A Firefly Learning Module for Environmental Sustainable Development in Samutsongkhram Province, Thailand

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Abstract
A firefly learning module for the sustainable development was developed for Thai secondary school students in the study province. A deeper connection between environment, social and economic dimensions, which lies at the core of sustainability, became the key issue for this learning module. Also an important dimension of the module was the empowerment of the students themselves. Through brainstorming and ensuring activities, students were expected to act at the local level and to develop a deeper sense of responsibility. This study aimed at to develop learning module based on both the principle of inquiry approaches and the collaboration of a community of learners. Mixed methods paradigm was employed for data collection and analysis. Four data collection techniques: classroom observations, interviews, written documents, and questionnaire were employed. The Statistical Package for the Social Sciences was applied for quantitative data analysis. The qualitative data were analyzed using open and axial coding techniques. The analyzed data were categorized to describe context of developed learning module, the students’ conceptual understanding, and awareness toward ecosystems and firefly conservation. The study involved one-9th grade class of twenty students from one school in Samutsongkhram Province, Thailand. The results indicated that the developed learning module improved students’ conceptual understanding, perceptions, and self-reported behavior toward ecosystems and firefly conservation. The results of the effectiveness of this learning module clearly showed that the students gained significantly higher score in conceptual understanding and perceptions after participating in this learning module. The results from interviews showed that the students changed from a poor to a very good level of understanding after involvement in this learning module. The results also indicated that none of the students remained at the poor level after participating in this learning module. Students’ perspective toward the developed learning module revealed that most students were happy with the several educational activities and multi-tasks of the module. The results from teachers’ interviews showed that all of them had positive attitudes about the learning module.

Keywords: Learning module, firefly, sustainable development, K-12 environmental education, mixed-method, sense of responsibility

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