

Siriwan Chatmaneeungcharoen 2011: Enhancing Elementary Science Teachers' Pedagogical Content Knowledge through a Co-Teaching Model. Doctor of Philosophy (Science Education), Major Field: Science Education, Department of Education. Thesis Advisor: Assistant Professor Naruemon Yutakom, Ph.D. 411 pages.

Pedagogical Content Knowledge [PCK] is essential to career development for teachers. Competencies that science teachers must master represent the blending of content and pedagogy which should result in increased understanding for students. Therefore, the purpose of the study is to enhance elementary science teachers' pedagogical content knowledge through a Co-Teaching Model [CTM]. In addition, the researcher aims to develop the effective characteristics of co-teaching model supporting science teachers' changes to their PCK. Three volunteer science teachers in grade 4-6 at the same school participated in this study for 1 year. A CTM was used as a professional development [PD] program. Data sources throughout the research project consisted of classroom observations, individual interviews, questionnaires and document analysis. Inductive analysis was used to analyze the data into more general outcomes in which were presented in three case studies and a cross-case analysis.

Findings indicate that before the three teachers were engaged with CTM they experienced some problems regarding: articulating the purposes for teaching science, designing appropriate instructional and assessment activities, understanding the science content, and how their students approached the learning of the science content in the curriculum reform. Even though the three teachers realized that many aspects of their teaching practice needed to be altered to address the curriculum reform in science teaching, the areas of greatest need were to develop a better understanding of articulating the purposes for teaching science, the curriculum content and broaden their teaching approaches. After the three teachers participated in CTM, the results showed that their performances in developing PCK, as assessed by the design of their inquiry-based lesson plans and as observed in their classroom practices, shifted from teacher-centered to student-centered teaching and learning practices. The sustained production of inquiry-based lesson plans and practices demonstrates that teachers gradually accepted the CTM as method of PCK development. They changed their understandings and practices about subject matter knowledge, pedagogical knowledge and knowledge of context gradually. Evidence from this study indicates that the incorporation of the CTM within a professional development program is useful for promoting the teachers' understandings and practices of PCK in classroom settings. Further, this study found that the main factor affecting teacher's development of their PCK was institutional support. The implication of this study are that institutions responsible for producing and developing science teacher should create and provide a long-term PD program for enhancing the teacher's PCK by encouraging them to share, discuss, and reflect their knowledge. The present study did not focus on the role of administrator; therefore, further research is needed to understand how school and district administrators can promote effective PD program for elementary science teachers.

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Student's signature

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Thesis Advisor's signature