idhom, S.P., S. Kom., M.T and Mr. Ardhon Rakhmadi, S.Tr.T., M.Kom as the faculty examiners, who provided very constructive suggestions and feedback for improving this thesis.
6. Lecturers of the Informatics Departement, National Development University of East Java Veterans for their guidance during the author's education.
7. My beloved mother, Thank you for being a constant source of strength and endless support throughout this journey, especially during the research process

and the completion of this thesis. Thank you for patiently waiting for me to finish this study, and I sincerely apologize for the time it took me to finally reach this point. Thank you for always praying for your child so that all matters regarding this study go smoothly, especially while working on this thesis. You have always been my encourager when I am tired, doubtful, and overwhelmed, always embracing me with prayers, encouragement, and unconditional love. Your sacrifices, affection, and belief in me have become one of the biggest reasons why I was able to complete this thesis. May Allah SWT always bestow upon you good health, happiness, and a long life, so that one day I may repay even a small fraction of all the kindness and love you have given me. I express my deepest gratitude, and I love you beyond words.

8. My dearest father, My first hero and the greatest role model in my life. Thank you very much for all the sincere and endless prayers you have offered for the smooth progress of this thesis. Thank you also because you never get tired of continuously reminding, motivating, and encouraging me every time I start to feel tired or burnt out. Your encouragement has truly become a strong reason for me not to give up easily and to want to quickly complete this college responsibility. Your simple advice always succeeds in bringing back my spirit. May Allah SWT always grant you good health, happiness, and a long life. I truly hope that one day I will have many opportunities to repay all the love, patience, and kindness that you have given me all this time. Thank you so much for everything, Dad.
9. To my beloved older brother, Mas Aris Samsudin. Thank you very much for the sacrifices and support given so that I could pursue this education smoothly. Thank you, Mas, for helping to finance my college education all this time until I could complete this study. Thank you also for always being a patient mentor in guiding and helping me through various difficulties during my college years. The continuous advice and encouragement you have given have become a special energy for me to complete this responsibility. This achievement is certainly inseparable from your kindness, Mas. Without your presence, help, and sacrifices, Mas, this achievement would never have been realized. May Allah SWT repay all your kindness with smooth sustenance, success, and

multiplied blessings. I express my deepest gratitude and endless love for everything you have done for me.

10. To my beloved girlfriend, Naila Al Ghifarah. Thank you for being one of the most important people who accompanied me throughout this long and challenging journey in completing this thesis. Thank you for all the endless support and encouragement you have always given every time I felt tired. Thank you for always caring and patiently reminding me about the progress of my thesis, ensuring I do not procrastinate on this responsibility. Thank you for always being present during times of exhaustion, doubt, and pressure, for continuously providing emotional support when I felt overwhelmed, and for always reminding me to keep moving forward even when I doubted myself. More than that, I am very grateful because amidst your busy schedule, you were always willing to spare your precious time just to sit and accompany me in typing and compiling this thesis report. Your presence and care have truly become an additional energy that made me capable of completing this stage. Thank you for standing beside me and being an irreplaceable part of this journey.
11. Thank you to my friend Mokhamad Kiromul Amni, who never gets tired of reminding and encouraging me to quickly complete this thesis. Your care and encouragement mean a lot to me.

The author realizes that in the preparation of the following thesis there are many shortcomings. For this reason, constructive criticism and suggestions from all parties are highly expected for the perfection of writing the following thesis. Finally, with all the limitations that the author has, hopefully the following report can be useful for all parties in general and the author in particular.

Surabaya, June 17<sup>th</sup> 2026



Taufik Hidayat

## TABLE OF CONTENTS

|                                                  |            |
|--------------------------------------------------|------------|
| <b>APPROVAL SHEET .....</b>                      | <b>ii</b>  |
| <b>STATEMENT OF ORIGINALITY .....</b>            | <b>iv</b>  |
| <b>ABSTRACT.....</b>                             | <b>v</b>   |
| <b>ACKNOWLEDGMENTS .....</b>                     | <b>vi</b>  |
| <b>LIST OF FIGURES.....</b>                      | <b>xii</b> |
| <b>LIST OF TABLE .....</b>                       | <b>xiv</b> |
| <b>CHAPTER I .....</b>                           | <b>1</b>   |
| <b>INTRODUCTION .....</b>                        | <b>1</b>   |
| 1.1 Background.....                              | 1          |
| 1.2 Problem Formulation .....                    | 3          |
| 1.3 Research Objectives.....                     | 3          |
| 1.4 Research Benefits.....                       | 4          |
| 1.5 Scope of the Problem .....                   | 4          |
| <b>CHAPTER II.....</b>                           | <b>6</b>   |
| <b>LITERATURE REVIEW .....</b>                   | <b>6</b>   |
| 2.1 Review of Previous Studies .....             | 6          |
| 2.2 Design and Development.....                  | 9          |
| 2.3 Application.....                             | 9          |
| 2.4 Monitoring Application .....                 | 9          |
| 2.5 Guidance Application .....                   | 10         |
| 2.6 Ranking System .....                         | 12         |
| 2.7 Decision Support System (SPK).....           | 12         |
| 2.8 Simple Additive Weighting (SAW) Method ..... | 13         |
| 2.9 Definition of PHP .....                      | 15         |
| 2.10 Framework.....                              | 15         |
| 2.11 Data Base .....                             | 16         |
| 2.12 MySQL .....                                 | 16         |
| 2.13 Application Features .....                  | 17         |
| 2.14 Use Case Diagram.....                       | 18         |
| 2.15 ERD (Entity-Relationship Diagram).....      | 18         |
| 2.16 CDM (Conceptual Data Model).....            | 19         |

