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**Training Students’ Attitudes in** **Environment Science Lecture**

**Through Lesson Study**

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**Abstract**

Environment science lecture is a lecture which is programmed for second semester students. This lecure consists of 3 credit semesters (SKS). In this lecture, the core competence to be achieved is to communicate and to understand the concepts of natural resources and environment, to solve related problems, and to have an environmental awareness. To date, the environment science lecture is still focused on knowledge and skills. The affective ompetence (attitude) has not been continuously trained, therefore, this lecture needs to train students’ attitudes to support their environmental awareness competence. The purpose of this research was to evaluate how to train the attitudes of biology education study program students in the second semester who were taking the environment knowledge lecture. This purpose was to explore the learning process of environment science lecture, to train the attitudes related to the environmental awareness in addition to training concepts and skills, as well as the results of the attitude assessment during the learning. The method used in this research was quantitative and qualitative interpretation research by observing the learning process of Biology education students. The research stages include plan, do, and see. During the plan stage, lecturers and team and lecturers of other subjects designed and discussed the lesson plans; do stage, the implementation of the lesson plans on the material of environment and population issues for two meetings; see, observations during the learning process by observers from teams and lecturers of other subjects, and reflections on the results of observations and the learning process. The collected data covered the results of observation on the learning process by the observer, the lecturers’ assessment related to the skills and attitudes during the learning process, and the students’ self assessment on their attitudes. The data were descriptively analyzed. The research results related to plan were changing the structure of the lesson plans, clarifying the indicators and learning objectives, and not yet entering the quiz component in the lesson plans using STAD cooperative learning model. The implementation of the learning. In Do and See, what had been good from the observation was the implementation of the lesson plans, the steps of learning were implemented according to the lesson plans designed, the students learned actively, they cooperated within groups, the class cleanliness was an indicator of attitude to environmental awareness because the lecturers always reminded the students related to the indicators of keeping the environment clean and treating garbage, the learning resources used challanged the students to work and discuss. What needed to be improved from the learning was the provision of time limit in finishing the tasks, so that when the students were performing presentation, no students were still working on their tasks, the students should have received clear instructions related to cooperation within the group because there were two groups that were still sharing the work in completing the tasks, and there should have been a poster related to attitude to environmental awareness. This research indicates that students’ attitudes towards environmental awareness are categorized as good - very good, the results of the lecturers’ assessment of the attitudes are cataforized as good, and results of the students’ presentation skills are catagorized as good - very good.

Keywords: [Lesson study](https://translate.google.com/translate?hl=id&prev=_t&sl=id&tl=en&u=http://www.emeraldinsight.com/keyword/Lesson%2BStudy) , Environmental Science, environmental awareness

**INTRODUCTION**

Environment science is a required lecture in the second semester programmed for the students majoring in biology, including biology study program. Environment science lecture has 3 credit semester. The learning process of environment science lecture was carried out in face to face theory, tutorial, and practicum. In this lecture, the core competence to be achieved is to communicate and to understand the concepts of natural resources and environment, to solve related problems, and to have an environmental awareness. So far, it is more focused on the learning which directs the students to develop concepts and to train skills, while the environment awareness has not been much trained. Thus, environmental awareness has not become a culture. Although the focus of this research was on how to train environmental awareness attitude, the students were also taught about the concept / knowledge and skills as capital in attitude.

Knowledge is the initial capital that an individual shoul have. The development of individual knowledge can be used to connect facts or information from various sources and draw conclusions. From these knowledge and skills, an individual will be able to take actions to solve environmental problems and to have an attitude from that action, for example the environmental awareness attitude. Presentation skills that are part of communicating which are trained in this research as belief or action. (Filsaime, 2018). It means that the students who are given the opportunity to do presentation will become confident and will have an important role in learning. Therefore in learning, the three aspects related to knowledge, concepts, and attitudes are the parts that need to be taught and trained comprehensively. The attitude which was trained in this research was the environmental awareness attitude, which means the attitude and actions that prevent environmental damages and the efforts to improve the environment quality (Kemendiknas, 2010; Kresnawati, 2013). The action to protect and manage the environment as an expression of love for the environment (Aini, 2008).

