

ENHANCING THE ENVIRONMENTAL AWARENESS AND SENSITIVITY OF PADANG PRIMARY SCHOOL LEARNERS THROUGH PROJECT-BASED LEARNING

BRENDA A. DELA PEÑA
Padang Primary School
San Gabriel District, Division of La Union

Abstract

With the increasing environmental issues and concerns, it is important for a person to be aware and to be sensitive because a clean and healthy environment is everyone's right and responsibility. The Department of Education wants every learner to develop the core value of being environment-friendly. The said core value is highlighted as one of the competencies integrated in some learning areas like Science, Social Studies, Values Education and Arts. This action research aimed to determine how the Project-Based Learning helped in enhancing the level of environmental awareness and sensitivity of twenty-seven (27) intermediate learners of Padang Primary School. The experimental, one-group design was used and observation and interview, mean, frequency counts and t-test dependent were the instruments to gather and interpret the data. The result of pretest showed that the learners were fairly aware and moderately sensitive about the environmental lessons. The interventions used were video analysis, journal writing, lecture, training on waste management practices and giving monthly award. The data gathered from interviews about the insights of the learners on project-based learning activities were used to strengthen the results of the study. The posttest was conducted after using the intervention. The project helped the learners enhance their level of environmental awareness and sensitivity. It should be adopted in the primary grade of Padang Primary School to continuously sustain the effectiveness of the project and by other schools with low environmental awareness and sensitivity.

Keywords: Environmental Awareness, Environmental Sensitivity, Project-Based Learning, Environmental Lessons, Waste Management Practices, Intermediate Learners

1. Introduction

Environmental awareness and environmental sensitivity are two significant words that have deeper definitions when they are to address environmental issues and concerns. These two terms need to be deepened because the learners have insufficient environmental disclosures and they have low participation to environmental activities. Some of the learning areas like Science, Social Studies, Values Education, Health Education, Home Economics and Livelihood Education and Filipino have K to 12 environmental competencies or lessons that need to be deepened because learners need to be fully aware and sensitive due to increasing environmental issues and concerns happening at present.

Environmental literacy consists of skills and processes that learners have to know and be able to do, enact or to demonstrate. In other words, environmental awareness is knowing the impact of human behavior on the environment and environmental sensitivity is a perception-based (affective) to what happens in the environment. Though environmental awareness and sensitivity are different in meaning, they can still work together to achieve the goal of understanding the environment. These two components need to be enhanced so that learners would be able to live up to these competencies and be part of keeping a clean and healthy environment (Erdogan, 2009).

One of the missions of the Department of Education is to provide a safe and motivating learning environment to the learners (DepEd Order No. 36, s. 2013). And to make this possible and meaningful, the K to 12 Basic Education Curriculum integrated the learning competencies on environmental lessons in the different subject areas. The learning competencies focus on conservation and preservation of the environment, cleanliness and orderliness and waste management. These are some of the competencies stated in the vision of the Department of Education that must be realized. If these competencies were achieved and actualized by the learners, they can potentially and meaningfully contribute to building the nation with a safe environment to live in. In core values of the Department of Education, being "environment-friendly" should be developed in the learners (DepEd Order No. 36, s. 2013).

In Padang Primary School, it had been observed that during class discussions on environmental lessons or integration of values of being environment-friendly or nature-loving, learners are active and participative. They knew how to answer questions like how to keep their environment healthy and safe. But the knowledge that they shared on preserving and conserving the environment did not reflect in their actions when they were outside the classrooms or after the lessons. An example of activity where learners were unaware and became insensitive was there were several trash bins for segregations, but still wastes were mixed or litters are scattered. Though the teacher had been strictly implementing some rules on cleanliness and orderliness, learners still forgot their responsibilities on how to manage their wastes.

Another example was that they really did not know the advantages of 4R's (refuse, reduce, recycle and reuse). As a result, more wastes were created, utilized and dumped in the garbage pit or in the trash bins. These activities did not support the Second Law of Ecology of Barry Commoner which states that everything must go somewhere (Strauss, 2013). In making of their projects, learners preferred to buy new materials rather than looking for the available resources in the community. In writing, if they committed mistakes, they just threw the used paper without thinking of using the back part of it. They knew the ways to take care of their school environment but the actions on how they do it were still missing.

