## PREFACE

Praise be to God Almighty. The owner and creator of all that is in the heavens and the earth and what is between them. With the blessings of grace, health and patience by God Almighty, finally the author can complete the thesis entitled **"Development of Physics Learning Media Based on Android Using Kodular to Improve Student Learning Outcomes on Temperature and Heat Material at SMA Negeri 5 Medan"** as one of the academic requirements to obtain a bachelor's degree in the Bilingual Physics Education Study Program, Faculty of Mathematics and Natural Sciences, Medan State University.

The preparation of this thesis is inseparable from various obstacles, but thanks to the help, guidance and prayers of various parties so that the author can complete this thesis. Therefore, the author would like to thank:

- Mr Prof. Dr Baharuddin, ST,. M.Pd, as the Rector of Medan State University for the opportunity given to the author to attend undergraduate education at Medan State University.
- 2. Mrs Dr Ani Sutiani, M.Si. as the Dean of the Faculty of Mathematics and Natural Sciences of Medan State University.
- Dr. Jamalum Purba, M.Si. as the Vice Dean for Academic Affairs, Dr. Dewi Wulandari, S. Si., M.Si. as the Vice Dean for Finance and Personnel, and Dr. Rahmatsyah, M.Si. as the Vice Dean for Student Affairs of the Faculty of Mathematics and Natural Sciences, Medan State University.
- Mrs. Dr. Yuni Warty, S.Pd., M.Si. as Head of Physics Department, Mr. Sabani, S.Pd., M.Si. as Head of Physics Education Study Program, and Mrs. Dr. Ely Djulia, M.Pd. as Head of Bilingual Physics Education Study Program.
- 5. Mr Sabani, S.Pd., M.Si. as Academic Supervisor who has provided good academic guidance to the author during the implementation of lectures at Medan State University.

- 6. Mr Drs. Pintor Simamora, M.Si. as Thesis Supervisor who has guided and provided direction, motivation, input, and tremendous support to the author during the research and writing of this thesis.
- Mr Dr. Wawan Bunawan, M.Pd., M.Si., Mr Deo Demonta Panggabean, M.Pd and Mrs Yeni Megalina, S.Pd., M.Si. as examining lecturers who have provided advice and direction to the author so that he can complete this thesis.
- 8. Prof. Dr. Makmur Sirait, M.Si., Prof. Drs. Togi Tampubolon, M.Si., Ph.D., Mr. Muhammad Kadri, S.Si., M.Sc., Ph.D., and Mr. Abdul Rais, S.Pd., S.T., M.Si as expert lecturers of Media and Material validators in this thesis.
- All lecturers of Physics Department who have provided teaching and guidance while attending lectures at the Faculty of Mathematics and Natural Sciences, Medan State University.
- 10. Mrs Supraba Ika Sari, S.Pd., M.Pd., as the Head of SMA Negeri 5 Medan, Mrs Eskaria Sirait, M.Pd., Gr. as the physics teacher who has been kindly helping me during the implementation of research and data collection for writing the thesis.
- 11. I dedicate this thesis entirely to the great person in my life, namely my mum Marintan Gultom. Mama is the one who makes everything possible so that I can get to the stage where this thesis is finally finished. Thank you for all the sacrifices, good advice and prayers that you never stop giving me. I am forever grateful for the existence of mama as my parent.
- 12. Many thanks to my beloved sister named Dwi Kasih Meisania for all the support, prayers, and entertainment so far, and for being the best sister throughout my life.
- 13. My beloved Hamdi Arrayan, S.Pd., thank you for being one of the encouragers, listeners to complaints in writing the thesis, good advisors and always giving love. I am very grateful to the lover who sincerely helped and supported me to continue to struggle to complete this thesis.
- 14. I thank Putri Amalia as my best friend during lectures, while working on the thesis process has helped and accompanied me as the best friend.

- 15. I thank my PESP 2020 classmates who have supported each other and shared experiences during the process of writing this thesis.
- 16. Other parties that the author cannot mention one by one who helped the author in completing this thesis.

Medan, July 17th 2024

Chairin Ghillanda IDN. 4202421018