From the results of the problem identification, it was known that the affective competence (attitud) has not been continuously trained, therefore, this lecture needs to train students’ attitudes to support their environmental awareness competence. The purpose of this research was to evaluate how to train the attitudes of biology education study program students in the second semester who were taking the environment science lecture. This purpose was to explore the learning process of environment science lecture, to train the attitudes related to the environmental awareness in addition to training concepts and skills, as well as the results of the attitude assessment during the learning. To achieve the objectives of the research, this research was conducted through lesson study with the aim of developing the students’ environmental awareness through learning community, especially the establishment of the interaction between students and environmentm, in addition to the interaction between students and students, and between students and teachers (Rachmadiarti and Fitrihidajati, 2017). While Lewis et al. (2006) suggested that the cycle of a lesson study starts with the teachers (lecturers) work by establishing the main objectives during the implementation of the lesson plan.

**METHODOLOGY**

This research was conducted to investigate the interaction between students and the environment, between students and students, and between students and lecturers. The implementation of the learning was carried out through lesson study, that is, the lesson plan was made together with ecology team, and the learning in the class involved other team as an observer.

***1.*** ***Class and*** ***l*** ***ecture*** ***of participants***

The class used for the implementation of learning in this research was the class of Biology Education 2014. The lecturers who participated in developing the lesson plan consisted of 3 lecturers of ecology subjects. While the lecturers who participated in the observation of learning and reflection of learning consisted of 2 lecturers from ecology team, 3 lecturers from other courses and one guest lecturer, along with two lecturers from other courses.

***2. Data collection***

The learning activity was carried out for 2 meetings with each meeting consisting of 2 learning period and two reflections. For analysis purposes, the findings of lesson study were divided into two stages: stage 1 consisted of plan 1, do-see 1, reflection 1 and stage 2 consisted of plan 2, do-see 2 reflection 2. At the do-see stage, the learning process was carried out, during the learning process, an observation was carried out. The results of observations including the student activities and learning processes were recorded by the observers, including the students’ work and the students' ability to present the results of the discussion. After the learning process, the assessment was conducted. The assessment was conducted to assess the presentation skills and self-assessment for the environmental awareness attitude.

***3.*** ***Data Analysis***

The data collected included: 1) the results of the observation on student activity and learning processes that occured during the learning process, including problems and solutions to the problems; 2) the assessment of presentation after the learning process; and 3) self-assessment related to the environmental awareness attitude. observation to the learning students and reflection note during the lesson. Observations were measured by looking at the number of the observation results, comments and solutions during and after the learning process; The Data were Analyzed descriptively.

**RESULT AND DISCUSSION**

This research Began with the stage of **plan,** where lectures and team developed lesson plans. They developed two lesson plans for two meetings appearances for 100 minutes. Box 1 presents the feedback on the lesson plan from the lecturers from other teams who were present during the Plan.

Box 1. Input from Lecturer Observer toward Lesson Plan

1. need to be clarified in the lesson plan the connection between the environmental issues and the topics to be studied, namely growth of population
2. the word “audience” in the basic competencies needs to be eliminated. “audience” is written in the learning objectives.
3. In the lesson plan communicating is clarified with presenting results as one of the skills to be assessed.
4. The point of summarize learning material which is done together between the lecturer and students should be written the material which needs to be summarized and underlined in the learning.
5. The indicator of presentation should be made in order that the students can inplement the presentation according to the expectation in basic competence
6. A non-formal observation of environmental awareness attitude is needed on the eco campus activities

Plan is very useful in improving the lesson plan that will be implemented in the learning because there are some feedback to improve the learning, namely the delivery of presentation indicators on the students and make non-formal observations on students while doing environmental awareness activities. This presentation is important, because through presentation, the students’ understanding of the learning material can be quickly identified.