This inconsistency in knowledge and practice is a direct contradiction of different philosophies. One of which is Korhonen & Lappalainen (2004) as mentioned by Erdogan (2009) which stressed that taking action for environment was also highly influenced by environmental knowledge (specifically knowledge on action strategies). In addition to knowledge about environment, when the individuals knew how to behave towards the environment, they tend to develop action skills. Further, attitudes/interests and curiosity for the environment influences the motivation to take action and develop responsible behavior. Moreover, Chapman's idea (2014) also agreed that Environmental Education is an important element in raising awareness and understanding of sustainability and environmental issues within the schools and in changing behavior for a more sustainable future. He added that Environmental Education in the school sector should provide opportunities for learners and teachers to engage in actions and behavior that impact positively towards achieving a more sustainable future and have more environmental stewards in our midst, environmental education and training should be prioritized by the government and schools.

With the problem already surfacing, it is very important to focus more on the specific objectives of the study and to provide distinction between awareness and sensitivity.

2. Method

2.1. Research Design

The design used in the study was the experimental one-test group design. According to Shuttleworth (2009), pretest-posttest designs are the preferred method to compare participant groups and measure the degree of change occurring as a result of treatments or intervention. It is an experiment where measurements are taken both before and after a treatment. This is appropriate for the study since the researcher intends to see the effects of some type of treatment on a group.

2.2. Participants

Twenty-seven (27) learners from intermediate level of Padang Primary School took part in the study. Most of the learners were not environmentally aware and sensitive as proven in the preliminary test that was conducted for them. They were chosen because their grade levels indicated sufficient maturity and experience, enough to be trained on project-based learning that may provide the learners in the primary level as models in keeping their school environment clean and orderly. The said grade levels have the most number of competencies which emphasized on waste generation, waste segregation/sorting, recycling, composting and disposal.

2.3. Instrumentation

The intervention activities used were video analysis, journal writing, and lecture using environmental tasks series guide and training on application of waste management practices. The learners viewed videos on current situations on how waste management practices were done in a certain place or in the school. There were five (5) questions answered by the learners about the videos. After answering the questions, learners made outputs and applied the knowledge on waste management

practices in their school. The last part of the intervention was journal writing wherein insights/experiential learning of the learners were written in their recycled journal compilation.

The pretest and posttest had test questions which was derived from the competencies of different subject areas where environmental lessons were integrated. In determining the level of environmental awareness and sensitivity among the intermediate learners, a 40-item awareness and sensitivity tests consisted of 35-multiple choice and a 5-question and answer was designed by the researcher. In the video analysis, it has also 5 questions. The test material was constructed based on the K to 12 Curriculum which are found in some learning areas. In constructing the table of specifications, the revised Bloom's Taxonomy of Learning was considered. The tests questions were subjected to scrutiny and validation by one master teacher, the District Supervisor and the District Science Coordinator. The test has two parts. The first composed of 20-item awareness test and the second part composed of 20-item sensitivity test. The test material used in conducting the pretest and posttest was the same. The learners were given one hour and thirty minutes the tests and were not allowed to scan the guide where they had learned the environmental lessons and practices. After the tests, the materials were collected and checked based on the answer key and a rubric or checking scheme. The results of the pretest and posttest was interpreted using the scoring scale which was patterned from the Likert Scale. It was administered to the learners in Filipino language for clarity.

To improve the results of the pretest, there were interventions used by the researcher. The journal writing was conducted on the 5th day of the first task, the learners wrote their insights, ideas or anything that they had learned from the activity. They freely expressed their thoughts in their own recycled journal compilation. The lecture was conducted with a project-based learning guide provided to the learners. The environmental tasks series guide was also used as a tool in the implementation of the interventions to increase and improve the awareness of the learners.

