

Aungkana Pattamapongsa 2012: The Development of High School Student's Conception of Photosynthesis and Views of Nature of Science Using Inquiry – Based/ Explicit NOS Approach. Master of Education (Science Education), Major Field: Science Education, Department of Education. Thesis Advisor: Assistant Professor Pongprapan Pongsophon, Ph.D. 295 pages.

This research aimed to 1) develop high school students' conception of photosynthesis and views of nature of science by using inquiry – based/ explicit NOS approach and to 2) study and propose an effective way of implementing this instructional approach based on practical knowledge and critical reflection. Research design is a classroom action research. The participants were a classroom of grade 11 students (N=48) from a high school in Bangkok. The research tools consisted of: nine lesson plans (16 periods), Photosynthesis Concept Test, Views of Nature of Science questionnaire, teacher reflective journals, classroom observation for a peer teacher, student journals and work sheets. Student's written responses in respect to photosynthesis and nature of science were thoroughly read and categorized into five and four groups, respectively based on degree of congruence with expected answers. To determine the success of the approach initially, frequencies and percentages of each group before and after the intervention were compared. Then, the total scores of an individual student over pre and post intervention are calculated and evaluated using 60 percent criteria for posttest. Relative gain scores were also worked out to determine the extent of change in their ideas. To synthesize the best practice, the critical points in student journals, teacher reflective journals and peer teacher's observational data were identified and generalized using inductive analysis.

The findings indicated that inquiry – based/ explicit NOS approach can improve all concepts of photosynthesis, with average posttest score exceeded the criteria at 69.00% and the high level of relative gain score at 60.49 %. Concerning the views of nature of science, the students moved towards the informed views in all aspects. However, they demonstrated little improvement in “myth of scientific method”. The average posttest score exceeded the criteria at 68.27% with the moderate level of relative gain score at 33.09%. The researcher as a practitioner provided suggestions and tips in teaching “science” and “about science” by this approach in great details in the report using Photosynthesis Learning Unit as an example based on theoretical and practical knowledge for the sake of science teachers.

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Thesis Advisor's signature