

A Design of Environmental Education for Secondary School Teachers

Hidayatullah, Kheryadi

Department of Islamic Religious Education, Graduate school, Universitas Islam Negeri Sultan Maulana Hasanuddin Banten, Indonesia

Department of English Education, Faculty of Teacher Training, Universitas Islam Negeri Sultan Maulana Hasanuddin Banten, Indonesia

e-mail: hidayatullah@uinbanten.ac.id, kheryadi@uinbanten.ac.id

Submitted: 04-03-2020

Revised: 29-05-2020

Accepted: 29-05-2020

ABSTRACT. The goal of this research was to establish an environmental education (EE) skills development program for secondary school teachers, which was carried out using qualitative approaches. The data were collected from the questionnaire and a formal interview with the experts. Results of this study showed some environmental awareness, basic understanding of EE, responsibility for EE instructor updating, EE preparation and service, support for EE learning, and EE assessment. The EE development was produced to cultivate educators out of a variety of subjects to carry out interoperable learning in order to improve the environment of students before preserving or resolving society environmental issues. This systematically consisted of 5 steps including: analyzing the environmental policy covering national, educational area, and school policies; studying the community environmental problem; designing the environmental learning project; identifying the learning standard; and performing the integrated lesson plan. Authentic assessment has confirmed the efficiency of innovation, both internal and external skills.

Keywords: *Environmental Education, Integrated Multidisciplinary Education, Educator Development.*



<https://dx.doi.org/10.32678/tarbawi.v6i01.2512>

How to Cite Hidayatullah, H., & Kheryadi, K. (2020). A Design of Environmental Education for Secondary School Teacher. *Tarbawi: Jurnal Keilmuan Manajemen Pendidikan*, 6(01), 81-90. doi:10.32678/tarbawi.v6i01.2512

INTRODUCTION

Environmental education requires programs that lack consistent guidelines and procedures. Through translating environmental education in schools, the issue of environmental education in schools has been related to "teachers" as teachers have developed classrooms through learning plans (Wanchana, Y., et al., 2019). Nevertheless, EE teachers will be working as members of the classroom facilitator. Furthermore, the positive growth of the EE process meant that "all school staff would recognize the importance of engaging with the community" and looked at the implementation of learning practices in the EE to integrate the community with the school. The cycle of ingraining a better awareness of children's issues was most successful not only in classrooms, but also in the community. This has culminated in practical and continuing sustainability growth and the mitigation to environmental issues in the region.

Worldwide academics also placed forward two guiding principles for teaching environmental learning, which has provided students with an understanding of the role of natural and environmental processes and the effects of human activities. Wanchana, Y., et. al (2019) argued that Learning in the field was designed to provide students with realistic experience in nature and to incorporate all learning materials into the environment.

