

ASSESSMENT OF ENVIRONMENTAL EDUCATION MATERIALS FOR CONTENT COURSES IN THE TEACHER EDUCATION

Maria Joselyn J. Paje
Bicol University College of Education

ABSTRACT

The Teacher Education curriculum can serve as meaningful context for teaching the future teachers environmentally responsible behaviors. This study aimed to review the Content Courses in the Bachelor of Elementary Education curriculum in order to identify entry points of Environmental Education (EE) integration, to assess the available Department of Environment and Natural Resources (DENR) EE materials, and to develop and validate exemplar session plans with EE integration. The developmental-descriptive-evaluative method of research was used. The data gathering techniques used were documentary analysis, assessment of DENR EE materials using an adapted rubric, and validation of proposed session plans using a researcher-made rubric. A total of 19 syllabi for Content Courses in BEED were analyzed, and 15 DENR EE materials and 22 session plans were assessed. Results showed that the EE concepts can be well-integrated in the Content Courses of the Bachelor of Elementary Education as indicated by the identified entry points for EE integration. The EE materials developed by the DENR were found to be highly appropriate, highly relevant, and highly flexible as instructional materials for EE integration in the different Content Courses. The proposed session plans integrated with EE were rated very good to excellent by the jurors, thus ready for delivery to teacher education students.

Keywords: *content courses, curriculum, environmental education, session plans, teacher, education program*

INTRODUCTION

The current state of the environment calls for concerted and proactive efforts towards strengthened environmental education (EE). Decades ago, the United Nations (UNESCO, 1977) emphasized the significance of environmental education by highlighting three goals which include: (1) To foster clear awareness of, and concern about, economic, social, political, ecological interdependence in urban and rural areas; (2) To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve environments; and (3) To create new patterns of behavior of individuals, groups, and society as a whole toward the environment.

Currently, the country has an existing law, the Republic Act 9512 – National Environmental Awareness and Education Act of 2008 which requires not only the government but also the people's participation and support in strengthening environmental protection. In support of this law, the education sector should take necessary action to do its share in the environmental education of

various sectors. This law specifically mandates the Department of Education, Commission on Higher Education and Technical Education and Skills Development Authority, in coordination with the DENR and other relevant agencies, to undertake capacity-building programs nationwide such as trainings, seminars, workshops on environment education, development and production of environmental education materials, and teacher-education courses and related livelihood programs (Section 6 & 7, RA 9512).

In the higher education level, the Teacher Education serves as context for environmental education utilizing the existing EE materials developed by DENR. The enrichment of the said academic program will be an impetus to train future teachers as role models for responsible environment behaviors and as agents of transformation in the environmental protection. One important effort towards this is the review of the Teacher Education program such as the Bachelor of Elementary Education, and thereafter develop exemplar lessons which integrate EE concepts and principles.

This study generally aimed to review the Content Courses in the Bachelor of Elementary Education, and validate proposed lessons that integrate EE concepts and principles. Specifically, it aimed to: (a) identify the points of EE integration, (b) assess the EE materials developed by DENR in terms of appropriateness for integration, flexibility for integration, and relevance to academic program, and (c) develop and validate the proposed session plans.

ANALYTICAL FRAMEWORK

The new framework for environmental education (Monroe, Andrews and Biedenweg, 2007) puts forth four purposes of EE which include the following: convey information, build understanding, improve skills and enable sustainable action. One of the key points of the theory is that EE is a complex and broad umbrella term that incorporates a variety of strategies and content from natural science to social science and top-down to bottom-up with little to great audience participation.

Grounding on Monroe, Andrews and Biedenweg's (2007) new framework for environmental education, this study purports the significance of mainstreaming of EE in the Teacher Education Program which is consistent with Republic Act No. 9512 – National Environmental Awareness and Education Act of 2008 which mandates the involvement of various sectors in environmental education in order to ensure that the environmental laws are upheld, and that practices and behaviors are environmentally responsible. Part of this law is the development and production of environmental education materials, and teacher-education courses and related livelihood programs (Section 6 & 7, RA 9512).

