Tepkanya Promkatkeaw 2007: A Development of Program for Primary School Teachers on Nature of Science Instruction. Doctor of Philosophy (Science Education), Major Field: Science Education, Department of Education. Thesis Advisor: Mrs. Sunan Sung-Ong, Ph.D. 341 pages.

This two-year empirical research project explores four non-science lower primary school teachers' understanding of the Nature of Science (NOS) both in conceptions and instructional approaches and their teaching practices in Science. The NOS refers to the values and assumptions inherent in science, scientific knowledge, and the development of scientific knowledge. Teachers with appropriate understanding of the NOS and NOS instructional approaches teach Science more effectively and attend to developing students' scientific literacy. Based in the interpretist paradigm and using case study methods, the journeys of the participant teachers are described. The first exploratory year (2004) examines teachers' existing NOS understanding and teaching practices by employing semi-structured interviews, the NOSI Questionnaire, documentary and content analysis, and classroom observation. The second year (2005) traces the impact of an in-service primary school teacher professional development program on the teachers' instruction of NOS by employing the same sets of research instruments. The program was aimed at enhancing their understandings and teaching of the NOS. The impact of the training program, which was based on explicit approaches for the NOS instruction and social constructivist approaches for teacher development, is examined.

Findings from the first year reveal that teachers' views of the NOS ranged between traditional and contemporary. They did not recognize or appreciate the need to understand the NOS as a cognitive learning outcome that required explicit teaching and assessment. Rather, they used the implicit approach for teaching the NOS with an emphasis on studying scientific concepts and less emphasis on doing scientific activities. Findings from the second year following the professional development program revealed that the use of explicit approaches for the NOS instruction and employing a teacher development program based on social constructivist perspectives exerted considerable influence on teachers' understanding of the NOS instruction. The collaborative learning activities, opportunities for discussion, explicit reflection on their current understandings of the NOS concepts and instruction, and opportunities to undertake practical activities enhanced teachers' learning and understanding. Overall, teachers had more contemporary views of NOS. They appreciated the need to understand the NOS as an objective of Science teaching. They used more practical activities related to science processes in their Science teaching. Most of them appreciated the importance, and the use, of explicit instructional approaches relevant to the NOS. This study provides empirical evidence that when teachers are involved in a teacher development program based on social constructivist perspectives and focusing on explicit approaches for the NOS instruction, their understandings of NOS concepts are enhanced and they develop an appreciation of teaching the NOS in Science classes.

Tepkanya Promkatkeaw — Student's signature

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