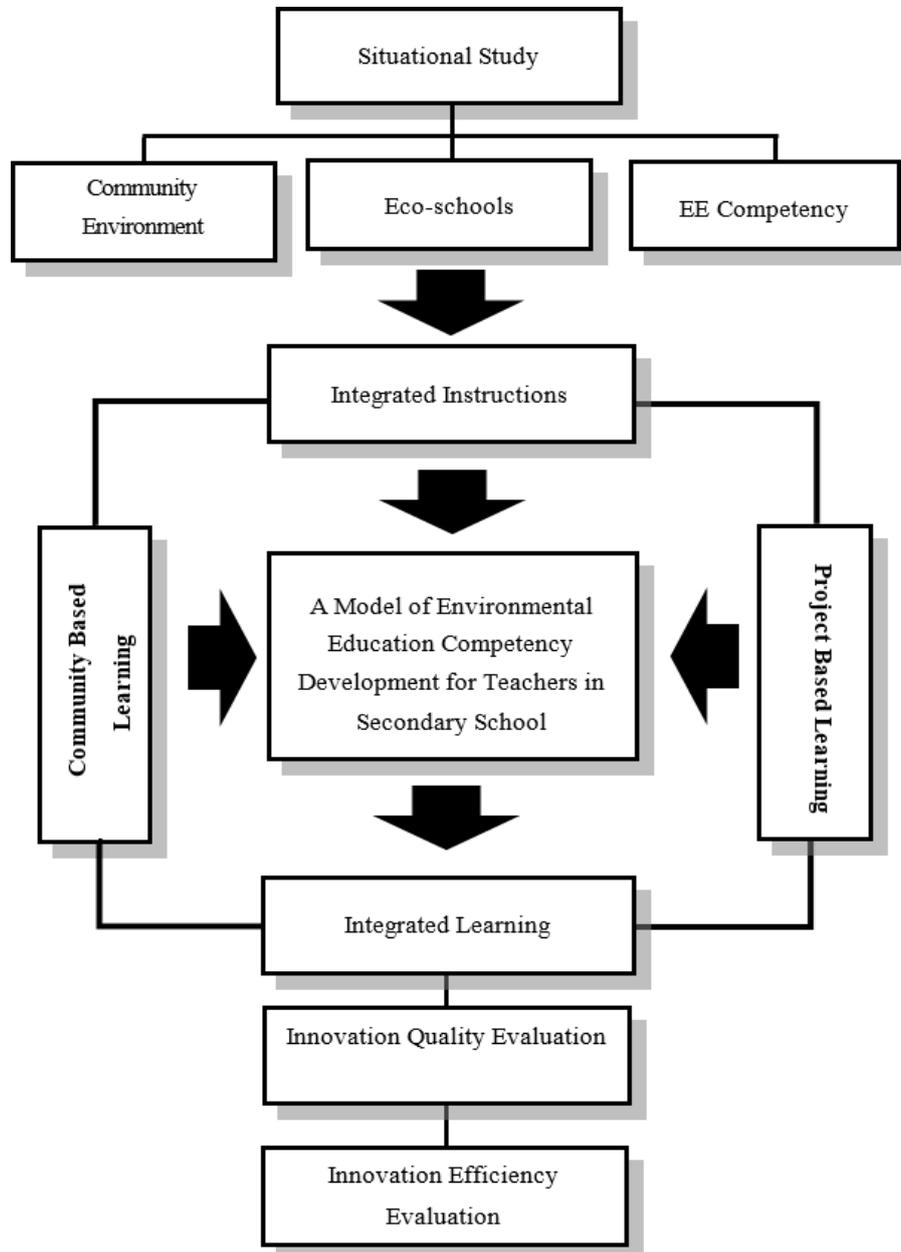


Figure 1: Adopted from Wanchana Research Conceptual Framework

Wanchana, Y., et. al (2019) also stated The core competencies for graduate students in the teaching career of the EE have been described as six program growth achievements: environmental awareness, basic EE, teacher duties, planning and service, promotion of EE, and assessment and evaluation of EE. As a culmination of the issues that led to the study, it was noticed that teachers served an significant role in the EE in schools and required further training.

Thus it is important to create a curriculum for the learning of skills or suitable skills of EE teachers in order to be transparent and to improve the capacity of teachers to promote implementation or to provide students with appropriate skills.

The principal objective of this study was to create a model of EE competence adopted from Wanchana, Y., et. al (2019) for secondary school teachers with three main objectives: to evaluate the environmental performance of secondary school teachers, to metabolize a model of EE development for secondary school teachers, and to assess the consistency and effectiveness of the EE development for secondary school teachers.

Combining the content of subjects in the same class, using research exercises to solve problems in appropriate situations. Hopkins (1973) classifies that encourage students to learn or study in the field of interest through cooperation with students and teachers. The features of the integrated program had to provide ample time for students to study and think about their varied interest. The Autonomous Study of Remedial Education was the basic knowledge for students under the guidance of the teacher and allowed teachers to explore the talents and desires of the students who gave them the opportunity to improve their skills. Blisshen (1969) argued that the integrated curriculum centered on the essence of the various subjects and skills together. It highlighted the partnership. It highlighted the relationship between the notion, material and skill sets of each subject (Fogarty, 2002; Fogarty and Stoehr; 1995). As a result, this model of EA competency for secondary school teachers culminated in three concepts: multidisciplinary education, community-based learning (CBL) and project-based learning.

METHOD

The formulation of the EE model of competence for secondary school teachers used research and development (R&D) to synthesize new environmental strategies for secondary school teachers. For evaluating the efficiency of the new approach, an Innovation Quality Evaluation Form was used to collate the data for quality assessment of these innovations from the experts in experimental design by training the 25 teachers from eight learning areas on process of the model, and authentic assessment records were used to collect the data from teachers, consisting of observation, interviews, and evaluation of their works.