In this context, it is deemed important to review the Teacher Education Curriculum through content analysis of the syllabi in order to identify points of integration for environmental education. Similarly, the DENR environmental education materials need to be assessed in terms of appropriateness for integration, relevance to the academic program and flexibility for integration. The assessment results will indicate whether they may be used in the proposed lessons in various Content Courses in the Bachelor of Elementary Education program which integrate environmental concepts and principles.

In keeping with the rigors for materials development, the proposed lessons are then submitted to jurors for validation in terms of learning outcomes, contents (EE integration), strategies/procedures, assessment and conventions. The suggestions and comments of jurors are incorporated in the revision of the proposed lessons. Then the, EE-enriched lessons will utilize the EE materials developed by DENR, the national agency primarily mandated to make initiatives along environmental protection and conservation.

Figure 1 shows the analytical paradigm following the Input- Throughput- Output Process. The input covers the Content Courses and DENR Materials. The Throughput indicates the analysis of the points of integration, the assessment of the DENR EE materials, and the validation process of the proposed session plans. The output constitutes the EE-enriched session plans in Content Courses.

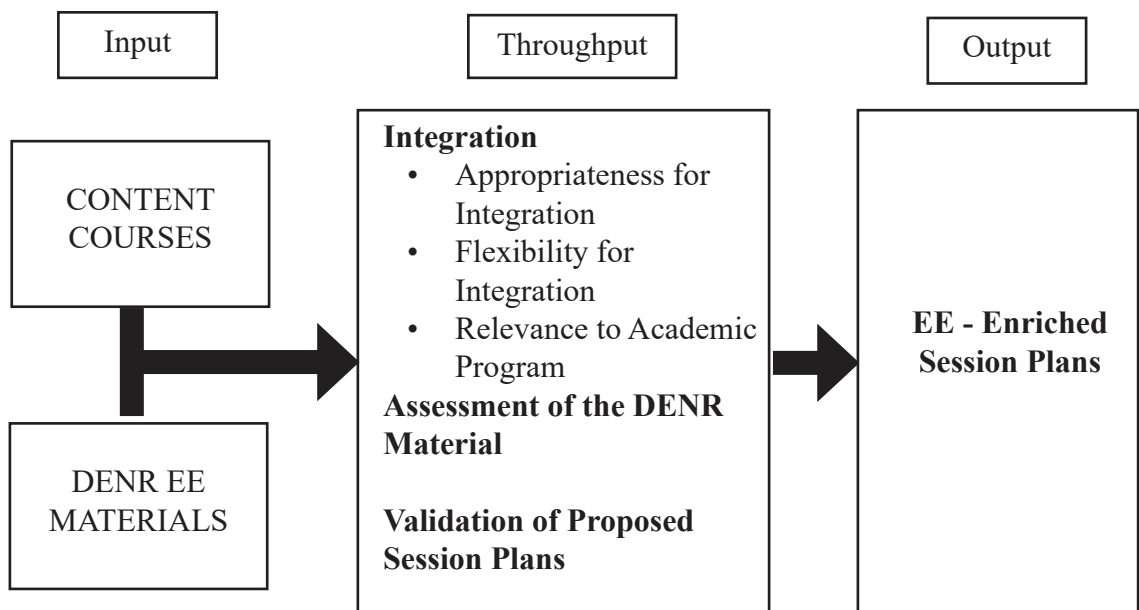


Figure 1. Analytical Paradigm

MATERIALS AND METHODS

The study used documentary analysis of the Teacher Education Curriculum to determine the entry points for the Environmental Education concepts in the Content Courses in the BEED curriculum. A total of 19 syllabi for the different Content Courses were analyzed by seven (7) Teacher Education faculty from Bicol University.

