

ACKNOWLEDGMENTS

I wish to thank Assistant Professor Dr. Naruemon Yutakom, Professor Dr. Vantipa Roadrangka, Assistant Professor Dr. Sudjit Sangaroung and Dr. Bronwen Cowie, for their dedication, encouragement and patience during doing my research. They gave me an opportunity to develop my understanding in science education. I would like to especially thank Ms. Beverly Cooper for her advice, support and all her hard work for me. Special thanks go to the teachers and students who participated in this study. I thank my teachers and my parents for their love and belief in me. Thank you to all my friends for their friendship and support. I also thank all staff in the Faculty of Education, Kasetsart University for their help over the past 10 years.

I would like to express my gratitude to The Institute to Promote Science and Technology Teaching (IPST) for the full scholarship to study in the program to prepare research and development personnel for science education. And, I would like to thank the graduate school, Kasetsart University for research funding to develop this study.

Pattamaporn Pimthong

May 2006