RESULT AND DISCUSSIONS

Result

Studying Latest EE Teachers ' Competence in Secondary Schools

The most informants can apply them to accord with EE issues. They select the sources of EE, which are correct and reliable source learning; they have the relationship which is human, education. They have the knowledge and understanding about the historical areas of biology and local culture, followed by a variety of biological issues, biological change by their planning and management that link to the civil rights and the responsibility. A subsequent approach was produced with regards to environmental issues, then they researched and valuated to the various choices for solving problems respectively.

The most informants understood the goal, objectives, and the basis for EE, followed by knowing about the departments/ organizations which manage in the study of EE. They explain the current state of EE, respectively. Accordingly, the total averages for EE competency levels of basic knowledge in EE were moderate.

The most informants use the teaching method which determines real practice, then determines teaching, materials and instruction media to promote the learners to get the point of view. New views are supporting their beliefs and a self-assessment to create a plans/ activities for their professional development in the past, present and future. Following their explanations and examples comparing the

difference between propaganda and education, they respectfully presented the academic work in committee meetings for a variety of activities and communication with the local community that link inquiry-based approaches to the academic standard of province level and national level respectively.

The research findings revealed that ten aspects of levels of competency for secondary school teachers in the plan and practical EE were different. Most informants support and promote the effort of EE teachers, and choose the appropriate technologies and instruments for teaching with learning. They use the appropriate EE with teaching methods for natural subjects, and choose the instrumental media from community, organization, professional training curriculum development, and/ or internet for the learners appropriately and consistently. They analyze the environmental problems of the learners and use the contents of teaching methods appropriately, and they understand the concept of content knowledge and skills including to the order of learners' development and the consistency skills with the curriculum, followed by the integration of EE subjects to link with main curriculum, sub-curriculum, and the school missions. Subsequently they provide the field experience to link the contents with learner's environment, and make appropriate teaching methods consistent with the variety of the learners in consideration of the various differences of background in culture, social economy, age and educational level, special needs, developmental abilities. This leads to life-long learning of the learners respectively.

Research in EE competency in the promotion of EE learning. Most informants take advantage of an appropriate time to teach by being flexible and open-minded in asking and answering questions of the learners, then they succeed in inducing them to learn and provide investigative experience for the learner's development appropriately. They succeed in stimulating and promoting interest in the environment among learners respectively.

EE competency in the evaluation of EE. Most informants apply the evaluation to improve teaching. They use the evaluation to determine the teaching methods that followed by the basis environment by using at least two tools to evaluate the knowledge, emotions and skills. This are consistent with the teaching objectives for the method to determine the learner's expectation for learning and evaluating on their own, then, they use the methods of the assessment for planning, the methods of using the assessment during the curriculum to improve the EE curriculum.

In addition, the results of the interviews, it could be the supporting data for model developing, which could be summarized in four items as:

Problem situation and the limitations on the activities/ EE projects in schools, which were the EE for sustainable development. The environmental policy and structural management as a mission. This was relevant with school administrators of determination in policy, vision, and clear EE management structure to lead to practice in the schools and community. The researcher had observed that many EE schools for sustainable development could not operate in accordance with the policy of EE schools for sustainable development, because the school administrators lacked the understanding of EE. Therefore, it was policy change management, which did not provide for the EE management in schools. The learning process was focused on teacher development and promoting in various EE learning by focusing on learning management. This was linked to the issues of natural resources and environmental local based on the concept of process learning "ABOUT" learning environment "IN" environment and learning "FOR" by using problem-based learning instead of coaching. The researcher had observed that teachers did not understand the goals of EE, which focused on developing citizens for sustainable development, so it was needed for promotion for the competency of Social teachers. This could allow the teachers to provide the EE activities without feeling that EE activities where the load of the work of learning management. Natural and environmental management in schools was promoting the idea of outdoor teaching instead of traditional classroom teaching. This was done by using the resource center in schools and communities. But still most activities were done in classrooms.

Participation and networking of EE would provide the opportunities for parents, communities, and other departments or various organizations participate and support in the school management, built the learning resources within the school by focusing on the participation.