The evaluative method was used to assess the EE materials developed by DENR in terms of: 1) appropriateness for integration, 2) relevance to the academic program, and 3) flexibility for integration. A total of 15 DENR EE materials consisting of four materials for Humanities and Social Studies (HumSS) courses and 11 materials for Science, Technology and Mathematics (STeM) courses were assessed by seven jurors. An adapted rubric from North American Association for Environmental Education (2004) was used to assess the following types of EE materials: DENR

produced EE Materials; DENR produced Non-Print EE materials; EE Materials Downloaded from the Official DENR Website; and EE Materials used by Resource Persons during the Capability-Building Activity of the DENR Research Team.

The developmental-evaluative method was used to validate the 22 proposed session plans (SPs) integrating EE concepts using the DENR EE materials using a researcher-made rubric by three jurors. The proposed SPs were assessed guided by following criteria: the Learning Outcomes, Content (whether the EE concepts were integrated), Strategies/Procedure, and Assessment, Conventions (correct usage, spelling and mechanics). The range of ratings is shown in Table 1 while the range of ratings for validation of session plans are: 1.00 – 1.74 – Poor, 1.75 – 2.49 – Good, 2.50 – 3.24 - Very Good, and 3.25 – 4.00 – Excellent.

Descriptive statistics such as frequency count and weighted mean were used to interpret the data on the assessment of the DENR EE materials and proposed session plans.

Table 1. Range of ratings for assessment of DENR-EE materials

Range	Appropriateness	Relevance	Flexibility
1.00 - 1.79	Not appropriate	Not relevant	Not flexible
1.80 - 2.59	Slightly appropriate	Slightly relevant	Slightly flexible
2.60 - 3.39	Moderately appropriate	Moderately relevant	Moderately flexible
3.40 - 4.19	Appropriate	Relevant	Flexible
4.20 - 5.0	Highly appropriate	Highly relevant	Highly flexible

RESULTS AND DISCUSSION

Teacher education curriculum and identified EE points of integration in Content Courses in BEED

The 19 syllabi for the Content Courses in BEED were analyzed by identifying the topics in which EE concept and principles can be introduced or integrated. All subjects from second year to fourth year were found to have topics which can be integrated with EE. Of the 26 topics identified as EE points of integration from 19 courses, more topics come from Social Studies - Geography 1 with three topics. Five courses such as Math 3, English 5, Science 3, English 6, and MAPE 1 have two topics, while the rest has one topic which may be integrated with EE (Table 2).

Table 2. BEED syllabi and identified content courses for integration

		SUBJECT		ENTRY POINTS
	Course Code	Descriptive Title		
FIRST YEAR – first and second semester none				
SECOND YEAR				
1st Sem	Math 3	Advanced Algebra and Trigonometry		Exponential Functions Linear Equations
	Literatura 1	Mga Anyo ng Kontemporaryong Panitikang Pilipino		Ang Impluwensya Ng Panitikan
2nd Sem.	Math 4	Plane And Solid Geometry		Polygons
	Sci 1	Inorganic Chemistry		Matter, Physical Change and Chemical Reaction
	Engl 4	Philippine Literature in English		Historical Background
THIRD YEAR				
1st Sem.	Literatura 2	Pagpapahalagang Pampanitikan		And Sining At Dula
	Math 5	Analytic Geometry and Introduction to Calculus		Distance And Mid-Point Formula
	Sci 2	Physics for Health Sciences		Work, Energy and Machines
	SocStud Geo 1	Basic Geography		The Globe The Solar System The Face of the Earth
	Engl 5	Masterpieces of the World Literature		The Story of Shakuntala The Story of Job
	HELE 1	Home Economics and Livelihood Education		Livelihood
2nd Sem.	Math 6	Problem Solving		Types Of Problems
	Sci 3	Ecology		Ecosystem Biodiversity
	SocStud Geo 2	Geography And Natural Resources Of The Philippines		Location, Climate Physical Feature
	Engl 6	Interactive English: Listening, Speaking and Grammar, Grammar Improvement		Job Interview Parts Of Speech
FOURTH YEAR				
1st Sem.	Engl 7	Children and Adolescent Literature		Children’s Need and Reading Interest
	Sci 4	Astronomy		Our Place in Space
	Values Ed 1	Personhood Development		Growing in Moral Awareness
	MAPE 1	Music, Arts & Physical Education		Texture and Harmony Brass/Wood Band Instruments

The Humanities and Social Sciences (HumSS) include the following courses: Languages, Filipino, Social Studies, Music Arts and Physical Education (MAPE) (Table 3). Data revealed that in the second year level, no EE concepts can be integrated in Social Studies and MAPE subjects. However, Languages and Social Studies provide more number of possible entry points

for integration in the third year level. Considering the nature of HumSS as discipline, out of 10 courses offered (CO), the jurors identified 15 Content Courses (CC) as an entry points for EE integration.

