The Analysis of Sustainable Development Content in the Syllabus of Environmental Knowledge and Plants Ecology Lecture

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Abstract. This research aims to find out how much the content of sustainable development exist in the content of environmental knowledge and plant ecology courses. The focus indicators of sustainable development indicators is the environment. This research is a qualitative research type with qualitative descriptive approach. The analyzed variables are only 2 courses, which are environmental knowledge and plants ecology. The results showed that the syllabus contents analysis of environmental knowledge and plants ecology courses in private Lembaga Pendidikan Tenaga Kependidikan (LPTK) in the province of Nusa Tenggara Barat is already good enough and the sustainable development contents is very large, almost all syllabus contents has already prioritize the sustainable development load of both the subject of environmental knowledge and plants ecology, although there are still some syllabus contents that was not includes sustainable development load, but the percentage is quite small, especially in the course of Plant Ecology.

1. Introduction

The environmentally sustainable development we use in this research is a very popular translation of "sustainable development" used in Western countries. [1]. Environmentally Sustainable Development is used in UU no. 23 of 1997 on Environmental Management. [2] Sustainable development and biodiversity has to be a key components in a nature-oriented curriculum. [3] Sustainable development describes a commitment to advance peoples’ welfare. [4] Sustainable development has a wide appeal and a small specificity, but several joint development and environment as well as equality are found in many attempts to describe it. [5] Sustainable development can also be done through formal education, not just informally. [6] Looking at the structure, scope, and application, the sustainable development is closely related to natural science and social science. [7] There are several countries in Asia applying sustainable development and successful in the implementation, those countries are Korea, Japan, India, Thailand and the Philippines. [8] The explanation above shows that the implementation of environmentally sustainable development is important to be implemented because it is closely related to the utilization of natural resources as an asset to realize people's welfare. In accordance with the rules mandated by the United Nations and the
European Union in 2007. [9] Given Sustainable development can not only be done formally and informally, the researchers tried to apply in the lecture system.

The lectures planned by a lecturer so that students can actively participate in the teaching-learning process that requires steps that are clear, systematic, and targeted. Unstructured lecture planning can be fatal, because the lecture does not reach the right target. Therefore it is very important for a lecturer in preparing the lecture also to re-analyze the weaknesses in the syllabus. To find out how much contents of sustainable development in the syllabus in several private LPTKs in the province of Nusa Tenggara Barat, researchers tried to analyze the examples of syllabus used, both in Lembaga Pendidikan Tenaga Kependidikan (LPTK) A, B and C.

Based on the description of the background above, the basis of researchers in conducting research and assessing, the extent to which contents of sustainable development in the syllabus in private LPTK in Nusa Tenggara Barat.

2. Experimental Method

2.1. Research method

The method used in this study is a qualitative method consisting of three private LPTKs namely A, B and C.

2.2. Research design

This research uses qualitative or naturalistic method because it is done in a natural condition. According to Creswell, qualitative research is a process of research and understanding that is based on the methodology of investigation of social phenomena and human problems. [10] This research begins by collecting the syllabus of several LPTKs in Nusa Tenggara Barat, then analyze how much of the contents of the syllabus that are about sustainable development.

2.3. Research subject and location

The research was conducted in three private LPTKs namely A, B and C located in Nusa Tenggara Barat.

3. Result and Discussion

From several syllabus formats used as an example of analysis, the following findings are outlined as (see table):

| Table 1. Environmental knowledge’s syllabus contents comparison about sustainable development |
|----------------------------------------|
| Syllabus Content                        | Sustainable Development Contents |
|                                        | 1 | 2 | 3 | 4 | 5 | 6 |
| Courses Contract and Review             |   |   |   |   |   |   |
| Environmental Characteristics           | ✓ | ✓ | ✓ | ✓ |   |   |
| Environmental Problems                  | ✓ | ✓ | ✓ | ✓ |   |   |
| Population and its’ Issues:             |   |   |   |   |   |   |
| - Dynamics Population                   | ✓ | ✓ | ✓ |   |   |   |
| - Population and Density Issues         |   |   |   |   |   |   |
| Ecology Concepts as the Basis of Environmental Knowledge: |   |   |   |   |   |   |
### Syllabus Content
- Populations, Community, ecosystem, habitat, nichia
- Biotic Tolerance Range (Alive)

