

Application of Learning Method Small Group Discussion (SGD) in Seed Pathology

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ABSTRACT

Seed pathology is one of the elective courses in Plant Protection Departement. Seed pathology studies about plant diseases transmitted through seeds, the mechanism of infection in seeds, survival time and factors that affect the survival of pathogens in seeds. The number of topics taught in the course can be quite a challenge for students. To follow up on this problem, a learning strategy is needed in accordance with characteristics of subject contained in seed pathology. Small Group Discussion (SGD) learning method approach is expected to be a solution to problems above. Development of learning methods conducted in this study is method of learning in SGD. In this approach, discussions in small groups about material are planned at the initial meeting. These small groups of students will present the results of their discussion (according to topic of lectures every week), other designated groups will ask a number of questions related to material presented, subject matter is focused on the activeness of each student, lecturer act as motivators and facilitators. Results showed that application of SGD learning method: 1) can improve students' understanding of seed pathology, 2) can improve student learning achievement for the better, which can be seen in the value distribution of student score that is close to the normal distribution curve.

Keywords: *Seed pathology, small group discussion, development of learning methods*

1. INTRODUCTION

Curriculum in Plant Protection Departement has 144 credits (SKS) and are distributed in 8 semesters. Curriculum is carried out with reference to the National Higher Education Standards (SN-DIKTI). The curriculum includes compulsory and elective course, with proportions: compulsory course 105 SKS (72.91%) and elective course 39-67 SKS (22.67 - 27.08%). Elective course in Plant Protection Departement is based on input from various stakeholders who demand that desired graduate profile is able to apply crop protection in various fields of agriculture, and they are able to complete identifying, analyzing and solving problems related to plant diseases. Seed pathology is one of elective courses contained in curriculum structure. Seed Pathology is a course that studies plant diseases transmitted through seeds, mechanism of infection in seeds, survival time and factors that affect survival of pathogens in seeds,

detection of seed-borne pathogens in seed, patterns of spread of seed-borne pathogens and countermeasures. Learning objectives of this course are so that students can: (a) explain the importance of disease in seeds and losses due to diseases that attack seeds, various concepts of seed pathology and factors that influence it, and (b) students can find out control methods due to pathogenic infection in seeds.

As one of the courses supporting main competencies of Plant Protection Departement, seed pathology must be well and correctly understood by students. It will provide students with an understanding of theories and applied concepts related to integrated disease control processes in an environmental-friendly way. Topics in Seed Patahology includes how to analyze disease progression based on determinants that can spur emergence of diseases such as host plants, pathogens and environment. The number and complexity of the

topics as well as different characteristics of students make learning process difficult to achieve especially in accordance to final competencies formulated by the study program [1]. To follow up on this problem, a learning strategy is needed in accordance with characteristics of subject contained in Seed Pathology subject *Small Group Discussion* (SGD) method approach is considered appropriate to be developed in teaching and learning process. Teaching materials currently available are power point slides, handouts, lectures and reference books. Learning methods that have been applied so far have begun to be developed towards **Student Center Learning (SCL)**, where students are given topics related to lecture material and examples of cases of disease in some plants that are found in farmers' fields with different environmental conditions. Students are divided into small groups (3-5 student), Each group will have their respective functions and duties. However, from the results of evaluation carried out it is known that some students still do not understand how to analyze available data to be used a basis in determining appropriate method of disease control, Therefore, SGD method is expected to be a solution to above problem [2].

Assessment system for students has been conducted so far based on completion criteria of structured assignments and practice (30%) and evaluation through Mid Term Exam (UTS) (35%) and Final Exam (UAS) (35%). Application of assessment system still needs to be refined, because assessment criteria are more dominant than results of mid and final exam. Assessments of weekly activities are still general so it needs to be formulated in detail so that weight of assessment of each activity during lectures also contributes to determine student's final score. In last semester, (2018/2019) student scores did not spread normally, the largest percentage of student scores were A- (27.9%) and C (23.2%). From evaluations carried out, students were concerned about not being able to understand exam questions and assignments given. Variation in scores obtained by students showed diversity in carrying out teaching and learning process. Outcome of the proposal are: **a)** Semester Learning Plan Document (RPS) using SGD method, **b)** articles presented at the International Conference on Educational Development and Quality Assurance III (ICED-QA III) which will be held by LP3M Andalas University in October 2020.