Table 3. Points of Integration for EE in Content Courses for HumSS

Year	Languages		Filipino/ Literature		Social Studies		MAPE		Total	
	CO	CC	CO	CC	CO	CC	CO	CC	CO	CC
2nd Year	1	1	1	1	-	-	-	-	2	2
3rd Year	2	4	1	1	2	4	-	-	5	9
4th Year	1	1	-	-	1	1	1	2	3	4
Total	4	6	2	2	3	5	1	2	10	15

Note: CO – Courses Offered; CC – Content Courses

The STeM Content Courses include: Science, Technology and Livelihood Education (TLE) and Mathematics (Table 4). EE concepts as a general science in nature is best integrated both in science and mathematics subjects as revealed by the results. For all the courses, it was observed that less number of subjects are offered in the fourth year level as the second semester is devoted to practice teaching.

Table 4. Points of Integration for EE in Content Courses for STeM

Year	Mathematics		TLE		Science		Total	
	CO	CC	CO	CC	CO	CC	CO	CC
2nd Year	2	3	-	-	1	1	3	4
3rd Year	2	2	1	1	2	3	5	6
4th Year	-	-	-	-	1	1	1	1
Total	4	5	1	1	4	5	9	11

Note: CO – Courses Offered; CC – Content Courses

The results imply that the Content Courses can aptly serve as vehicle for environmental education of pre-service teachers. The identified points of integration show adequacy for the mainstreaming of EE in the BEED program. If and when this mainstreaming is done in a well-planned and comprehensive manner, the mainstreaming of environmental education will address the basic purposes of conveying information, building understanding of various environmental concepts, principles and issues; improving skills related to environmental protection and conservation on a personal level, family, school or community level; clarifying and strengthening values needed to assist in promoting, supporting and sustaining environmentally appropriate behaviors and practices, and enabling sustainable action towards the protection and conservation of the environment and natural resources (Monroe, Andrews & Biedenweg, 2007). It should be underscored however that after identifying the entry points for environmental education, developing implementable lessons and classroom activities as mandated by law (RA 9512) using DENR materials should ensue, and be made among the priority academic innovation of the school.

Assessment of DENR EE materials used in session plans in selected content courses

Instructional materials play a crucial role in the delivery of the lesson, and in the promotion of engaging lessons. In the EE-enriched session plans, the EE materials are important so that delivery of such lessons will be facilitated. Primary consideration was given to the DENR EE materials as instructional EE resources for the proposed lessons. These consist of print and non-print materials as well as those downloaded from the official website and those produced during the training of teachers with resource persons from DENR.

Appropriateness for integration

The appropriateness for integration considers both depth and emphasis. Depth means that the EE materials should foster awareness of the natural and built environment, an understanding of environmental concepts, conditions, and issues, and an awareness of the feelings, values, attitudes, and perceptions at the heart of environmental issues, as appropriate for different developmental levels. These cover awareness, focus on concepts, concept in context, and attention to different scales. Emphasis on skills building requires that the EE materials should build lifelong skills that enable learners to address environmental issues. These skills include critical and creative thinking skills, applying skills to issues, and action skills (NAAEE, 2004).

