

## PREFACE

Praise and gratitude to God Almighty who has given grace and His grace, so that the author can complete this thesis well. This thesis was prepared to fulfill some of the requirements necessary to achieve a Bachelor of Education degree in Bilingual Physics Education Study Program, Faculty of Mathematics and Sciences, State University of Medan.

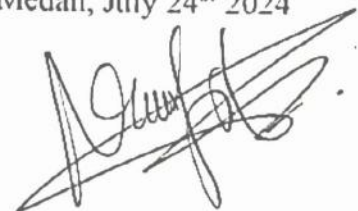
This thesis has been prepared in accordance with standard procedures applicable at the Faculty of Mathematics and Science at the State University of Medan, beginning with the stage of determining research topics, preparing and presenting seminar proposals, conducting research, thesis preparation, and the thesis defense examination. The preparation of this thesis would not have been completed without support from various parties is acknowledged by the author. Through this opportunity, thanks are extended by the author to Mrs. Dr. Ani Sutiani, M.Si as Dean of the Faculty of Mathematics and Science, Mrs. Dr. Yuni Warty, S.Pd., M.Si as Chair of the Physics Department, Mr. Budiman Nasution, S.Pd., M.Si as secretary of the Physics Department, Mr. Sabani S.Pd, M.Si as Chair of the Physics Education Study Program, Mr. M. Iqbal, S.E., M.M as admin of the Physics Department, Mrs. Dr. Ely Djulia, M.Pd as Chair of the Bilingual Study Program, and Mr. Prof. Dr. Makmur Sirait, M.Si as Academy Supervisor.

Furthermore, Mr. Dr. Alkhafi Maas Siregar, M.Si is thanked by the author as Thesis Supervisor for his patience in guidance, waiting for the author for so long to complete this thesis, and motivating her, so that all stages in preparing this thesis can be passed well. Also acknowledged are Mr. Drs. Jonny H. Panggabean, M.Si., Mrs. Dr. Dewi Wulandari, M.Si., and Mr. Deo D. Panggabean, M.Si., as Examining Lecturers, who provided many suggestions for improvements so that this thesis could be completed well. Gratitude is also expressed to all the lecturers who have taught and provided knowledge to the author during the lecture period. The Principal, Deputy Head of Curriculum, and Physics Teacher, Mrs. Jelita Sirait, S.Pd., Mr. Obet Agustinus P. Silaban, S.Pd., and Mrs. Rany CFS, S.Pd.,

who are at SMAN 1 Pancur Batu, are also thanked by the author for their help accepted and the freedom given to the author to carry out research at that school.

The author's parents are also deeply appreciated for being always supportive, patient, motivating, and consistently there to provide emotional and material support. The author's beloved siblings Gihring Ransih Jawak, Eno Terdaye Jawak, Novita Elisabeth Jawak, Tiara Jesica Napitupulu, and Jery Martin Napitupulu are also thanked for their motivation. Nia Audina Sitanggang is greatly appreciated as 'My Boo' for the prayers and assistance provided to the author throughout the thesis completion process, from beginning to end, and for teaching and motivating the author. Rp. Apolinaris Vinsensius Tarut CMF is thanked as 'My Bestie' for prayers, reminders, motivation, and both emotional and material support. Two handsome men, friends who share joys and sorrows, namely Agusman Putra Jaya Lagu and Dian Wardana, are also thanked for always inviting the author to campus, accompanying research, and supporting the author in completing this thesis. Nichya Agatha and Febri Gurusinga are honored as older sisters during the lecture period who helped the author. Roby Octavianus Malau is appreciated as a role model and motivator for the author. Dwi Anggraini, Aulia Ramadani, Anugrah Zega, Sylvania Carella, Nurhayati, Kasni Adelwise, Monarisana Napitupulu, Willi Sibarani, Itok Rio, Itok Theo, Cindi Elvani, Nur Aisyah, Eri Santi, members of 'Equilibrium SG', members of 'Kawan Kacau', members of 'Crazy Gurl', and other fellow physics majors of 2017 are also thanked by the author.

Medan, July 24<sup>th</sup> 2024



Noni Prince Jawak  
IDN. 4173121035