#### Environmental Materials and Energy:
- Food Chains
- Food Webs
- Food Pyramids

#### Humans and Environments:
- Reciprocal relationship between humans with biotic and abiotic environments
- The impact of human activities on the physical, chemical, biological environments

#### Mid-Semester Test

#### Natural Resources and Environments:
- Types and Characteristics of Natural Resources
- Soil and Land
- The Exploitation of natural resources
- Mineral and energy
- The Management and Conservation of natural resources
- Damage to natural resources and environments

#### Health and Environment:
- Epidemiology of the disease
- Food contamination
- Environmental and health effects

#### Water and Soil Pollution

#### Air and Sound Pollution

#### Environmental Management Strategy

**Final Exam**

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**Note:** 1=Climate Change, 2=Energy, 3=Biodiversity, 4=Health and Environment, 5=Waste and Natural Resources, 6=Economy and Environment.

**Table 1 a):** Shows that the syllabus contents on the course of environmental knowledge has a very good sustainable development load. As can be seen from the contents of each meeting syllabus. But of all of the contents, there are still some contents existed that are not in accordance with indicators of sustainable development, which is the indicator of "climate change".

**b) LPTK B**

| Syllabus Content | Sustainable Development Contents |
|------------------|---------------------------------|
|                  | 1  | 2  | 3  | 4  | 5  | 6  |
| Courses Contract and Review |   |   |    |    |    |    |
| History of Environmental Science and Units in Ecosystems: Individuals, Population, Communities, ecosystem, and habitats | √  | √  | √  |    |    |    |
| Components and Functions of Ecosystems, and Concepts of Energy in Ecological System |    |    |    |    | √  |    |
Table 1 b): Show that the syllabus contents of environmental knowledge course in LPTK B has excellent sustainable development load level. As can be seen from the syllabus contents of each meeting, all syllabus contents is in accordance with indicators of sustainable development.

c) LPTK C

| Syllabus Content | Sustainable Development Contents |
|------------------|---------------------------------|
|                  | 1    | 2    | 3    | 4    | 5    | 6    |
| Succession       | ✓    | ✓    | ✓    |
| Definition and Types of Environments | ✓    | ✓    | ✓    |
| Types of environmental pollution and Source of pollutants | ✓    | ✓    | ✓    |
| The Impacts of environmental pollution and environmental pollution mitigation solutions | ✓    | ✓    |
| Mid-Semester Test | ✓    | ✓    | ✓    |
| Global environmental issues: acid rain, ozone holes, greenhouse effects, and global warming effects | ✓    | ✓    |
| Classification and Variety of Natural Resources and the Utilization | ✓    |
| Natural Resources Bio-conservation | ✓    |
| Food Chain, Food Web, and Food Pyramids | ✓    |
| Population Dynamics, Population and Density Issues, Effects of Population Density on Health | ✓    |
| AMDAL | ✓    | ✓    |
| Environmental Management Strategy | ✓    | ✓    |

Note: 1=Climate Change, 2=Energy, 3=Biodiversity, 4=Health and Environment, 5=Waste and Natural Resources, 6=Economy and Environment.
Table 1 c): Similar with the table A, the syllabus contents of environmental knowledge course on LPTK C has a very high sustainable development load level, but from all the content, there is still a syllabus contents that is not in accordance with the indicator of sustainable development, which is the indicator of "climate change".

Table 2. Plants ecology’s syllabus contents comparison about sustainable development

a) LPTK A

| Syllabus Content                        | Sustainable Development Contents |
|----------------------------------------|----------------------------------|
|                                         | 1  | 2  | 3  | 4  | 5  | 6  |
| Courses Contract and Review             |    |    |    | √  |    |    |
| Relation between plants ecology with another study subjects | √  | √  | √  |    |    |    |
| Plants Society                         |    |    |    |    | √  |    |
| Vegetation Classification               |    |    |    |    |    | √  |
| Plants Community                       |    |    |    |    |    | √  |
| Relation between Vegetation with Environment | √  | √  | √  |    |    |    |
| Mid-Semester Test                      |    |    |    |    |    |    |
| Terrestrial Biomes                     |    |    |    |    | √  |    |
| Vegetation Biomes in Indonesia         |    |    |    |    |    | √  |
| Vegetation Techniques and Analysis     |    |    |    |    |    |    |
| Final Exam                             |    |    |    |    |    |    |

Note: 1=Climate Change, 2=Energy, 3=Biodiversity, 4=Health and Environment, 5=Waste and Natural Resources, 6=Economy and Environment.