The next stage is the ***Do-see.*** At this stage learning and observation of learning were conducted. The results of the learning observation are presented in Table 1a and 1b.

Table 1a. The completeness of the mplementation of the lesson plans (RPP)

|  |  |  |  |
| --- | --- | --- | --- |
| No | Learning steps | Completeness | |
| Meeting 1 | Meeting 2 |
| 1. **Opening** | | | |
| ***Phase 1: Presenting the learning objectives and motivating students*** | | | |
| 1 | Reviewing the previous learning material on environmental issues (environmental issues, environmental pollution issues by questions and answers) | 100% | 100% |
| 2 | Displaying the slides of environmental pollution, human population, and asking students to observe and give comments on the | 100% | 100% |
| 3 | Stating the learning objectives (cognitive, psychomotor, affective), including environmental awareness attitude and cooperation. | 100% | 100% |
| **B. Main (100 minutes)** | | | |
| 1 | ***Phase 2: Presenting information***  Students pay attention to the lecturer presenting environmental pollution cases, human population growth and the affecting factors | 100% | 100% |
| 2 | ***Phase 3: Organizing students into study groups***  Students are instructed to sit in groups and to read the student worksheet (environmental polution, changes in the survival rate of US pop) provided | 100% | 100% |  |
| 3 | ***Phase 4: Guiding group work and study***  Students read the worksheet carefully and ask questions about the things they do not understand while reading the student worksheet | 100% | 100% |  |
| 4 | The lecturer asks the students to do the student worksheet by discussion | 100% | 100% |  |
| 5 | The lecturer guides the discussion in working on the student worksheet | 100% | 100% |  |
| 6 | ***Phase 5: Presenting the results of the discussion***  The students and their groups present the results of the discussions classically guided by the lecturer | 100% | 100% |  |
| 7 | The students and the lecturer summarize the learning material related to lab work | 100% | 100% |  |
| 8 | ***Phase 6: Giving Reward***  Lecturer gives reward the group with the best performance | 100% | 100% |  |
| **C. Closing** | | | |  |
| 1 | The lecturer and the student summarize the learning materials on environmental pollution and population | 100% | 100% |  |
| 2 | The lecturer gives gives an assignment to study about the next material, which is environmental management | 100% | 100% |  |

Table 1a illustrates that the completeness of the implementation of the lesson plan is 100%. All the stages in the learning activities designed on the lesson plan had been implemented. The learning condition was also supported by the results of the observation of the learning which is reflected in the *see* activity (table 1b).

 Table 1b. Summary of the Observation Results

|  |  |  |
| --- | --- | --- |
| **No** | **Observer** | **The results of observation** |
| 1 | 1 | * students discussed and corrected mistakes with presentations * Students listened to the topic and did the work * Students listens, and pay attention to pictures (phase 1) * Students listen and pay attention to Power Point Presentation * When summarizing, the students should not stand, but sit still in their seat. |
| 2 | 2 | * Group 1,2, 3 (still working on their own work when one of the other groups sstep forward). The lecturer should make sure the group work has finished. * One student, when the lecturer explained the material, was not concentrated. Lecturers needed to remind the students who were busy working on their own. |
| 3 | 3 | * Some of the students were not yet concentrated at the begining of the class. After given the student worksheet, the students became more active in discussions and did the student worksheet * Because there was not a clear time limitation for finishing the worksheet, the lecturer should have provided the allocation time for finishing the worksheet and discussion |
| 4 | 4 | * Always gave questions and slides * Group discussion * Motivated, guided and asked about the difficulties that the students experienced * Often visiting student groups and often having discussions with them, so that it encouraged the passive students to become more active * Visiting each group, and checking their progress on the task * Reminding about environmental awareness and cooperation * Spook English fluently and well. |
| 5 | 5 | * Dare to learn in English. * The availability of the worksheet eased the students and teachers in learning. * Working in groups, good language, confident. * Clean class. |

Table 1b shows that students studied actively. Listened and paid attention to the lecturer, did the student worksheet. Having discussions and doing presentations, although some students were not concentrated at the begining of the class. Students learned in groups with the worksheet written in English as the learning resources, the students were confident in doing presentations in English. In addition, the students could work with their friends in one group and show an environmental awareness attitude, which was indicated with the clean classroom. Such condition is supported by a model lecturer who frequently visited and guided each group, by asking the difficulties they experienced. In addition, the lecturer had good English Speaking competence. To monitor the students’ environment awareness and cooperation, the students did self assessment (Table 2).

