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ABSTRACT

The study developed a set of Eco-inquiry modules (also known as Eco-inquiry) and determined its effects on students' achievement, understanding of environmental concepts and the nature of science among undergraduate tourism major students. Eco-inquiry was evaluated in terms of subject matter and pedagogical experts' assessment and readability. Using quasi-experimental pretest-posttest control group design for quantitative and qualitative data analyses, the following problems were addressed: (1) correlation between the pre and post-test scores in the achievement test and students' grades in their prerequisite subjects, (2) difference in the scores for the achievement test, understanding of environmental concepts and the natures of science among and between students exposed to inquiry-based learning and those exposed to conventional approach, (3) correlation between the experimental students' inquiry-based learning posttest scores in the achievement test and conceptual understanding of environmental concepts and (4) students' assessment of inquiry-based learning through Eco-inquiry. Tourism major students from a College in Manila, the Philippines who were enrolled in Ecotourism (ECOTOUR) class for the 3rd Term of Academic Year 2014-2015 were the subjects of the study. The assignment of two sections to either experimental (use of inquiry-based learning) or the control (use of conventional approach) group was randomly done through a drawing of lots. All parametric and nonparametric statistical tests were processed using the Statistical Package for Social Sciences (SPSS Version 21) software for MS Windows.

Results in all criteria for evaluation of Eco-inquiry which include attainment of objectives, characteristics as inquiry-based learning, integration of the nature of science, content accuracy, modules originality, modules clarity and evaluation indicators by the subject matter and pedagogical experts showed that it is nearly outstanding. Subsequently, the readability index of Eco-inquiry is found to be appropriate for college level.

There was no positive correlation between the pre and post-test scores in the achievement test and students' grades in their prerequisite subjects. Students exposed to inquiry-based learning performed better significantly in the achievement test than those exposed to conventional teaching. Likewise, conceptual understanding of environmental concepts through concept mapping of students exposed to inquiry-based learning was significantly better than those exposes to conventional teaching. Moreover, verification of concept maps made by students using propositional complexity revealed that those exposed to inquiry-based learning had a higher pretest-posttest percent difference than those in the conventional group. The examination of graphical sophistication revealed that there was a notable shift from simple to network type of concept map for students who were exposed to inquiry-based learning. However, there was no correlation between the experimental group's posttest scores in the

achievement test and that of conceptual understanding of environmental concepts through concept maps.

Similarly, understanding of the nature of science through Student Understanding of Science and Scientific Inquiry (SUSI) of students exposed to inquiry-based learning was significantly better than those exposed to conventional teaching. In particular, there is significant difference in the experimental group's pretest and posttest mean scores in the understanding of social and cultural embeddedness and creativity and imagination as essential elements of the nature of science through Likert-scale and constructed response.

The experimental groups; evaluation of Eco-inquiry as learner-centered instruction materials for ECOTOUR showed that for cognitive domain, students learned topics pertaining to environmental issues, environmental protection and tourism impact while for affective domain, professionalism got the highest mark. Observations by two faculty members from the College on the implementation of the inquiry-based learning through Eco-inquiry in the experimental group showed that the faculty in-charge's planning and preparation, classroom management, classroom instruction and professionalism had a verbal rating of outstanding.

Qualitatively, the faculty raters commented that the faculty in charge encouraged and commended students to come up with their own creative works and designs. Equally, it was observed that students were encouraged to comment, ask questions and provide feedback after every group presentation. With the exposure to the learner-centered, inquiry-based learning tool, all the mean scores from the experimental group showed equal or higher value as compared to the control group in terms of all the criteria for the College's learner-centered practices.

The study recommends that inquiry-based learning as a learner-centered pedagogical approach be integrated with conventional teaching approach and menu-type guided approach in scientific investigations as this will exemplify how professional scientists work in generating and validating scientific knowledge. As tourism education is multidisciplinary, teachers should design scientific investigations that implicitly or explicitly address and incorporate aspects of the nature of science (NOS) and environmental concepts where applicable. Administrators should lead and organize trainings, seminars and workshops in inquiry-based strategies integrated with NOS. As the outcome of inquiry-based learning is multifaceted academically and non-academically, it is encouraged that future research include variables such as literacy skills, scientific skills, attitude towards a certain concept or discipline, inquiry skills and higher-order thinking skills.