2. METHODS

2.1. Contents of the Semester Learning Document (RPS)

This proposal proposes a change in learning

methods to improve quality of lectures by improving teaching and learning processes. In last semester, lectures were carried out for 14 weeks, then assessments were conducted through Mid Examination (UTS), Final Examination (UAS) and Examination Practice. Criteria for evaluating structured assignments related to weekly lecture topic have not been defined in detail and active role of students in discussion, students ability to understand learning material could only be known after final learning process. The problem is that lecturers do not have time to fix students weaknesses. Therefore, it is proposed that we change the way of delivering learning material as stated in new semester learning plan. Changes in the way learning is focused on how students who are divided into small groups are able to find and collect learning materials that has been prepared previously. Each group is required to deliver each learning material to all students and proceed with two-way discussion. Learning and evaluating learning outcomes process are made into a learning assessment system. Learning assessment will cover the knowledge, skills and attitudes of students.

SGD method is a learning process by conducting small group discussions that aims to have students skills to solve problems related to subject matter and problems faced in field. It is expected that application of SGD method can: 1) increase active participation of students in learning, 2) provide learning about leadership and group decision making experiences, 3) provide opportunities to interact and learn with other students with different backgrounds. SGD methods will provide maximum results when prepared thoroughly and seriously. Matters that must be prepared include: determine topic of discussion, prepare preliminary information, prepare yourself as leader of discussion, determine size of group members, arrange the room and seating. Group-based learning is a multilevel learning process using topic as a medium of learning. There are three levels in SGD method, namely individual, group and class levels. these levels can be explained as follows: 1) At individual level, a person is given task to understand a topic of discussion. The individual will use his knowledge and sources of reference he has to do tasks. After going through individual learning phase, he can start learning at group level. Group members will discuss and exchange ideas about each frame of reference in same topic. Each person will explain reason why he uses a frame of reference and present information he has to explain the topic. 2). Final learning is at classroom level where a facilitator (lecturer) will help each class member to place their terms of reference into a more systematic theoretical and conceptual framework and also help to identify and use research results related to topic being discussed.

3. RESULTS AND DISCUSSION

3.1. *Development of Learning Methods.*

Learning methods for seed pathology carried out so far still have been semi SCL methods. A lecturer gives questions to students regarding topic requested to be studied at the next meeting and the student is asked to explain the answer in front of class and the answers submitted by student concerned will be responded to by other students. This method was applied at the initial meeting of seed pathology in the 2019/2020. From the evaluation conducted, this method was found to be less effective in making all students active. From observations made, it was found that there were quite a lot of students who did not study topics requested and also quite a lot of students who had studied but did not understand topic. In addition, because the classes taught are generally relatively large (> 30 students), lecturers do not have sufficient opportunities to encourage students to discuss and assess activeness of each student. Another problem found is that not many students used the opportunity to ask material being discussed, even though lecturers provides enough opportunities for students to discuss material being discussed, both to ask questions and to respond to material discussed. Consequently, lecturers cannot make an assessment of the whole process. In addition, in the implementation of previous learning, there was no activity plan in tutorial activity that can be used as a guide for students in activity. From description above, it can be said that learning with semi SCL has not been effective enough in activating students. Learning outcome data which were evaluated in previous years, indicate that student learning outcomes in learning seed pathology correlate with their activity in learning process. Students who get good grades, generally are students who show their activity in learning process. Conversely, students who get poor grades are students who are less active in discussing, asking, responding and being involved in completing assignments both in lecture activities and in practical activities. Therefore, it is necessary to make improvements to learning methods carried out. Development of learning methods conducted in this study is SGD. In this approach, discussions in small groups about the material were planned at initial meeting. These small groups of students will present results of their discussion (according to topic of lectures every week), other designated groups will give a number of questions related to the materials presented. Activeness of each student is encouraged. Lecturers only act in explaining contents of topic in general as well as expected learning outcomes. He or she acts as a motivator and facilitator in these activities and also in assessing the subject of

discussions. With this approach, subject participants will be divided into small groups of 4-5 people. With number of subject participants as many as 38 students, there are 8 groups. In division of groups it is sought that each group consists of students with sufficiently diverse academic abilities. In other words, the group must consist of students with excellent, good, moderate, and poor abilities. Basis for division of groups is prerequisite subject grades such as agricultural microbiology and plant diseases and basics of plant protection. All group members will take turns presenting parts of topic assigned to the group in the form of power points and hard copies of topics. At planned meeting, all groups discussed materials they had previously learned. Topics chosen to be delivered are the ones contained in RPS. The material that must be completed in seed pathology is very dense. Therefore, in each meeting, examples of problems related to disease development provided as illustrations are very limited. Development of Semester Learning Plans (RPS), including Facilities and Learning Media Improvements of seed pathology course were carried out in the Even semester 2019/2020. Some of improvements made are:

A. Background of the Subject.

A description was added that the learning method used is SGD method, where each group that has been determined is asked to make presentation materials related to lecture topic every week and have a discussion with other groups.

B. Learning Activity Plan

SGD learning method applied requires each group member who presents material in front of class to be actively involved in the form of submitting sub- chapters of discussion material listed on RPS. In this new RPS, assessment of students is more detailed . There was also a change in the proportion of valuations for each.

Assessment items are as follows:

Proportion of student final grades

Presentation (15%)

Final Exam and Final Exam (60%)

Practice (2%)

Structured assignments (5%)

C. References

More reading materials that students can use as a source of information and references are added and updated. Sources of reading materials can be obtained from various sources both in the form of hardcopy or softcopy.

3.2. Classroom Action Research and Discussion Results

This section will describe the results of Classroom Action Research (CAR) for seed pathology in even semester 2018/2019 and evaluate class action research activities. Some parameters used to evaluate the success of CAR are carried out are success of learning achievements, distribution of final grades and student responses [3]. In addition to Semester Learning Plans, we also developed learning kit, which is in the form of Class Discussion Sheets. Class Discussion Worksheet is a guide for students

to carry out class discussions. In this developed learning method, no new learning technology will be added. Lecture material will still be delivered using a whiteboard and power point presentation slides, but this lecture material will be delivered in the last session of the discussion to provide an appropriate understanding of topics discussed on that day. This method is considered to be quite effective and efficient and can reduce errors in understanding lecture material as compiled in RPS. Comparison of distribution final students score can be seen in **Figure 1,**

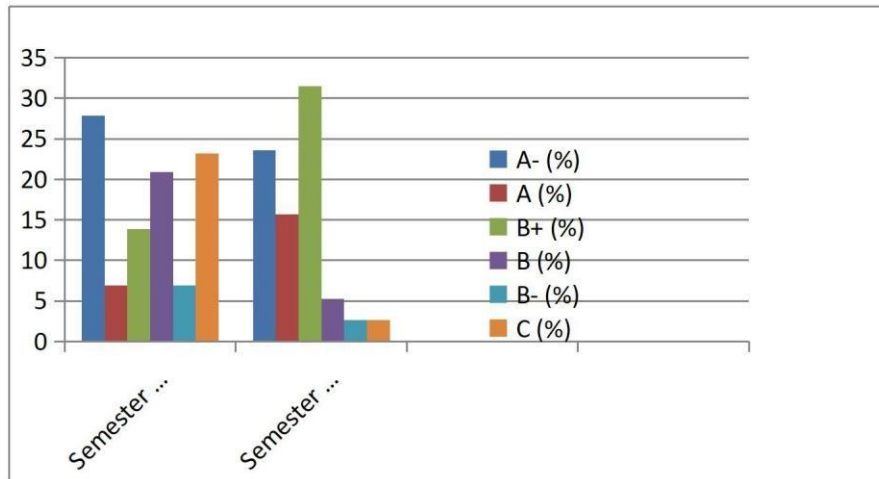


Figure 1. Comparison of distribution of student scores in seed pathology in 2018/2019 and 2019/2020

There was an increase in student’s grades after the learning methods SGD was applied in lectures compared to the distribution of final score in last semester (2018/2019). It can be seen distribution of Ascore increased from 6.9% to 15.7%, B + increased from 13.9% to 31.5%, while the C score decreased from 23.2% to 2.6%

4. CONCLUSION

Conclusions of this study are as follows:

- 1) The application of SGD method for seed pathology can improve student’s understanding of concepts and the analysis of plant disease development that can be used as a basis for determining methods of controlling plant diseases
- 2) Application of SGD method for seed pathology can improve overall student’s achievement better. The distribution of student score is close to distribution of normal curve.

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