Factors of the promoting EE in schools. The teachers must know their own communities to be able to use the benefits that the local community can provide. This can, again, give the teacher an advantage when it comes to teaching geography, climate, ecological characteristics impact of the area. The school administrators must promote and support for curriculum development that it has to be flexible and consistent with school policy. This was done in cooperation between the administrators and teachers. They had to do a SWOT together to analyze the strengths and weaknesses of the school, such as the school was distinctive point in the environment. Thus, the direction of a school's policy must promote and support the students to have the moral based on sufficiency economy philosophy through the EE process, etc.

Important contents of promoting competency for secondary school teachers in EE that needs to be successful in the integrated environmental curriculum. All teachers, administrators, and supervisors needs to meet to address and solve problematic topics.

Therefore, the curriculum development based on the PDCA (Plan-Do- Check-Act) process to begin the stages to create the curriculum learning. This will make sure that the process is flexible and changeable.

Important components of competency in secondary school teacher's development. It was important for teachers who were interested in the environment to understand and EE integrated into learning activities in accordance with the standards of the Office of National Education Standards. Teachers must know the seven stages of EE: choose a situation or a learning issue, provide a knowledge base, analyze the link relationship, study the options and make various choices, planning design, training and practice, and share experience Community-based learning is the knowledge about local community, geography, climate, ecological characteristics and ecology of the area, using the benefit of resources in the ecology, and the impact of the problem in the community. Problem-based learning is the knowledge about the problems of communities and use these problems to set up learning programs for children. This was done by following a plan that made the children do tasks to solve problems. If the task was completed in full, it was defined as a success. Introduction of EE into the various subjects raised the students interest to learn. This is due to the process and flexible approach to the learners. Thus, learning management must be flexible for the learners to learn the different topics and solve the problem themselves. The learners would be test without knowing and teachers would test the learners by authentic assessment.

Discussions

Hydrolyzing the EE Competence Development Model for Teachers in Secondary Schools

The EE competency development for secondary school teachers' model was an educational innovation that was created by three concepts, which consists of: multidisciplinary instruction learning, community-based learning, and project-based learning. The main objective was directed to the development of various teachers to have the ability to manage integrated learning environment for the students. This focused on the conscious mind in the environment, with a feeling of love for the environment before environmental conservation in their appropriate communities and their and wisdom. It consisted of five steps.

Step 1 Analyzing the educational policy was aimed to provide the teachers who teach various subjects to have directed understanding of with national education policy, educational area level, and school.

Steps 2 Studying the community environmental problems were aimed to provide the teachers and students with knowledge and directed understanding of the environmental problems which was currently the facing in the community by the concept of community-based learning.

Step 3 Designing the environmental learning project was aimed to provide the teachers and students to lead the environmental problems in the community to write the projects and let the problems to project based learning.

Step 4 Identifying the Standard of learning. This was aimed to give the teachers and students the confidence that the integrated learning about project-based learning and community - based learning were the learning management with the educational standards within learning areas and educational policy. This was a concern in school, educational area level, and on national level.

Step 5 Performing the integrated lesson plan. The topic was aimed to allow the teachers to apply their knowledge and understanding of integrated interdisciplinary learning to write the integrated lesson plan. There was a mix between the content of the subjects and the EE before the learning to manage the students in the next step.

In conclusion, the process of EE competency development for teachers in secondary school, would give the target audience, who were the teacher that teaches various subjects at the secondary level, to have a systematic EE competency before integrating learning management for students with the concept of multidisciplinary instruction through project - based learning to lead to management or to solve the environmental problems in the sustainable community continuously.

Innovation quality evaluation, which means the construct validity and content validity of a model by educational experts in EE and three evaluators by using the index of congruence (IOC). This consists of content validity, construct validity, multidisciplinary instruction, community based learning, and project - based learning by educational experts in EE and evaluators.

Content validity consisted of seven items as: analyzing the educational policy, studying the community environmental problems, designing the environmental learning project, identifying the content indicators, performing the integrated lesson plan, integrated learning process, and integrated learning, which reveal IOC was 1.0.

Construct validity consisted of five items as: study the environment in the community before taking the problems as the learning issues, meet teachers in various learning areas for determining the problems issues and learning issues, give the independence to each teacher who teaches in each learning areas to make decision about what they teach and how to teach for according with the natural subject which they respond and to achieve the aims in EE, report the learning management in teachers meeting, and evaluate the integrated learning in teachers meeting, which reveal IOC was 1.0.