The content of the guide was read and discussed to the learners to give additional information of what they had realized in the video. A training was done with the learners. They went out from their classrooms on the third day to experience and learn the waste management practices to be able to bring out/make an output. The video analysis was done through selected videos on waste generation, waste sorting/segregation, waste recycling, composting and waste disposal. These were viewed by the learners. One video was viewed to them weekly. After viewing, the learners answered five (5) questions about the video. An informal observation was done by the researcher on how they used the trash bins, how they treat the wastes or litters scattered around the school and how they throw them in the garbage pit. Likewise, the teacher interviewed and asked some questions about wastes during recess time and lunch break on what the learners will do about the wastes they have in their hands or they produced inside the classroom.

Further, the pretest was conducted after the informal observations and interviews. The five project-based learning had five (5) activities and each activity was done every week in the school; watched the video on the first day, analyzed the video on the second day, shared their answers on the third day, trained and applied the knowledge outside the classroom on the fourth day, made an output and wrote a journal on the fifth day. After the five project-based learning activities, the post test was followed to see to it if there was an improvement on their level of awareness and sensitivity. Comparison between preliminary and post-tests was used to determine the significant change occurred in the learners' level of environmental awareness and sensitivity.

2.4. Data Analysis

The data gathered was collated, organized, tallied and presented in tables to ensure accuracy, order and for the systematic analysis of the data. The basic statistical tools used for the level of environmental awareness and sensitivity were mean, percentage of mastery and frequency counts. The significant difference between awareness and sensitivity was analyzed using t-test. Based on the results of the level of environmental awareness and sensitivity of the learners, the project-based learning activities were formulated. It includes the lesson, the description and the expected output. The result for the level of environmental awareness and sensitivity of the learners through project-based learning was measured and interpreted using scores with the following numerical and descriptive values:

Level of Environmental Awareness on Project-Based Learning		
Point Value	Statistical Range (Scores Obtained in the Test)	Descriptive Equivalent
5	17-20	Very Highly Aware
4	13-16	Highly Aware
3	9-12	Moderately Aware
2	5-8	Fairly Aware
1	0-4	Not really Aware

Level of Environmental Sensitivity on Project-Based Learning		
Point Value	Statistical Range (Scores Obtained in the Test)	Descriptive Equivalent
5	17-20	Very Highly Sensitive
4	13-16	Highly Sensitive
3	9-12	Moderately Sensitive
2	5-8	Fairly Sensitive
1	0-4	Not really Sensitive

3. Results

3.1. Level of Awareness and Sensitivity of Learners on K to 12 Environmental Lessons during the Preliminary Tests (Before the Interventions)

Table 1 reveals that out of twenty-seven (27) learners, twelve (12) of them were fairly aware with scores of 5-8 and thirteen (13) with scores of 9-12 were moderately sensitive on environmental lessons before the interventions were conducted. From the twenty-seven (27) learners, only 1 was not really aware with a score of 0-4 and 1 learner with a score of 17-20 which was interpreted as very highly sensitive. Most of the learners' score were in 5-8 and 9-12. Only 9 learners got scores of 13-16 with a descriptive equivalent rating of highly aware and highly sensitive.

Table 1. Level of Awareness and Sensitivity of Learners on K to 12 Environmental Lessons during the Preliminary Tests (Before Interventions)

Scores	Descriptive Equivalent Rating	Level of Awareness Frequency	Level of Sensitivity Frequency
17-20	Very Highly Aware/Sensitive	0	1
13-16	Highly Aware/Sensitive	5	4
9-12	Moderately Aware/Sensitive	9	13
5-8	Fairly Aware/Sensitive	12	9
0-4	Not really Aware/Sensitive	1	0
TOTAL		27	27

3.2. Level of Awareness and Sensitivity of Learners on K to 12 Environmental Lessons (After the Interventions)

Table 2 presents that out of twenty-seven (27) learners, thirteen (13) of them became very highly aware and the level of sensitivity increased from four in the pretest to fifteen (15) in the posttest which was highly sensitive. There was a big increase in the level of awareness and level of sensitivity after the implementation of different interventions. From twenty-seven (27) learners, only six were moderately aware and there was only one who was moderately sensitive.