Table 5. Assessment of DENR EE materials in terms of appropriateness for integration

DENR EE Materials Used in Session Plans	Appropriateness for Integration		Over-all Results	Interpretation
	Depth	Emphasis		
Session Plans for HumSS Content Courses				
1	4.00	3.67	3.83	Appropriate
2	4.57	3.95	4.26	Highly Appropriate
3	4.54	4.57	4.55	Highly Appropriate
4	4.80	4.80	4.80	Highly Appropriate
Over-all	4.48	4.25	4.36	Highly Appropriate
Session Plans for STeM Content Courses				
1	4.58	4.00	4.29	Highly Appropriate
2	4.54	4.57	4.55	Highly Appropriate
3	4.50	4.33	4.42	Highly Appropriate
4	4.00	4.51	4.25	Highly Appropriate
5	4.75	4.67	4.71	Highly Appropriate
6	4.31	3.42	3.86	Appropriate
7	4.29	3.81	4.05	Appropriate
8	4.57	4.19	4.38	Highly Appropriate
9	4.57	3.31	3.94	Appropriate
10	4.00	4.05	4.02	Appropriate
11	4.83	4.44	4.64	Highly Appropriate
Over-all	4.45	4.09	4.27	Highly Appropriate
Interpretation	Highly Appropriate	Appropriate	Highly Appropriate	

Three out of the four materials used for session plans for HumSS Content Courses were found to be highly appropriate. Seven materials used for STeM session plans were found to be highly appropriate while four were found to be appropriate (Table 5). These results which are consistent to the findings for the other courses in the Teacher Education program (Llenaresas & Llenaresas, 2016; Bercasio & Gayo, 2016) reveal that the DENR EE materials are useful as instructional materials in the lessons in HumSS Content Courses. Although this may not be the original intent of the DENR, the materials in their current form are acceptable references. This then points to the use of the said EE materials in Teacher Education program which, in turn, implies the need to disseminate such EE materials to different Teacher Education institutions (TEIs).

Considering that the rubric adapted for assessing the materials come from an international organization, it can be stated that the 15 DENR EE materials pass the standards set by the said organization. In other words, these materials prepared by DENR underwent rigorous procedures and adhere to high standards. Although there could have been no specific purpose in using the materials for teacher education courses, these were found to be generally highly appropriate as instructional resources for EE-enriched lessons for the selected Content Courses.

Relevance to Academic Program

Relevance to the academic program covers both action orientation and instructional soundness. Action orientation means that the EE materials should promote civic responsibility, encouraging learners to use their knowledge, personal skills and assessments of environmental problems and issues as a basis for environmental problem solving and action. This includes both sense of personal stake and responsibility, and self-efficacy. Instructional soundness means that EE materials should rely on instructional techniques that create an effective learning environment. The specific features referred to are learner-centered instruction, different ways of learning, connection to learners' everyday lives, expanded learning environment, interdisciplinary, goals and objectives, appropriateness for specific learning settings, and assessment (NAAEE, 2004).

For the DENR EE materials used in HumSS session plans, two materials were rated highly relevant while the two others were rated relevant. For the DENR EE materials used in STeM session plans, six materials were rated highly relevant and five were rated relevant (Table 6). These results imply that the DENR EE materials are pertinent resources for EE integration. Although many EE materials may be sought from the internet, those provided by the agency can be considered as reputable sources since they underwent rigorous development process, and since they were prepared by the experts.

The Content Courses in the Bachelor of Elementary Education include both HumSS courses (Language, Literature, Social Studies, MAPE and Values Education), and STeM courses (Mathematics, Science and Technology and Livelihood Education). Since the different DENR EE materials were found to be relevant to the topics covered by these courses, it can be said that these courses serve as appropriate and meaningful context of EE integration. In brief, this confirms that the Teacher Education program may be enriched by EE, making such program responsive to the current demands of the times amidst environmental crisis which support the findings for the Professional Education courses (Llenaresas & Llenaresas, 2016) and Specialization courses for

Bachelor of Secondary Education (Bercasio & Gayo, 2016). In other words, without additional separate stand along EE course, the pre-service teachers may be provided with the opportunities to become adept in environmental education, and consequently become environmental educators regardless of their disciplinal expertise.

