

Theerapong Sangpradit 2009: Enhancing Lower Secondary School Thai Students' Understanding of Light: Social Constructivist Approach. Doctor of Philosophy (Science Education), Major Field: Science Education, Department of Education. Thesis Advisor: Professor Vantipa Roadrangka, Ph.D., Ed.D. 298 pages.

In terms of teaching and learning science, the concept of light is a very important concept. Light is a basic concept that is related to everyday life and is necessary for students' understanding of natural phenomena. Understanding the concept of light will help students to understand more advanced concepts. Numerous studies point to promising ways of understanding students' thinking about light. Moreover, students have many misconceptions about light. In this study, the Light Learning Units (LLU), using a social constructivist approach, were developed to enhance students' understanding of light.

The study was divided into three phases: Exploration, Development, and Implementation and Evaluation. In the first phase, thirty seven eighth grade science teachers in schools under the Bangkok Metropolitan Administration (BMA) were surveyed about the current state of teaching and learning the concept of light. Three of them were selected to be interviewed in-depth. Moreover, the students of the three selected teachers were asked to assess the Light Diagnostic Test (LDT). The findings from phase I were used to guide the development of the LLU in the second phase. In the third phase, three teachers from phase I were asked to implement the LLU. The effects of the implementation of the LLU on teachers' teaching and students' learning were investigated. Multiple data gathering methods were used to ensure the trustworthiness of the findings. The multiple data gathering methods included classroom observations with videotape recording, field notes, semi-structured interviews, and the students' reflections.

The findings indicated that the three teachers implemented the LLU differently because the teachers were different in terms of teaching style and their content knowledge. Two teachers implemented the LLU by focusing on students' prior knowledge, using a meaningful context to help students' development of the concepts in the real world, encouraging students by asking them thoughtful and open-ended questions, giving the students an opportunity to construct their own learning through interaction with their peers, and focusing on the students' cooperative work. These strategies developed teachers' content knowledge and teaching strategies. All of the teachers were happy with their teaching and felt that the LLU had helped their students to enjoy doing the activities in the LLU. In addition, the students paid more attention during the lessons, and the unit enhanced the students' understanding of the concept of light. However, some students still had misconceptions about some concepts of light.

---

Student's signature

---

Thesis Advisor's signature