Pichaya Sitthichai 2015: Action Research Study for Developing 11th Graders' Scientific Concepts of Nervous System through Inquiry-based Learning and Visualization Media. Master of Education (Science Education), Major Field: Science Education, Department of Education. Thesis Advisor: Assistant Professor Jeerawan Ketsing, Ph.D. 131 pages.

This research aimed to: 1) study the impact of inquiry-based learning and visualization media on 11 graders' nervous system concepts and 2) find out the approaches of this pedagogical method that could promote the students' scientific concepts. The participants were 39 eleven graders in a well-known public girl school in Bangkok, academic year 2014. In addressing the first objective, the data was obtained from an open-ended questionnaire. It was then analyzed by classifying it into 5 categories. Percentage and frequency of each category was calculated. In answering the second objective, the data was collected from teacher's journal, school mentor's feedbacks, and videos of the instructions. The data was analyzed via inductive analysis.

The results revealed that after learning the concepts through the inquiry-based learning and visualization media, most of the students fell into the sound understanding category and the partial understanding category, especially in the concepts of 'unicellular responses', 'neurotransmission within nerve cell', 'the transmission of nerve impulse between neurons', 'structure and function of spinal cord', and 'somatic and autonomic nervous systems', respectively. However, many students were still in the partial understanding with specific misconception category, particularly in the concepts of 'structure and function of the brain', 'responses of multicellular organisms', and 'neurotransmission within nerve cells', respectively. In addition, this study found a number of approaches that biology teachers could use to promoting scientific concepts, for instance, 1) the use of color static visualization and dynamic visualization with questions for motivation of students' interest; 2) the use of static visualization and dynamic visualization as a source of data for data analysis and interpretation; 3) the use of visualization media to stimulate the whole class discussion and conclusion; 4) the use of the same visualization media and questions used during the lesson introduction for assessing the students' learning in the end of the lesson.

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