Table 6. Assessment of DENR EE materials in terms of relevance to academic program

DENR EE Materials Used in Session Plans	Relevance to Academic Program		Over-all Results	Interpretation
	Action Orientation	Instructional soundness		
Session Plans for HumSS Content Courses				
1	3.50	4.25	3.88	Relevant
2	4.43	3.93	4.18	Relevant
3	4.36	4.20	4.28	Highly relevant
4	4.60	4.58	4.59	Highly relevant
Over-all	4.22	4.24	4.23	Highly relevant
Interpretation	Highly Relevant	Highly Relevant	Highly Relevant	
Session Plans for STeM Content Courses				
1	5.00	4.13	4.56	Highly relevant
2	4.36	4.20	4.28	Highly relevant
3	4.00	4.63	4.31	Highly relevant
4	3.91	4.01	3.96	Relevant
5	4.50	4.38	4.44	Highly relevant
6	3.50	3.59	3.55	Relevant
7	3.64	3.70	3.67	Relevant
8	4.43	3.93	4.18	Relevant
9	4.36	3.95	4.15	Relevant
10	4.60	4.25	4.43	Highly relevant
11	4.83	4.50	4.67	Highly relevant
Over-all	4.28	4.11	4.20	Highly relevant
Interpretation	Highly relevant	Relevant	Highly Relevant	

Flexibility for Integration

The flexibility for integration is an important characteristic of instructional materials. It refers to usability which means that the EE materials should be well designed and easy to use. This considers the following characteristics: clarity and logic, easy to use, long-lived (will last for a long time), adaptable, accompanied by instruction and support, make substantiated claims, and fit with national, state, or local requirements (NAAEE, 2004).

For the DENR EE materials used in HumSS session plans, two materials were rated highly flexible while the two others were rated flexible. For the DENR EE materials used in STeM session plans, six materials were rated highly flexible and five materials were rated flexible. Of the specific

characteristics, “making substantiated claims” was the only one rated flexible while the rest were rated highly flexible. Results imply that these are very good materials which can be used for EE in the teacher education courses, thus affirming the findings of Llenaresas & Llenaresas (2016) and Bercasio & Gayo (2016) for Professional Education courses, and Specialization courses, respectively, and even in other academic programs. On the whole, the flexibility of these materials imply that they are considered as reputable EE resources and that they were prepared through rigorous procedures. Such rigors indicate that the partners of the agency (DENR) in preparing the materials possess adeptness both in terms of content and instructional design. Ultimately, this indicates a worthy investment of the state in support of the law on national environmental awareness and education.

Table 7. Assessment of DENR EE materials in terms of flexibility for integration

DENR EE Materials Used in Session Plans	Flexibility for Integration	Interpretation
Session Plans for HumSS Content Courses		
1	4.57	Highly flexible
2	4.18	Flexible
3	4.18	Flexible
4	4.71	Highly flexible
Over-all	4.41	Highly flexible
Session Plans for STeM Content Courses		
1	4.29	Highly flexible
2	4.18	Flexible
3	4.57	Highly flexible
4	4.57	Highly flexible
5	4.52	Highly flexible
6	4.04	Flexible
7	3.90	Flexible
8	4.18	Flexible
9	4.57	Highly flexible
10	4.11	Flexible
11	4.62	Highly flexible
Over-all	4.32	Highly flexible

Validation of EE-enriched session plans in selected Content Courses

The proposed session plans (SPs) consisted of six SPs in Language courses, six SPs in Humanities courses, five SPs for Science courses, and five SPs for Mathematics courses (Table 8). In these 22 sample SPs, the EE integration included environmental principles specifically “All forms of life are important” and “Nature knows best”, proper waste management, and principles of sustainable development. A total of 15 DENR EE materials were used consisting of 13 print materials (brochure, flyer, fact sheet, booklets and books), one non-print material (music video) and one material produced during the EE training for the teachers. The EE integration occurs in the motivation, discussion or lesson proper and assessment parts of the lesson. The EE integration in these SPs can be considered as “greening the curriculum” (Emmanue & Ambe, 2014; Ajiboye & Ajitoni, 2008; Ormord & McClaren, 2014).