Table 2. Level of Awareness and Sensitivity of Learners on K to 12 Environmental Lessons (After the Interventions)

Scores	Descriptive Equivalent Rating	Level of Awareness Frequency	Level of Sensitivity Frequency
17-20	Very Highly Aware/Sensitive	13	11
13-16	Highly Aware/Sensitive	8	15
9-12	Moderately Aware/Sensitive	6	1
5-8	Fairly Aware/Sensitive	0	0
0-4	Not really Aware/Sensitive	0	0
TOTAL		27	27

3.3. Significant Difference on the Awareness of Learners during Pretest and Posttests

Table 3 shows the significant difference on environmental awareness of learners before and after the interventions were done. The pretest result obtained a mean of 9.14 and the posttest with a mean of 15.88. The pretest and posttests results got a 6.76 difference with a computed t-value of 1.13911E-10 and 1.70561792 t-critical which indicates that the results were significant.

Table 3. Significant Difference on the Awareness of Learners during Pretest and Posttests

	Mean	Difference	Computed t- value	t-crit.	Description
Pretest	9.14	6.76	1.13911E-10	1.70561792	Significant
Posttest	15.88				

3.4. Significant Difference on the Sensitivity of Learners during Pretest and Posttests

Table 4 discloses the significant difference on environmental sensitivity of the learners before and after the conduct of the interventions. The pretest result got a mean of 10.22 and 15.92 for the mean of posttest results. The pretest and posttest results obtained a difference of 5.70. The computed t-value of the results was 8.1E-13 and t-critical was 1.705618 which means that the results were significant.

Table 4. Significant Difference on the Sensitivity of Learners during Pretest and Posttests

	Mean	Difference	Computed t- value	t-crit.	Description
Pretest	10.22	5.70	8.1E-13	1.705618	Significant
Posttest	15.92				

4. Discussion

4.1. Level of Awareness and Sensitivity of Learners on K to 12 Environmental Lessons during the Preliminary Tests (Before the Interventions)

Table 1 shows that learners who took part in the preliminary tests were analyzed as fairly aware and moderately sensitive of the waste management practices. It presents that most of the learners were only fairly aware of the project-based learning activities on the percentage of mastery with only forty-seven percent (47%). This means that learners' awareness was very limited or does not have enough knowledge about those activities. In terms of sensitivity, the percentage of mastery was only fifty-one percent (51%). It implies that learners with lack of or limited awareness would redound to being moderately sensitive on how those activities are applied and what could be the implications on them

and to their environment. It is clearly shown that learner's lack of or limited awareness affects their attitude on how they will respond to the project-based learning activities.

The result stated in table 1 runs parallel to Erdogan (2009) who noted that people seem to be indifferent towards protecting the environment and developing environmental literacy and responsible behavior for a long time; they might have opportunities to develop responsible behaviors toward the environment and gain understanding for sustainable future through education and positive attitudes.. In addition, Hungerford and Volk (1990) also pointed out that there is a need to teach environmental significant ecological concepts and the environmental interrelationships that exist within and between these concepts and provide carefully designed and in-depth opportunities for learners to achieve some level of environmental sensitivity that will promote a desire to behave in appropriate ways. This action research sought to address this concern, that the learners must be made aware and their sensitivities towards environmental issues and problems be triggered in order for them to become action-oriented towards environmental protection and sustainability.

4.2. Level of Awareness and Sensitivity of Learners on K to 12 Environmental Lessons (After the Interventions)

After the interventions were done and implemented on environmental tasks, there was a positive response from the learners as shown in table 2. Learners became very highly aware of the project-based learning activities such as waste segregation, waste generation and composting, recycling and waste disposal. Awareness of learners from 47% mastery which was improved to 77% implies that learners learned a lot about each activity. In terms of the sensitivity of learners, there was a pronounced change too in their attitudes towards the environment. From fifty-one (51%-moderately sensitive) mastery level on how they respond to the needs of their environment, it jumped to 80% (highly sensitive) which was really a commendable performance. This confirms that once the learner learned to become familiar and aware of what the environment is all about, the learners become sensitive to its needs. The interventions conducted and implemented like project-based learning activities were relevant and responsive to change and undesirable attitudes of learners on how they treat the environment.