|                                     |                                                 |           |
|-------------------------------------|-------------------------------------------------|-----------|
| 2.17                                | PDM (Physical Data Model).....                  | 19        |
| <b>CHAPTER III .....</b>            |                                                 | <b>20</b> |
| <b>RESEARCH METHODOLOGY .....</b>   |                                                 | <b>20</b> |
| 3.1                                 | Research Design .....                           | 20        |
| 3.1.1                               | Problem Identification .....                    | 21        |
| 3.1.2                               | Data Collection .....                           | 21        |
| 3.1.3                               | System Design Method .....                      | 22        |
| 3.1.4                               | System Implementation .....                     | 22        |
| 3.1.5                               | System Testing.....                             | 23        |
| 3.1.6                               | System Evaluation .....                         | 23        |
| 3.2                                 | Application Design .....                        | 23        |
| 3.2.1                               | Use Case Diagram.....                           | 23        |
| 3.2.2                               | Activity Diagram .....                          | 41        |
| 3.2.3                               | Sequence Diagram .....                          | 57        |
| 3.2.4                               | Entity Relationship Diagram.....                | 63        |
| 3.2.5                               | Conceptual Data Model .....                     | 64        |
| 3.2.6                               | Physical Data Model .....                       | 65        |
| 3.2.7                               | User Interface Mockup Design .....              | 67        |
| 3.3                                 | SAW Calculation .....                           | 77        |
| 3.4                                 | Preference Value Calculation ( <i>V</i> ) ..... | 82        |
| <b>CHAPTER IV .....</b>             |                                                 | <b>84</b> |
| <b>RESULTS AND DISCUSSION .....</b> |                                                 | <b>84</b> |
| 4.1                                 | Code Implementation.....                        | 84        |
| 4.1.1                               | Implementation of the SAW Method.....           | 84        |
| 4.1.2                               | Save Notes Feature .....                        | 89        |
| 4.1.3                               | Scheduling Request Feature.....                 | 91        |
| 4.2                                 | System Implementation Results.....              | 95        |
| 4.2.1                               | Login Page Interface .....                      | 95        |
| 4.2.2                               | Registration Page Interface .....               | 96        |
| 4.2.3                               | Student Verification Page Interface .....       | 97        |
| 4.2.4                               | Administrator Dashboard Page Interface .....    | 98        |
| 4.2.5                               | Study Program List Page Interface .....         | 99        |
| 4.2.6                               | Add Study Program Form Interface.....           | 99        |