Multidisciplinary instruction consisted of five items as: study the environment in the community before taking the problems as the learning issues, meet teachers in various learning areas for determining the problems issues and learning issues, give the independence to each teacher who teaches in each learning areas to make decision about what they teach and how to teach for according with the natural subject which they respond and to achieve the aims in EE, report the learning management in teachers meeting, and evaluate the integrated learning in teachers meeting, which reveal IOC was 1.0.

Community-based learning consisted of five items as: study the environment in the community before taking the problems as the learning issues, consider the learning management before using for community benefit, realize in the important concept of their beloved hometown,

give the importance with local wisdom, and evaluate in Authentic assessment, which reveal IOC was 1.0.

Project-based learning consisted of five items as: write the project before learning management, determine the project of objective clearly, determine the management clearly, have the integration between learning with the practice in the community, and evaluate the cover for personal behavior level and the benefit of the public in the community, which reveal IOC was 1.0.

In addition, the model was evaluated for innovation efficiency. This was done by the examination of the possibility for using real practice of the concept of authentic assessment with 30 secondary school teachers. This consists of internal behaviors, external behaviors, analyzing the educational policy, community-based learning, designing the learning project, identifying the standard of learning, and performing the integrated lesson plan.

Internal behaviors. The researcher has interviewed the participating teachers before training workshop in EE competency development for teachers in secondary schools. This revealed that the teachers lacked the knowledge of EE and refuse to support the students to have environmental awareness, according to believe that only Science teachers could manage the learning activities for the students because the learning content was defined in the Basic Education Core Curriculum 2008. After the teachers have been training workshops, they had the understanding of the objectives of EE and could integrate EE into their students learning activities and respond to the educational policy. In addition, the most teachers had the same opinion to use the community, where it should be a source of learning by starting from community in schools and extending to outside.

During the activities, review of the practice according to the educational policy, the teachers who were assigned in each academic year. They could identify the characteristics and performance of students in “Tree Model” that consisted of roots, trunks, and branches. The components of the tree where the various activities that teachers provide to students in the educational policies of the government, which must be many repeating activities. The researcher had reviewed that teacher’s behavior after creating a comparison table of the relationship project. The questions in the table were repeated objectives and the concept of the various activity management could reduce the workload and the time for student’s activities. After interviewing the teacher from the presentation of work, they were expected the school administrators to analyze and reduce the repeating activities for students and teachers to be happy with the learning activities.

External behaviors. The teachers could create the base on EE into multidisciplinary instruction, community based learning, and project based learning. This respond to educational policies, and are linked to EE objectives such as: “*The P.Y Clean Project*” that was taught by teachers from eight learning areas its objective and was developed for students to participate in the treatment and rehabilitation of wastewater by adding oxygen according to use kinetic energy from bicycle riding. The teachers could, from this, identify the courses and determine the learning standards.

Analyzing the Educational Policy. Although the development processes of EE for secondary school teachers were limited to participating in the development process of EE by leading the government educational policy that it was the framework to determine in the teachers schedule in schools, such as STEM education, education, elevating English, Twelve values, Buddhism oriented schools, reduce learning time to increase knowledge time, produce good people into society, 21st century learning skills, living skills, academic skills competition, Dharma camp, volunteer spirit in school and outside school, enough learning, and the identity of the school, etc. However, the teachers in competency development have managed various projects by the government, educational policy to analyze the characteristics of each project, including the objectives of the project, student competency, and desirable student of characteristic. The study

found that the teachers were able to analyze common feature in each project, then, they create a new project under the common feature, which have been analyzed.

