Pattamaporn Pimthong 2006: Teaching and Learning About Matter in Grade 6 Classrooms: A Conceptual Change Approach. Doctor of Philosophy (Science Education), Major Field: Science Education, Department of Education. Thesis Advisor: Assistant Professor Naruemon Yutakom, 297 pages.
ISBN 974 - 16 - 2103 -5

The purposes of this study were to develop student conceptions about matter and its properties; including the change in state of matter, solution processes, separation of mixtures and chemical reactions, and to provide primary teachers to teach effectively in matter and its properties. A conceptual change approach-based instructional unit was designed and implemented as an intervention to reach for these purposes.

The surveying of existing situation using concept survey before implementing the instructional unit indicated that most Thai grade 6 students (age 12-13 years) had alternative conceptions about matter. They had difficulties to explain the processes which the changes were unobservable. The students also had confusion between everyday language and scientific language. A particulate nature of matter and conservation of matter ideas are not recognized by Thai students. For surveying of existing situation of Thai primary teachers using individual interviews, they had low confidences in teaching science and doing science. Most teachers said because they had no qualification in science. Three teachers and their grade 6 students from three primary schools in a rural area volunteered to implement the instructional unit. Data from a student pre and post concept survey; classroom observations; student and teacher interviews were analyzed. The student responses were categorized using criteria adapted from research by Andersson (1990) and Tytler (2003). The results showed that the students' alternative conceptions developed into more scientific conceptions. The students were aware of similarities and differences between their conceptions and scientific conceptions and used scientific conceptions in appropriate contexts. For the teachers, data from teacher interviews and classroom observations showed that the instructional unit helped the teachers to develop teaching practices that encouraged students to learn. The findings indicated that the instructional unit was effective in providing teaching situations that contributed to students' conceptual change. The study suggested a need for professional development regarding content knowledge and teaching strategies. The study also suggested the applications of a conceptual change based instructional unit as a tool to promote science teaching and learning that is student-centered and helps students make links to their everyday life as is recommended in the educational reform in Thailand.

Pattamaporn Pimthong — Student's signature

Naruemon Yutakom — Thesis Advisor's signature

7 / 06 / 06