Table 2 a): Show that the syllabus contents of Plants Ecology course has excellent sustainable development load level. As can be seen from the syllabus contents of each meeting, although there is still a syllabus content that is not in accordance with indicators of sustainable development, which is the indicator of “Waste and Natural Resources”.
b) **LPTK B**

| Syllabus Content                                                                 | Sustainable Development Contents |
|----------------------------------------------------------------------------------|----------------------------------|
| **Courses Contract and Review**                                                   |                                  |
| Definition, ecological modelling, and ecological development of plants and their  |                                  |
| benefits and basic understanding in plant ecology                                | √                                |
| Plants in the environment (macro and micro), limiting factors and adaptation      |                                  |
| strategies                                                                        | √                                |
| Abiotic environmental factors: Light and its effects on plants                   | √                                |
| Abiotic environmental factors: light and atmosphere and its role for plants       |                                  |
| Abiotic Environmental factors: Temperature and effect on plants and adaptation    | √                                |
| strategies to extreme temperatures                                               | √                                |
| Abiotic Environmental Factors: Topography and soil and its role for plants,       |                                  |
| distribution and adaptation based on topography and soil conditions               |                                  |
| Mid-Semester Test                                                                |                                  |
| Biotic Factor and the Interactions                                               |                                  |
| Population and Distribution of Plants                                            |                                  |
| Vegetation and its characteristics; Method and Analysis of Vegetation             |                                  |
| Ecosystem                                                                        |                                  |
| Ecosystem Development (Succession)                                               |                                  |
| Terrestrial Ecosystem                                                             |                                  |
| Beach Ecosystem                                                                  |                                  |
| **Final Exam**                                                                   |                                  |

Note: 1=Climate Change, 2=Energy, 3=Biodiversity, 4=Health and Environment, 5=Waste and Natural Resources, 6=Economy and Environment.

**Table 2 b)**: Show that the syllabus contents of Plants Ecology course has excellent sustainable development load level. As can be seen from the syllabus contents of each meeting, although there is still a syllabus content that is not in accordance with indicators of sustainable development, which is the indicator of “Climate Change”.

c) **LPTK C**

| Syllabus Content                                                                 | Sustainable Development Contents |
|----------------------------------------------------------------------------------|----------------------------------|
| **Courses Contract and Review**                                                   |                                  |
| Definition, historical development of plant ecology,                             |                                  |
| Approaches of plant ecology                                                      | √                                |
| Environmental factors that play a role in plant ecology                          | √                                |
| Water and Fire as a limiting factor                                              |                                  |
| Organic and anorganic material in the soil as a limiting factor                  |                                  |
| Plants, Animals, Microorganisms, and Human as a limiting factor                  |                                  |
| Mid-Semester Test                                                                |                                  |
| Classification of the community, the concept of observing                        | √                                |
Syllabus Content | Sustainable Development Contents
---|---
the pattern of plant communities | 
Types of endemic and cosmopolite, Distribution with and without external help, Steps and Types of Succession | √
Vegetation of tropical rainforests, temperate deep forests, boreal forests, grasslands, tundra, dry arid zones and deserts, coastal forests, mangrove, freshwater plants, brackish water plants, estuariam, coral reefs | √
Types of Vegetation Maps and Data Collection Technique | √
Make the minimum area curve. And point and line methods | 
Quadratic and Quarter Methods | 
Density, frequency, dominance, importance, and ordination techniques | 
Application in agriculture, forestry and urban area development | 
Final Exam | 

Note: 1=Climate Change, 2=Energy, 3=Biodiversity, 4=Health and Environment, 5=Waste and Natural Resources, 6=Economy and Environment.

Table 2 c): Show that the syllabus contents of Plants Ecology course in LPTK C has excellent sustainable development load level. As can be seen from the syllabus contents of each meeting, all syllabus contents is in accordance with indicators of sustainable development.

4. Conclusion
Based on the results of the analysis that has been done, the conclusion obtained was that the analysis of syllabus contents of environmental knowledge and plants ecology in private LPTKs in Nusa Tenggara Barat is good enough and sustainable development load that is very large, almost all syllabus contents has already prioritize sustainable development load in the course of environmental knowledge as well as plant ecology, although there are still some syllabus contents that was not includes any sustainable development load, but the percentage is quite small especially in the course of plant ecology.

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