|                                     |                                                                    |            |
|-------------------------------------|--------------------------------------------------------------------|------------|
| 4.2.7                               | Advisor List Page Interface .....                                  | 100        |
| 4.2.8                               | Add Advisor Form Interface .....                                   | 101        |
| 4.2.9                               | Supervision Type Page Interface .....                              | 102        |
| 4.2.10                              | Add Supervision Type Form Interface.....                           | 103        |
| 4.2.11                              | Advisor Supervision Type Plotting Page Interface.....              | 103        |
| 4.2.12                              | Add Advisor Supervision Type Plotting Form Interface .....         | 104        |
| 4.2.13                              | Student Dashboard Page Interface .....                             | 105        |
| 4.2.14                              | Thesis Advisor Request Page Interface .....                        | 106        |
| 4.2.15                              | Add Advisor Request Form Interface .....                           | 106        |
| 4.2.16                              | Advisor Dashboard Page Interface .....                             | 107        |
| 4.2.17                              | Advisor Request Verification Page Interface.....                   | 108        |
| 4.2.18                              | Supervised Student List Page Interface .....                       | 109        |
| 4.2.19                              | Supervision Schedule Page Interface.....                           | 110        |
| 4.2.20                              | Add Supervision Schedule Form Interface .....                      | 111        |
| 4.2.21                              | Schedule Registration Detail Page Interface.....                   | 111        |
| 4.2.22                              | Student Dashboard Page Interface .....                             | 112        |
| 4.2.23                              | Advisor Supervision Schedule Page Interface .....                  | 113        |
| 4.2.24                              | Schedule Registration Form Interface.....                          | 115        |
| 4.2.25                              | Supervision Registration Verification by Advisor Interface.....    | 115        |
| 4.2.26                              | Student Attendance Verification Process Interface.....             | 116        |
| 4.2.27                              | Add Note Access Interface .....                                    | 117        |
| 4.2.28                              | Supervision Note Pending Verification Notification Interface ..... | 117        |
| 4.2.29                              | Supervision Note Detail and Verification Interface.....            | 118        |
| 4.2.30                              | SAW Calculation Page Interface .....                               | 119        |
| 4.3                                 | Validation of SAW Calculation Results .....                        | 120        |
| 4.4                                 | Application Testing Results .....                                  | 121        |
| <b>CHAPTER V .....</b>              |                                                                    | <b>125</b> |
| <b>RESULTS AND DISCUSSION .....</b> |                                                                    | <b>125</b> |
| 5.1                                 | Conclusions.....                                                   | 125        |
| 5.2                                 | Recommendations.....                                               | 125        |
| <b>BIBLIOGRAPHY .....</b>           |                                                                    | <b>127</b> |

## LIST OF FIGURES

|                                                                                  |    |
|----------------------------------------------------------------------------------|----|
| Figure 3. 1 Research Design .....                                                | 20 |
| Figure 3. 2 Application Design with Prototyping Method.....                      | 22 |
| Figure 3. 3 Use Case Diagram .....                                               | 24 |
| Figure 3. 4 Student Registration Activity Diagram .....                          | 42 |
| Figure 3. 5 Student Registration Verification Activity Diagram .....             | 43 |
| Figure 3. 6 Activity Diagram Entri Data Dosen .....                              | 44 |
| Figure 3. 7 Student Login Activity Diagram .....                                 | 45 |
| Figure 3. 8 Activity Diagram Login Dosen .....                                   | 46 |
| Figure 3. 9 Advisor Mapping Activity Diagram.....                                | 47 |
| Figure 3. 10 Thesis Supervisor Request Activity Diagram .....                    | 48 |
| Figure 3. 11 Student Request Verification Activity Diagram.....                  | 49 |
| Figure 3. 12 Create Supervision Schedule Activity Diagram .....                  | 50 |
| Figure 3. 13 Supervision Schedule Request Activity Diagram .....                 | 51 |
| Figure 3. 14 Supervision Schedule Verification Activity Diagram .....            | 52 |
| Figure 3. 15 Supervision Notes Activity Diagram.....                             | 53 |
| Figure 3. 16 Student Supervision Activity Diagram.....                           | 54 |
| Figure 3. 17 View Student Supervision History Activity Diagram .....             | 55 |
| Figure 3. 18 Student Supervision History Activity Diagram.....                   | 56 |
| Figure 3. 19 Student Ranking Activity Diagram .....                              | 57 |
| Figure 3. 20 Thesis Supervisor Request Sequence Diagram .....                    | 58 |
| Figure 3. 21 Student Request Verification Sequence .....                         | 59 |
| Figure 3. 22 Supervision Schedule Request Sequence Diagram .....                 | 60 |
| Figure 3. 23 Supervision Schedule Verification Sequence Diagram Verifikasi ..... | 61 |
| Figure 3. 24 Student Ranking Sequence Diagram .....                              | 62 |
| Figure 3. 25 Entity Relationship Diagram .....                                   | 63 |
| Figure 3. 26 Conceptual Data Model.....                                          | 64 |
| Figure 3. 27 Physical Data Model.....                                            | 66 |
| Figure 3. 28 Login Page.....                                                     | 67 |
| Figure 3. 29 Registration Page.....                                              | 68 |
| Figure 3. 30 Student Account Verification Interface .....                        | 68 |
| Figure 3. 31 Add Lecturer Interface .....                                        | 69 |
| Figure 3. 32 Supervision Type Page .....                                         | 70 |
| Figure 3. 33 Lecturer Supervision Type Assignment Page .....                     | 70 |
| Figure 3. 34 Lecturer Supervision Type Assignment Page .....                     | 71 |
| Figure 3. 35 Lecturer Supervision Type Assignment Form Page .....                | 72 |
| Figure 3. 36 Supervisor Request Form Page .....                                  | 72 |
| Figure 3. 37 Supervisor Request History Page .....                               | 73 |
| Figure 3. 38 Supervision Request Verification Page .....                         | 74 |
| Figure 3. 39 Supervision Schedule Menu Page .....                                | 74 |
| Figure 3. 40 Add Supervision Schedule Page.....                                  | 75 |
| Figure 3. 41 Supervision Schedule Page.....                                      | 76 |

