Hamidah Musa 2012: Development of Grade-11 Students' Mental Model in Acid-Base through Model-Based Learning Activities. Master of Education (Science Education), Major Field: Science Education, Department of Education. Thesis Advisor: Mrs. Akarat Sreethunyoo, Ph.D. 209 pages.

The research aimed to explore students' mental model in acid-base through model-based learning activities and guideline of teaching acid-base through model-based learning activities. The research was divided into two phases. In the first phase, a survey research method was used to investigate students' mental model in acid-base. The subjects were 40 grade-12 students, selected by purposive sampling, from a school in Pattani province under Office of the Higher Education Commission (OHEC). The research was conducted during the first semester of 2010 academic year. Data were gathered by using an acid-base mental model test. In the second phase, students' mental model in acid-base and guideline of teaching acid-base through model-based learning activities were investigated. The subjects were 37 grade-11 students in the first semester of 2011 academic year, selected by purposive sampling, from a school in Pattani province under Office of the Higher Education Commission (OHEC). Data were collected by using an Acid-base Mental Model Test, student journal writing, teachers' logs, classroom observations. Data were analyzed by content analysis.

The results in the first phase indicated that the majority of students held partial consistent and inconsistent mental model in the concept of acid–base theories, followed by acid–base titration and properties of acid and base, respectively. For the concepts that most students' mental models were not consistent with scientific models were electrolyte solution, followed by indicator for acid and base. However, the concepts of acid–base theories and acid–base titration were found that no students had consistent mental model with scientific models. The findings in the second phase revealed that learning process through model-based learning activities consist of 5 steps are step of mental model production, emphasize on employing open-ended questions and have demonstration or situation to produce model, step of model expression, encourage student to express ideas by drawing, acting, wording, and using materials, step of testing model, emphasize experiments that encourage student to do hands-on activities, engaging student-student interaction, step of evaluation, emphasize on asking students questions led to discussion, use various learning medias to integrate across three level chemistry content in macroscopic, microscopic and symbolic level and emphasize reviewing the basic concept about acid-base concept that could promote students' mental model of acid-base, and step of elaboration, use developed model to explain new problem or daily situation. Moreover, after participating with activities most of students, about 46.0%, held partial consistent in all concepts except acid-base theories and buffer solution which most of students held only partial consistent and inconsistent mental model.

_____ _____ ___ / ___ / ___

Student's signature Thesis Advisor's signature