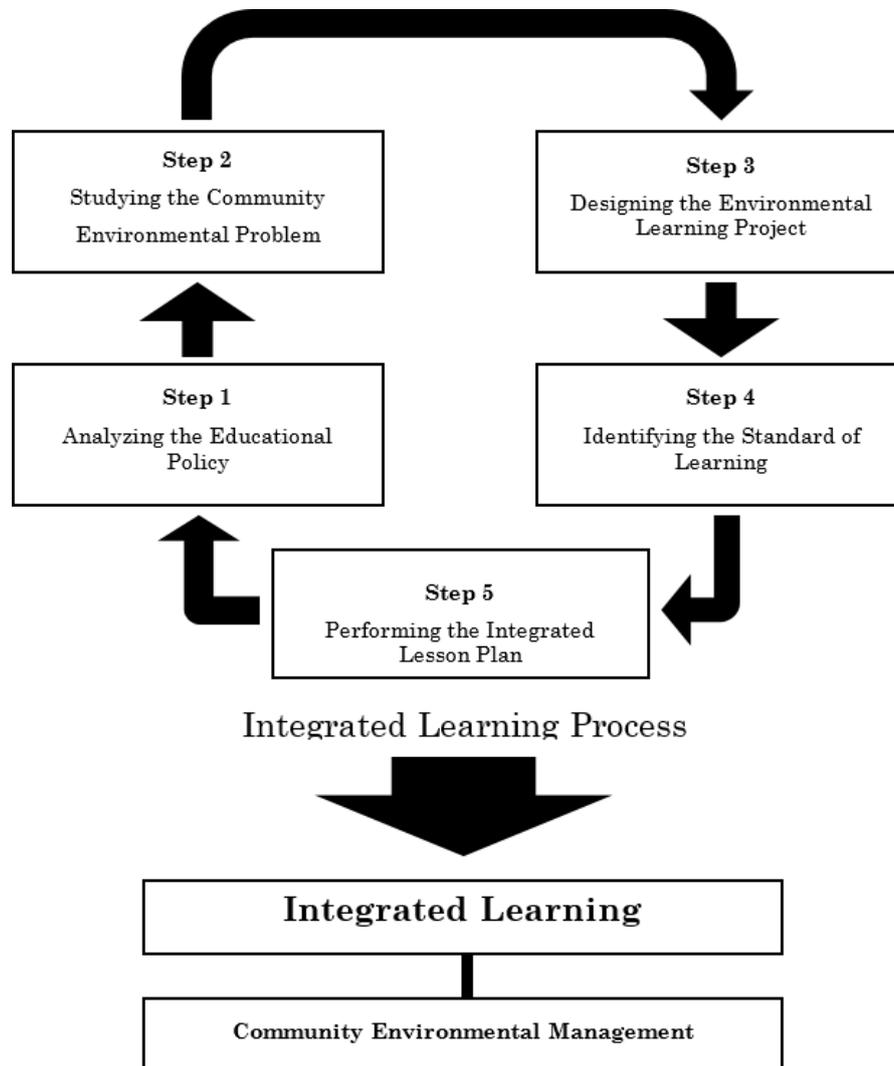


Figure 2: A Model of Environmental Education Competency Development for Teachers in Secondary School adopted from Wachana Y model.

Community based learning. The development process of EE for secondary school teachers that the teachers were limited to participate in the EE development process by a survey around the school. From the survey they drew a map about walking through and set the area to be used as the issues in accordance with the project. In this process, the researcher had monitored the teachers, who were the participating in the EE competency development process and used questioning techniques to motivate the teachers, which participate in the process of visual and systematic thinking.

When the process was completed, the members of each group were jointly presented the projects that was creating. Knowledge transfer was done by exchanging experience from the relevant topics. The obvious observation that most teachers, who join in the EE development process, did not take care on environmental problems in schools and they never think about these problems, what cause was from, such as the problem of pond smelt in school. After the exchange of learning in the classroom, the researcher found that teachers had begun to criticize the cause of the problem and been focusing how to solve problem.

Designing the learning project, the teachers, who were participating in the development process of EE to jointly created the projects and determined their frameworks. Identifying the standard of learning, the teachers participating in the development process of EE which brought the project designed to identify the indicators to accord with each learning area in the Basic Education Core Curriculum 2008 to plan the learning management according in order to the project management. Thus, each group member needed to write storyline together for using the framework in learning activities to the learners. Performing the integrated lesson plan, the teachers participating in the development process of EE, which design their own lesson plan according to the learning standards.

CONCLUSION

At school level, teachers lack the skills to handle environmental education, and teachers do not develop environmental education skills by education policy. The main points to the management of the Eco-School Mission are teachers and administrators must understand of environmental education, teachers like to teach in the classroom and focus on curriculum material; teachers have a lot of work to do because of national education policies, education areas.