 Table 2. Self Assessment of Attitude

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Assessed aspects | Assessment Percentage | | | |
| K | C | B | SB |
| 1 | Cooperation |  |  | 22% | 78% |
| 2 | Environment awareness | | | | |
| 1. Keep the environment cleanliness |  |  | 22% | 78% |
| 1. Treat rubbish |  |  | 28% | 72% |

Assessment rubric

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Assessed aspect | Assessment | | | |
| K | C | B | SB |
| a. | Keep the environment cleanliness | The surroundings of the students are not clean | The surroundings of the students are not clean, still often reminded by teachers | The surroundings of the students are always clean, still need to be reminded by the teacher | The surroundings of the students are always neat and clean, done independently |
| b. | Treat rubbish | Do not put rubbish on the rubbish bin | Rarely put rubbish in the rubbish bin | Always put the rubbish i the rubbish bin, but not in accordance with its type | Always put the rubbish in the rubbish bin according to its type |

An evaluation was carried out at the end of the learning by asking each group to do presentations, and the results of the assessment are presented in Table 3.

 Table 3. Presentation Assessment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| No | Assessed aspects | Group / Score | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | Mastery of the science concepts delivered | 3 | 3 | 3 | 3 | 4 | 4 |
| 2 | Presenter performance | 4 | 3 | 3 | 3 | 4 | 4 |
| 3 | Presentation display | 4 | 4 | 3 | 3 | 4 | 4 |
|  | Average | 3.66 | 3.33 | 3 | 3 | 4 | 4 |

Assessment rubric

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Assessed aspects | Score | | | |
| 1 | 2 | 3 | 4 |
| 1 | Mastery of the science concepts delivered | Not mastering the concept of population very well, the terms used are not correct | Lack of mastering the concept of population, the terms used are less precise | Mastering the concept of population well, the terms used are correct | Mastering the concept of population very well, the terms used are correct and precise |
| 2 | Performance | The delivery is not easy to understand, not communicative with the audience, not give the audience an opportunity to think | The delivery is not easy to understand, less communicative with the audience, giving less opportunity for the audience to think | Delivery is easy to understand, communicative with the audience, giving less opportunity for the audience to think | Delivery is easy to understand, very communicative with the audience, giving the audience an opportunity to think |
| 3 | Presentation display | The displays are unattractive and not suitable with the material | The displays are less attractive and less suitable with the material | The display look attractive but less suitable with the material | The displays are very attractive and suitable with the material |

The students who had conducted self-assessment related to collaboration and presentation assessment by lecturers were also observed related to student activities during learning and the results were in line with the two things (Table 4). Table 4 shows that students were active in learning, group work, applying scientific attitudes, and direct involvement in presentations.

 Table 4 Results of Student Activity Observation

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Aspect of Assessment | Assessment criteria | Group | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1. | Activeness in learning | 3. Students are active, earnest and do not show any irrelevant behavior  2. Students only show the two behaviors mentioned above  1. Students show less than the above two behaviors | 3 | 3 | 3 | 3 | 3 | 3 |
| 2 | Group work | 3. Students are active, discussing with their group members, not dominating and respecting others’ opinions  2. Students only show the two behaviors mentioned above  1. Students show less than the above two behaviors | 3 | 3 | 3 | 3 | 3 | 3 |
| 3 | Application of scientific attitude | 3. Students are thorough, honest and responsible during the observation activities  2. Students only show the two behaviors mentioned above  3. Students show less than the above two behaviors | 3 | 3 | 3 | 3 | 3 | 3 |
| 4 | Involvement during presentation | 3. Students dare to express opinions, appreciate others’ opinions and pay attention to the presentation activities  2. Students only show the two behaviors mentioned above  3. Students show less than the above two behaviors | 3 | 3 | 3 | 3 | 3 | 3 |
| Scores gained | | | 3 | 3 | 3 | 3 | 3 | 3 |