|                                                                                 |     |
|---------------------------------------------------------------------------------|-----|
| Figure 3. 42 Advisor Dashboard Page .....                                       | 76  |
| Figure 4. 1 Login Page.....                                                     | 95  |
| Figure 4. 2 Registration Page.....                                              | 96  |
| Figure 4. 3 Student Verification Page.....                                      | 97  |
| Figure 4. 4 Administrator Dashboard Page.....                                   | 98  |
| Figure 4. 5 Study Program List Page .....                                       | 99  |
| Figure 4. 6 Add Study Program Form Interface .....                              | 99  |
| Figure 4. 7 Advisor List Page .....                                             | 100 |
| Figure 4. 8 Add Advisor Form Interface .....                                    | 101 |
| Figure 4. 9 Supervision Type Page.....                                          | 102 |
| Figure 4. 10 Add Supervision Type Form Interface .....                          | 103 |
| Figure 4. 11 Advisor Supervision Type Plotting Page.....                        | 104 |
| Figure 4. 12 Add Advisor Supervision Type Plotting Form Interface.....          | 104 |
| Figure 4. 13 Student Dashboard Page.....                                        | 105 |
| Figure 4. 14 Thesis Advisor Request Page .....                                  | 106 |
| Figure 4. 15 Add Advisor Request Form Interface.....                            | 107 |
| Figure 4. 16 Advisor Dashboard Page .....                                       | 107 |
| Figure 4. 17 Advisor Request Verification Page .....                            | 108 |
| Figure 4. 18 Supervised Student List Page .....                                 | 109 |
| Figure 4. 19 Supervision Schedule Page.....                                     | 110 |
| Figure 4. 20 Add Supervision Schedule Form Interface.....                       | 111 |
| Figure 4. 21 Schedule Registration Detail Page .....                            | 112 |
| Figure 4. 22 Student Dashboard Page.....                                        | 113 |
| Figure 4. 23 Advisor Supervision Schedule Page.....                             | 114 |
| Figure 4. 24 Schedule Registration Form Interface .....                         | 115 |
| Figure 4. 25 Supervision Registration Verification by Advisor Interface .....   | 116 |
| Figure 4. 26 Student Attendance Verification Process Interface .....            | 116 |
| Figure 4. 27 Add Note Access Interface .....                                    | 117 |
| Figure 4. 28 Supervision Note Pending Verification Notification Interface ..... | 118 |
| Figure 4. 29 Supervision Note Detail and Verification Interface .....           | 118 |
| Figure 4. 30 SAW Weighting Calculation Interface.....                           | 119 |
| Figure 4. 31 SAW Calculation Ranking Results .....                              | 120 |

## LIST OF TABLE

|                                                                  |     |
|------------------------------------------------------------------|-----|
| Table 2.1 Review of Previous Studies .....                       | 6   |
| Table 3. 1 Actor Definition.....                                 | 25  |
| Table 3. 2 Login Use Case Scenario.....                          | 26  |
| Table 3. 3 Register Use Case Scenario .....                      | 27  |
| Table 3. 4 Student Registration Verification Use Case .....      | 28  |
| Table 3. 5 Advisor Data Entry Use Case .....                     | 29  |
| Table 3. 6 Advisor Plotting Use Case.....                        | 30  |
| Table 3. 7 Advisor Request Use Case.....                         | 31  |
| Table 3. 8 Student Request Verifiacation Use Case .....          | 32  |
| Table 3. 9 Create Advising Schedule Use Case.....                | 33  |
| Table 3. 10 Advising Schedule Request Use Case .....             | 34  |
| Table 3. 11 Student Advising Schedule Verification Use Case..... | 35  |
| Table 3. 12 Student Advising Notes Use case .....                | 36  |
| Table 3. 13 Student Notes Verification Use Case.....             | 37  |
| Table 3. 14 Advising History Use Case.....                       | 38  |
| Table 3. 15 View Student Advising Use Case .....                 | 39  |
| Table 3. 16 Student Ranking Use Case.....                        | 40  |
| Table 3. 17 Code.....                                            | 77  |
| Table 3. 18 Detailed Testing Data .....                          | 78  |
| Table 3. 19 Percentage Weights.....                              | 78  |
| Table 3. 20 Matriks Keputusan (x) .....                          | 80  |
| Table 3. 21 Normalized Matrix (R) .....                          | 81  |
| Table 3. 22 Final Student Ranking Results.....                   | 83  |
| Table 4. 1 Validation of SAW Calculation Results .....           | 121 |
| Table 4. 2 Black Box Testing Results.....                        | 122 |