4.3. Significant Difference on the Awareness of Learners during Pretest and Posttests

Table 3 presents the significant difference on the level of awareness of learners during pre-test and post-test using t-Test: Paired Two Sample for Means. The results on level of awareness was significant with $P(T \leq t)$ one-tail value of $1.13911E-10$. This means that the inputs used in the project-based learning activities were effectual which helped the learners improved and increased their level of awareness on environmental lessons. It is vital that learners learned the necessary concepts about project-based learning activities so that they will know how to respond properly to the needs of their environment. The design used in the study was appropriate to identify the impact of the interventions conducted to the learners. The t-calculated which interpreted as significantly higher than the t-critical means the intervention used is very much appropriate and it had a great bearing to deepen the level of awareness of the learners on the K to 12 environmental lessons.

4.4. Significant Difference on the Sensitivity of Learners during Pretest and Posttests

The very high awareness of the learners brought out their highly sensitive treatment to their school environment. Table 4 shows the significant difference of the level of sensitivity of learners during preliminary and post-test using t-Test: Paired Two Sample for Means with $P(T \leq t)$ one-tail value of 1.70561792 . The result was significant which means project-based learning activities done were useful. The increased awareness of the learners on environmental lessons helped them become more responsible and sensitive with their actions in treating the environment. The traditional practices on waste management were transformed into creative, innovative and environment-friendly activities and outputs. The relevant and responsive project-based learning activities are important to constantly and continuously develop the value of being "environment-friendly" which is one of the core values of the Department of Education. The level of awareness of the learners was deepened through the interventions designed for the study wherein they had a meaningful response during the implementation of the said project-based learning activities.

The significant differences results indicated that taking action for environment was highly influenced by environmental knowledge (specifically knowledge on action strategies) in accordance to Korhonen and Lappainen (2004). Erdogan (2009) emphasized that individuals should become more aware of the environmental concerns to develop a responsible behavior to cope up with the problems. The result of this study showed that learners must become more aware of the environmental concerns

to develop a responsible behavior to cope up with the problems. Therefore, awareness and sensitivity should go together to enhance the K to 12 environmental lessons.

5. Conclusions

Project-based learning activities on environment have a positive impact on enhancing the level of environmental awareness and sensitivity of the learners. Learners who were very highly aware of the project-based learning activities would help to continue the task to be implemented systematically, effectively and efficiently. They will remain a product of relevance and responsiveness to enhance their level of awareness. Learners who were highly sensitive to the environmental issues, concerns and activities are role models for being environment-friendly.

References

Chapman, P. (2014), Environmental education and sustainability in U.S. public schools, retrieved from projectgreenschools.org/wp/wp-content/uploads/2014/08/USGreenSchools12114.pdf on January 22, 2017

DepEd Order No. 36, s. 2013- Our Department of Education vision, mission and core values (DEPED VMV), retrieved from www.deped.gov.ph/2013/09/04/do-36-s-2013-our-department-of-education-vision-mission-and-core-values on January 21, 2016

Erdogan, M. (2009), Fifth grade student's environmental literacy and factors affecting students' environmentally responsible behaviors, retrieved from etd.lib.metu.edu.tr on January 21, 2016.

Hungerford, H.R. and Volk, T.L. (1990), Changing learning behavior through environmental education, retrieved from <http://www.elkhornsloughctp.org/uploads/files/1374624954Changing%20learner%20behavior%20-%20H%20V.pdf> on January 18, 2016

Korhonen, K. and Lappalaine (2004), Examining the environmental awareness of children and adolescents in the Ranomafana Regin Madagascar, retrieved from <http://eric.ed.gov/?id=EJ680607> on January 21, 2016

Shuttleworth, M. (2009), Pretest-post designs, retrieved from <http://explorable.com/pretest-posttest-designs> on January 22, 2016

Strauss, S. (2013), The four laws of ecology-Barry Commoner, retrieved from pachurchsadvocacy.Org/weblog?p=13345 on January 16, 2018