DICUSSION

Lesson yang dikembangkan antara tim teaching bersama-sama dengan dosen-dosen yang hadir saat plan dapat dilaksanakan tahap demi tahap sesuai dengan sintaks pembelajaran kooperatif (Ibrahim, et al. 2000). Yang terpenting dari keterlaksanaan lesson plan ini adalah kolaborasi yang baik dalam tim teaching dan antara dosen-dosen yang hadir dalam kegiatan plan. Hal ini sesuai dengan tahapan dari siklus lesson study (Hendayana, et al., 2007; Suratno and Cock, 2009). Pada tahap lesson plan ini, dosen-dosen dengan pengetahuannya bersama-sama berkerja sama mengkonstruksi lesson plan menentukan pembelajaran terbaik untuk mahasiswa, mendiskusikan tugas-tugas mahasiswa, dan kesempatan mendiskusikan secara detil bagaimana mahasiswa berpikir dan how best to further the understanding of student thinking ([Fernández, 2010)](http://www.emeraldinsight.com/doi/full/10.1108/IJLLS-11-2015-0037).

Pada penelitian ini, kemampuan akademik mahasiswa dipotret dari kemampuan komunikasi, yaitu dari kemampuan mempresentasi yang dilakukan secara berkelompok. Dari presentasi dapat dilihat, selain kemampuan komunikasi juga kemampuan penguasaan konsep dari materi yang disajikan, sebagai contoh pada materi kependudukan selain mahasiswa mampu mempresentasikan materi/konsep/implementasinya dari indikator presenter perfomance dan presentation display, yaitu mendeskripsikan penduduk dan faktor-faktor yang mempengaruhinya termasuk dampak kependudukan pada lingkungan yang salah satunya menyebabkan pencemaran linkungan, mahaasiswa juga telah memahami konsep yang dipresentasikan dari bukti salah satu skor penilaian presentasi, yaitu mastery of the science concepts delivered. Kenerhasilan dari sisi konsep dan komunikasi mahasiswa tidak lepas pula dari interaksi mahasiswa dengan mahasiswa baik dalam kelompok saat mengerjakan dan mendiskusikan LKM, interaksi antar kelompok saat presentasi (Rachmadiarti and Fitrihidajati, 2017)

Perkembangan dan keberhasilan mahasiswa telah muncul dalam pembelajaran mata kuliah pengetahuan lingkungan, yaitu kemampuan akademik dan sikap selama belajar, yaitu kepedulian terhadap lingkungan. Perkembangan dan keberhasilan ini karena Dosen dan tim telah bertindak sebagai fasilitator yang baik. Hal ini dapat terjadi karena adanya pengetahuan ko-konstruksi dalam tim dosen menyebabkan pembelajaran yang dilakukan pada mahasiswa menjadi lebih baik (Siu, 2007). Selain itu dengan perencanaan bersama, dosen juga membuat kemungkinan untuk expansive learning (Engestrom, 2001), di mana mahasiswa belajar sesuatu yang sebelumnya belum dipelajari dan terlibat dalam mengkonstruk dan mengimplementasi (Engestrom and Sanino, 2010). Kondisi inilah yang dapat memacu mahasiswa berhasil dalam belajar dan bertindak (sikap peduli lingkungan).

CONCLUSION

This research conclude that students’ attitudes towards environmental awareness are categorized as good - very good, the results of the lecturers’ assessment of the attitudes are cataforized as good, and results of the students’ presentation skills are catagorized as good - very good.

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