Student’s ecological intelligence ability on the environmental knowledge course

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Abstract. This study aims to determine the ability of the ecological intelligence of pre-service biology teacher in the course of environmental knowledge. This research includes qualitative research type with qualitative descriptive approach. The variables analyzed are the students' ecological intelligence ability, especially on the subject of environmental knowledge with the materials such as Environmental Characteristics, Ecological Concepts, Material and Energy, Human and Environment, Natural Resources and Environment, Health and Environment. The results showed that the ability of ecological intelligence of pre-service biology teacher in the subject of environmental knowledge was good enough. For the content aspect, the highest score is on ecological concepts, as well as human and environmental, by 85%. In the skill aspect, the highest score is on material and energy concepts that is 85%. While in the attitude aspect, the highest score is on the material of ecological concepts 86%.

1. Introduction
A good environment determines the quality of human life. To have a good environment, we are obliged to maintain a residential environment that is in some way aware of the environment and that maintains a behavior towards the environment [1]. All living things are very dependent on the environment because the environment is where living things retain all their biological activity [2]. Therefore, any form of effort that disrupts the integrity and sustainability of the environment must be minimized so that its abundant potential can be used in a sustainable manner, such as the hope of future generations facing global challenges towards better development [3].

Sustainable development and biodiversity are two essential components of environmental protection [4], [5]. Today's environmental problems, such as the shrinking of natural resources, air and water pollution, greatly affect human life [6]. Human behavior is the main source of environmental damage that threatens the quality of the environment and human life [7]. This is because some of the bad habits of human can affect the environment [8]. Ecological intelligence is a human ability that comes naturally to respond to the circumstances surrounding our environment. [9]. This shows that the capacity of ecological intelligence is important to apply in higher education because it is very close to the use of natural resources to achieve human well-being. [10] Based on the results of research conducted [11], it has been shown that ecological intelligence can be established and improved as students become aware of the importance of maintaining the environment in a sustainable society. In addition, according to [12],

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divulging the results of research in high school in Cimahi City shows that the level of ecological intelligence of learners varies between schools, from medium to high level. Viewed from the components of ecological intelligence, the attitude aspects have the highest score followed by aspects of knowledge, skills and participation. This shows that intelligence, especially ecological intelligence, can be influenced by the school environment, in this case the environmental school culture. Meanwhile, according to [13] revealed that ecological intelligence can be developed through several factors, one of which is Ecological Knowledge Sharing (EKS). Based on the above description of the background is the basis of researchers in the conduct of research and assess the extent students of biology ability in ecology intelligence.

2. Method

2.1. Research design and methods

The method used in this research is the qualitative method because it is done on natural conditions. According to creswell, qualitative research is a process of research and understanding based on the survey methodology of social phenomena. This research begins with the distribution of questionnaires and also the teaching process on Ecology Intelligence which consists of three dimensions, namely the content dimension, processing dimension and attitude dimension, and then analyzed how much intelligence ability of the students in environmental knowledge.

2.2. Research subject and location

This research took place at Biology Departement at Universitas Samawa (UNSA), one of the private universities in Sumbawa, Nusa Tenggara Barat.

3. Result and Discussion

This study uses a questionnaire for student’s ecological intelligence ability on the environmental knowledge course. The ecological intelligence questionnaire includes three indicators: content, skills and attitudes. From the results of the questionnaire and the analysis of the questionnaire, the main lines of the results is shown in figure 1.

![Figure 1: The ability of Ecology Intelligence](image)

Figure 1 shows that of the three components Ecology Intelligence in general is very good, the control of the material in the context of the knowledge of the environment is also very good, seen from the graph above.
Table 1. Scores of Environmental Knowledge Content

| The subject of knowledge the environment                                      | Score Minimal | Score Maximal | Mean ± Standard deviation |
|-------------------------------------------------------------------------------|---------------|---------------|---------------------------|
| Environmental Characteristics                                                | 10            | 15            | 13,40±2,75                |
| Ecological Concepts                                                           | 13            | 15            | 14,20±0,68                |
| Material and Energy                                                           | 13            | 15            | 14,47±0,74                |
| Human and Environment                                                         | 13            | 15            | 14,20±0,68                |
| Natural Resources and the Environment                                         | 12            | 15            | 13,20±1,66                |
| Health and Environment                                                       | 14            | 15            | 14,80±0,41                |

Table 1 shows that the average score on environmental knowledge is very good. The highest score on health and environmental materials with a maximum score of 15, a minimum score of 14 with an average score of 14.80.

4. Conclusion

Based on the results of the analysis that was made to conclude that the student biology student candidate capacity in ecology is very good, the three dimensions measured are: content, skills and attitude. Students as future teachers have few answers to the circumstances surrounding their environment and show a good attitude that ecological intelligence is important to implement. The capacity of students' ecological intelligence in particular in the field of environmental knowledge consists of several materials, namely: environmental characteristics, ecological concepts, materials and energy, human and environment, natural resources and environment, health and environment. The results showed that the biology student's ecology intelligence ability in the subject of environmental knowledge was quite good. For the highest score content is on the material of ecology, the human and environmental concepts of 85%, on the aspect of the highest skills are on the material and energy concepts of 85%, while the highest aspect the ecological concept is 86%.

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