Table 8. Assessment results of session plans for Content Courses (HumSS and STeM) integrating EE concepts using DENR materials

Session Plan	Criteria					Over-all	Interpretation
	Learning Outcomes	Content (EE Integration)	Strategies/ Procedure	Assessment	Conventions		
HumSS Content Courses							
Languages Courses							
1	3.33	3.33	3.33	3.33	3.00	3.27	Excellent
2	4.00	3.33	3.33	3.33	3.33	3.47	Excellent
3	2.67	4.00	3.33	3.33	3.33	3.33	Excellent
4	4.00	3.67	4.00	4.00	3.33	3.80	Excellent
5	3.67	4.00	3.33	3.67	3.33	3.60	Excellent
6	4.00	4.00	4.00	3.50	4.00	3.90	Excellent
Over-all	3.61	3.72	3.56	3.53	3.39	3.56	Excellent
Interpretation	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Humanities Courses							
1	3.00	4.00	3.00	3.00	3.00	3.20	Very good
2	3.00	3.00	2.00	2.00	3.00	2.60	Very good
3	3.00	4.00	4.00	3.00	3.00	3.40	Very good
4	3.00	4.00	3.00	3.00	3.00	3.20	Very good
5	3.00	4.00	3.00	3.00	3.00	3.20	Very good
6	3.00	3.00	2.00	3.00	3.00	2.80	Very good
Over-all	3.00	3.67	2.83	2.83	3.00	3.07	Very good
Interpretation	Very good	Excellent	Very good	Very good	Very good	Very good	Very good
STeM Courses							
Science Courses							
1	3.67	3.00	3.33	3.67	3.67	3.47	Excellent
2	3.00	2.67	2.67	2.67	3.33	2.87	Very good
3	3.00	2.33	2.00	2.67	3.00	2.60	Very good
4	2.67	2.00	2.33	2.00	3.00	2.40	Good
5	2.33	1.67	2.33	2.00	2.67	2.20	Good
Over-all	2.93	2.33	2.53	2.60	3.13	2.71	Very good
Interpretation	Very good	Good	Very good	Very good	Very good	Very good	Very good
1	3.67	3.00	3.33	3.67	3.67	3.47	Excellent
2	2.67	2.00	2.33	2.00	3.00	2.40	Good
3	3.00	2.67	2.67	2.67	3.33	2.87	Very good
4	2.33	1.67	2.33	2.00	2.67	2.20	Good
5	3.00	2.33	2.00	2.67	3.00	2.60	Very good
Over-all	2.93	2.33	2.53	2.60	3.13	2.71	Very good
Interpretation	Very good	Good	Very good	Very good	Very good	Very good	Very good

The validation of these SPs considered Learning Outcomes, Content (whether the EE concepts were integrated), Strategies/Procedure, and Assessment, Conventions (correct usage, spelling and mechanics). As gleaned from Table 8, all the six SPs for Language courses were excellent in all the criteria while all the six SPs for Humanities courses were rated very good in terms of learning outcomes, strategies/procedures, assessment and conventions, and excellent in terms of content (EE integration). For both the five SPs for Science courses and five SPs for Mathematics courses, one was rated excellent, two were rated very good and two were rated good. Also, in terms of learning outcomes, strategies/procedure, assessment and conventions, these SPs were rated very good while in terms of content (EE integration), these were rated good.

These results reveal that the proposed lessons can be considered as sound curricular innovation in the Teacher Education program which maximize the utilization of the DENR EE materials. The use of the different DENR EE materials in these lessons has also proven the extensive utilization of such materials which the agency did not previously explore. These materials can serve as guide for teachers who would like to promote EE through the curriculum. Further, these results imply the rigors observed in the development and validation processes which involved both practitioners and experts to serve as SP writers and jurors. Clearly, these results indicate that the Teacher Education program, in this case the Content Courses for BEED, may serve as an appropriate context for EE thus further capacitating pre-service teachers as environmental educators and/or advocates. Consequently, with EE-enriched lessons, the Teacher Education program becomes more responsive to the needs of the times especially on environmental issues, and therefore becomes adherent to the laws specifically RA 9512 – National Environmental Awareness and Education Act of 2008.