There are interesting points found from the EE competency development model for teachers in secondary schools as follows:

Analyzing the educational policy. This was the first step because the teachers needed to ensure that the learning management of integrated EE as a learning management framework of educational policy for various levels, which accorded with Chatzifotiou 2006 about the impact of EE to primary teachers in England that focused on the aims to show the interaction between EE, national curriculum, and primary teachers. In addition, it was described in some aspects of education for sustainable development, which had the based on EE as well. Likewise, Ketlhoilwe (2013) studied a government on EE policy with teachers in Botswana, which found that environmental policy studies at the international level had influenced to determine policy in Botswana and teacher's behaviours in environmental teaching. The analysis would seek to understand deeply about "Effect" in the power of EE policy and to be used by teachers in teaching and learning practices. The results of the research found that the educators made many techniques to reaction of various orders by the policy.

Studying the community environmental problem. This topic was the second step accorded with the concept of community-based learning. The research finding of (Omsin Jatuporn and Amonrat Wattanaton; 2015), its focus to describe the teaching methods in authentic condition that the teachers can use the local community context as the lab learning for creating the students to be able to think in daily life learning, and also links with the society, culture, and various world places. The study of Place based learning, was a term that originated in a new era of the educational reform around the world by focusing on the resources, people and environment for student's learning about the local community development including knowledge of places, location based learning, and field studies as well. There were three important concepts for location based learning as the following: the real learning is authentic assessment and it was an interdisciplinary, the concept was about place-based learning will benefit, when was supported by a network and various organizations in communities, and the learning about the community was the important mains, which will lead to understand more deeply to the issues of regional or social world. The research has pointed to teaching about local-based learning, which can stimulate the student's participation enthusiastically, create a curriculum that was meaningful to the students learning in their daily life and make real change to the local community.

BIBLIOGRAPHY

- Blishen, E. (1969). *This Right Soft Lot*. London: Thames & Hudson.
- Chatzifotiou, A. (2006). Environmental education, national curriculum and primary school teachers. Findings of a research study in England and possible implications upon education for sustainable development. *The Curriculum Journal*, 17(4), 367-381. <https://doi.org/10.1080/09585170601072478>
- D'Amato, L. G., & Krasny, M. E. (2011). Outdoor Adventure Education: Applying Transformative Learning Theory to Understanding Instrumental Learning and Personal Growth in Environmental Education. *The Journal of Environmental Education*, 42(4), 237-254. <https://doi.org/10.1080/00958964.2011.581313>
- Dechakup, P., & Yindeesuk, P. (2014). *Teaching, writing, integration on the child base is important*. Bangkok: Chulalongkorn University.
- Department of Environmental Quality Promotion. (2015). *Access to environmental education for sustainable development*. Bangkok: Department of Environmental Quality Promotion.
- Fogarty, R., & Stoehr, J. (1995). *Integrate Curricula with Multiple Intelligences*. Illinois: SkyLight Training and Publishing, Inc.
- Hopkins. (1973). *Integration, Its Meaning and Application*. New York: Appleton Century Company Inc.
- Jatuporn, O., & Watthanathorn, A. (2015). Place-Based Education: The Development of Good Citizenship in Youth Based on Community Contexts. *Songklanakarin Journal of Social Science and Humanities (SJSH)*, 21(1), 83-111.
- Kethoilwe, M. J. (2013). Governmentality in environmental education policy discourses: a qualitative study of teachers in Botswana. *International Research in Geographical and Environmental Education*, 22(4), 291-302. <https://doi.org/10.1080/10382046.2013.826545>
- NAAEE. (n.d.). *The Core Competencies for Certification Programs*. Retrieved from http://www.naaee.net/files/core_competencies.pdf
- Porntri, S., & Wattarart, J. (2016). The study of the effects of research-based learning management through Pohpanpunya Project. *Journal of Teaching and Learning Development Rangsit University*, 10(1), 14-26.
- Rodsaen, A., Kaew-Urai, V., & Chanbanjong, C. (2016). Development of a model for organizing learning activities together to enhance citizenship teaching ability for basic education teachers. *Journal of Education Naresuan University*, 18(1), 95-105.
- Srisaiyapetch, O. (2016). The effect of using guidance activities by project-based learning to develop problem-solving skills of grade 10 students 3 Princess Chulabhorn's College, Satun Province. *Journal of Academic Service, Prince of Songkla University*, 27(2), 61-68.
- Wanchana, Y., Inprom, P., Rawang, W., & Ayudhya, A.J. (2019). A Model of Environmental Education Competency Development for Teachers in Secondary Schools. *International journal of environmental and science education*.