

Jeerawan Ketsing 2010: Enhancement of Inquiry-Based Instruction of Thai Secondary Science Teachers Using Collaborative Action Research. Doctor of Philosophy (Science Education), Major Field: Science Education, Department of Education. Thesis Advisor: Professor Vantipa Roadrangka, Ph.D., Ed.D. 281 pages.

This interpretive case study aimed to examine the changes of three science teachers' understandings and practices of inquiry-based instruction (IBI) as a result of their participations in the professional development program, entitled the collaborative action research program (CAR Program).

The study and the CAR Program were composed of four phases: Preparation, CAR Cycle I, CAR Cycle II, and CAR Cycle III. In the Preparation phase, the teachers' initial understandings and existing practices with regard to IBI were investigated. The findings from this phase were used for comparing and contrasting with the results of individual teacher's understandings and practices in the following three phases. During each phase, the teachers were involved in a similar set of activities consisting of designing, implementing, observing, and reflecting on their own inquiry-based lessons. The teachers then presented their lesson plans and teaching experiences for discussion with the other participating teachers in a series of group meetings that were part of the CAR Program. The findings of this study were obtained from multiple data sources including individual interviews, teachers' lesson plans, teachers' written reflections, classroom observations and group meetings. The data were analyzed by using a within-case analysis and followed by a cross-case analysis.

The results demonstrated an improvement of teachers' understandings and practices of IBI after attending the professional development program. In addition, the teachers' understandings and practices shifted from focusing on teacher-directed inquiry to learner-directed inquiry. All three teachers fully understood and practiced student-directed inquiry in terms of the role of a teacher, the role of students, and the instructional objective. For the instructional process, these three teachers conceived and incorporated most of the key features of IBI into their practices. As a result, the professional development program established in this study was seen to be effective in promoting three teacher's understandings and practices of IBI.

The results of this study indicate that the incorporation of the basic elements of collaborative action research within a professional development program is useful for promoting the teachers' understandings and practices of IBI in classroom settings. The present study did not investigate the process the teachers come to understand and change their practice, therefore, further research is needed to understand more fully how science teachers learn to adapt and whether they sustain their new understandings and practices of IBI in the context of professional development activity.

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Student's signature

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Thesis Advisor's signature