

Ladapa Suttakun 2011: Enhancing Thai Elementary Teachers' Understanding of Nature of Science and Teaching Practice Reflecting Nature of Science through Collaborative Action Research. Doctor of Philosophy (Science Education), Major Field: Science Education, Department of Education. Thesis Advisor: Assistant Professor Naruemon Yutakom, Ph.D. 229 pages.

This interpretative case study examined elementary teachers' understandings of nature of science (NOS) as well as their ability to explicitly teach NOS through collaborative action research (CAR). It involved three Thai elementary teachers, who taught science at different grade levels in a government public school. Initially, the teachers' understandings of NOS and how they taught NOS in the classroom were explored using a questionnaire, individual semi-structured interviews and extended classroom observations, and then analyzed using content analysis. A workshop was then held to introduce the teachers to contemporary views of NOS before they attempted to translate particular aspects of NOS into classroom practice. To promote collaborative and reflective discourse, the researcher and teachers met regularly and engaged together in CAR. The researcher facilitated group meetings and provided advice and support to help the teachers learn about NOS and how to introduce NOS in their classrooms. A variety of qualitative data collection methods including teacher interviews, classroom observations, group discussions during CAR, teacher journal entries, the researcher's field notes and a collection of other relevant materials were used to examine how CAR supported the teachers' learning about teaching NOS. The data were analyzed using a constant comparative method.

The findings indicated that none of the teachers came into the study with complete understandings of NOS or methods for teaching NOS. None of them explicitly taught NOS in the classroom although they claimed to do so. However, two of the teachers implemented an implicit approach to teaching NOS through engaging students in hands-on or inquiry-based activities. The results of the study indicated that participation in CAR afforded varied supports to the teachers learning to teach NOS. Discussions and activities during collaborative group meetings provided teachers with opportunities that affirmed their tacit understandings of NOS, challenged their problematic understandings of NOS, and helped them reinterpret what is meant by teaching NOS effectively. Involvement in the CAR process also helped the teachers decide what NOS aspects are attainable by students, helped them see possible ways to translate those NOS aspects into classroom practice, and promoted their reflection on their efforts with NOS instruction.

This study found that significant components of Bell and Gilbert's (1994) model of teacher development were intrinsic to the CAR process, specifically personal development, social development, and professional development. It also suggested that the teachers needed continued support to develop pedagogical content knowledge (PCK) for teaching NOS.

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