CONCLUSION AND RECOMMENDATIONS

The integration of EE in the Teacher Education program is a strong support to the implementation of the National Environmental Awareness and Education Act most especially in the context of widespread environmental destruction. An initiative to enrich the Content Courses for the Bachelor of Elementary Education is a noteworthy endeavor in the higher education level which can be considered as “greening the curriculum” (Emmanue, & Ambe, 2014; Ajiboye, & Ajitoni, 2008; Ormord & McClaren, 2014), and as an attempt toward the deliberate integration of environmental concepts and principles in the various Teacher Education courses (Bercasio, 2017). Expectedly this requires the review of the curriculum, assessment of the existing DENR EE materials, and development and validation of lessons which were covered by this study. Based on the findings, the Content Courses include topics that allow for adequate EE integration in either in HumSS and STeM courses. Similarly, the DENR EE materials were found to be highly appropriate, highly relevant, and highly flexible, and therefore highly useful as instructional materials for the EE integration in the proposed lessons. Lastly, the proposed session plans deal on subject-matters in Languages, Humanities, Science and Mathematics in which EE integration can be mainstreamed in the motivation, discussion or lesson proper, and assessment of the lessons. These lessons which were rated very good or excellent serve as acceptable lessons for the mainstreaming of EE in the Content Courses. Given these, it is recommended that the validated lessons be pilot-tested to further validate and refine them. The preparation of a toolkit which will include the lessons, the DENR EE materials, and appropriate assessment tools is also highly recommended.

ACKNOWLEDGEMENT

The author acknowledges the support of Bicol University especially the Office of the Vice President for Research, Development and Extension, Publication and Knowledge Management Division, Center for Teaching Excellence, and the Department of Environment and Natural Resources.

REFERENCES

- Ajiboye, J. & Ajitoni, S. (2008). Effects of full and quasi-participatory learning strategies on Nigerian senior secondary students' environmental knowledge: Implications for classroom practice. *International Journal of Environmental Science Education*, 3 (2), 58-66.
- Bercasio, R. & Gayo, M. (2016) Assessment of environmental education materials for Specialization Courses in the Teacher Education curriculum. Technical Report. Bicol University, Legazpi City.
- Bercasio, R. (2017). Mainstreaming environmental education in the Teacher Education program. Legazpi: Bicol University.
- Emmanue, I. & Ambe, B. (2014). Influence of teachers, professional qualification and area of specialization on the implementation of environmental education curriculum in Cross River State-Nigeria. *International Conference on Chemical, Environment & Biological Science*. <http://dx.doi.org/10.15242/IICBE.C914120>.
- Llenaresas, H. & Llenaresas, M. (2016) Assessment of environmental education materials for Professional Education courses in the Teacher Education curriculum. Technical Report. Bicol University, Legazpi City.
- Monroe, M., Andrews, E., & Biedenweg, K. (2008). A Framework for environmental education strategies. *Applied Environmental Education & Communication*, 6(3-4), 205–216. <https://doi.org/10.1080/15330150801944416>.
- Ormond, C., et al. (2014). Environmental education as teacher education: Melancholic reflections from an emerging community of practice. *Canadian Journal of environmental Education*, 160-179.
- Republic Act 9512 – National Awareness and Education Act of 2008.
- UNESCO (1977) as cited in A Framework for environmental education strategies by Monroe, M. C., Andrews, E., & Biedenweg, K. (2008). A Framework for Environmental Education Strategies. *Applied Environmental Education & Communication*, 6(3-4), 205–216. <https://doi.org/10.1080/15330150801944416>.
- North American Association for Environmental Education (2004) Environmental education materials: Guidelines for excellence. Washington, D.C.: NAAEE. <http://resources.spaces3.com/3725a5c0-f0ab-4039-9bd2-c5dbd9bcb34f.pdf>.