

The Development of Creative Learning Based on Student Centered Learning on Post Harvest Physiology and Technology

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Abstract: The new paradigm formed which was the teaching and learning process centered on lecturers (Teacher Centered Learning = TCL) is now a student-centered learning (Student Centered Learning = SCL), which is expected to encourage students to be actively involved in building knowledge, attitude and behavior. In the SCL process, students get the opportunity and facilities to build their own knowledge so that they will gain a deep understanding and ultimately improve their quality. The aim of SCL are: 1. Improve the quality of learning. 2. Creating a meaningful and interconnected picture of knowledge, increasing and stimulating student curiosity about knowledge. 3. Developing the potential of students potentially. Development of Creative Learning Based on SCL on Postharvest Physiology and Technology Courses by Learning methods can be interpreted as a method used to implement plans that have been prepared in the form of real and practical activities to achieve learning objectives. Several programs in SCL-based learning that have been implemented and used to implement learning strategies include: (A) Formation of Small Group Discussion, (B). Simulation, (C) Utilization of Information with Discovery Learning (DL). (D). Enabling Self Directed Learning (SDL) . (E). Enabling Cooperative Learning (CL). (F). Motivate for Collaborative Learning (CbL).

Keywords: Student Centered Learning, Postharvest Physiology and Technology Courses.

I. INTRODUCTION

Education is the most important factor in the effort to realize development in all fields. Without good education, there will not be a generation that will later bring the country to become more advanced. It is recognized that the current formal education system tends to put pressure on the mastery of science alone which ultimately damages other forms of learning.

Now is the time to think of a form of education as a whole that can lead to changes in educational policy in the future, in terms of content and methods. Global changes are developing so rapidly, such as the development of science, technology and information, arts and culture. These developments must be in line with the development of the world of education, namely an active and efficient learning process.

Previously in Indonesia the learning process was still TCL. Teaching and learning process carried out only one direction where the teacher is more active in teaching than student participants. Students only listen to the explanations that the

teacher conveys with lectures. This learning model is considered to be lack of exploring insight, student knowledge and lacking opportunities for students to express their opinions. It is from this problem that makes the new paradigm formed which was the teaching and learning process centered on lecturers is now a student-centered learning , which is expected to encourage students to be actively involved in building knowledge, attitude and behaviour. In the student-centered learning process, students get the opportunity and facilities to build their own knowledge so that they will gain a deep understanding and ultimately improve their quality.

Through the application of SCL students must participate actively, always challenged to have critical power, be able to analyze and be able to solve their own problems. The role of the lecturer in SCL is as a facilitator. The SCL method is now considered to be more in line with current conditions. Which emphasizes the interests, needs and abilities of individuals. This learning model can develop the quality of human resources needed by the community. As well as global insights to be able to always adapt to changes and developments of the times.

The aims of Student Centered Learning (SCL) are:

1. Improve the quality of learning.
2. Creating a meaningful and interconnected picture of knowledge, increasing and stimulating student curiosity about knowledge.
3. Developing the potential of students potentially.

Scope of Student Centered Learning (SCL)

The scope of SCL in Post Harvest Physiology and Technology Course is to invite students to understand deeply about plant physiology and physiology that occur during chemical and biochemical physical changes in fruits and vegetables and to apply post-harvest technology well to reduce the quantity and quality losses in handling post-harvest tropical fruits and vegetables.

II. DEVELOPMENT OF CREATIVE LEARNING BASED ON STUDENT CENTERED LEARNING ON POST-HARVEST PHYSIOLOGY AND TECHNOLOGY COURSES

Learning methods can be interpreted as a method used to implement plans that have been prepared in the form of real and practical activities to achieve learning objectives. Several programs in SCL-based learning that have been implemented and used to implement learning strategies include:

A. Formation of Small Group Discussion.

The formation of a Small Discussion Group with a group of 6 students was formed based on student interests. Then this group is tasked to discuss one of the topics in the Post-Harvest Physiology course syllabus. Lecturers assign to search material from other sources through Google or other library sources stored in the Library. Materials provided by group lecturers include harvesting, sorting, handling in the field, transportation, storage, types of storage technology for various commodity storage. Of the 162 students who took this course, it was divided into 26 small groups with material for each group as follows:

1. HARVESTING (Harvest Criteria, Harvest Signs and Harvesting Methods)
2. HOW TO STORAGE (Factors influencing the application of the modified atmosphere for various commodities., Effect of air composition and storability. Efforts to maintain the freshness of commodities after harvest; by Controlled Atmosphere Storage (CAS).
3. Modified Atmosphere Storage (MAS) and Low Pressure Storage (LPS) or Hypobaric Storage
4. Cooling; 5. HANDLING POST-HARVESTING SEEDS...
5. HANDLING POST-HARVEST OF VEGETABLES.
6. Handling of Post-Harvest Tomatoes (*Solanum Lycopersicum*)
7. Post Corn Harvest Handling (BabyCorn)
8. Handling of Post-Harvest of Capsicum (*Capsicum frutescens*)
9. Post-Harvest Management of Long Beans (*Vigna sinensis*) ...
10. Handling of Post Harvest Mustard (*Brassicajuncea*)
11. Post-Harvesting Lettuce Handling (*Lactucasativa. L*)
12. Post-Harvest Management of Cabbage (*Brassicaoleracea, LINN*)
13. Handling Post Cucumber Harvest (*Cucumissativus. L*).
14. Management of Post Harvest Spinach.
15. HANDLING POST-HARVEST FRUIT
16. Handling of Post Harvest Pineapple (*AnanasComosus 1.*)
17. Post-Harvest Handling of Rambutan Fruit (*Nepheillum lappaceum LINN*)

18. Management of Post-Harvest Mangosteen (*Garcinia mangostana. L*)
19. Post Harvest Management of Salak Fruit (*Salacca edulis*)
20. POST HARVEST HANDLING
21. Handling of Harvested Soybean with High Water Content
22. Handling of Harvested Soybean with Low Water Content
23. Handling and Storage of Soybean Seeds
24. Handling for Soybean Seed at Farmer Level
25. Storage of Soybean Seeds
26. How to Measure Postharvest Looses

Furthermore, this group makes presentations in their groups. Discussion is one of the elements of active learning and is part of many other SCL learning models, such as CL, CbL, PBL and others. In class, students create small groups (for example 6 people) to discuss material that can be provided by lecturers or materials that are obtained by members of the group themselves. This method is used by students when exploring ideas, summarizing important points, accessing students' level of skills and knowledge, reviewing topics in the previous class, comparing issues, theories and interpretations as well as solving problems. When this method is applied in class the students present the results of their small group work in turn so that the lecture material can be distributed to all small groups and presented in lecture rooms in a panel, so students learn to be good listeners, work together to give together, give and receive constructive feedback, supporting opinions with evidence and valuing varied points of view on topics shared by lecturers.

B. Simulation.

Simulation is a model that brings situations similar to the real thing in the classroom. For example simulation as a manager of a company engaged in marketing Cerealia (Grains) or leaders, students are asked to create a fictitious company, then play a role as a manager or leader in POST HARVEST HANDLING, starting from Harvest., Harvest Ripe Criteria. Harvesting Tools ... Drying, Threshing, Natural and. Artificial Drying. Storage Cleaning, Husking, Hulling. Grain Separation Frosting, Calculation of Milling Shrinkage, Packing and Warehousing, Storage and Marketing. This simulation can form role playing (Role Playing). The benefits of this simulation model can change the mindset of students by practicing general abilities, practicing special abilities and teams, developing problem solving abilities, and developing their abilities as entrepreneurs in agriculture.

C. Utilization of Information with Discovery Learning (DL).

Discovery Learning (DL) is a learning method that is focused on the utilization of available information both provided by lecturers and those sought by students. The aim is to build knowledge through independent learning. This method is done by giving assignments to students to obtain material about

EFFECT OF ETHYLENE HORMONE ON PHYSIOLOGICAL PROCESS Ethylene Hormone Ethylene properties3. Ethylene Synthesis .4. Effect of ethylene on tissue material The use of ethylene as a controller of fruit maturation 6. the use of ethylene as a green color removal agent (Degreening) .7. The Effect of Hormones Other Than Ethylene on the storage of tropical fruits and vegetables starting from the factors that influence the application of storage methods, the effect of air composition and storability as well as efforts to maintain the freshness of commodities after harvesting by looking for teaching materials from sources can be obtained through books Post Harvest, newspaper, Trubus magazine and internet.

D. Enabling Self Directed Learning (SDL).

Self Directed Learning (SDL) is a learning process carried out on the initiative of students themselves. Students, who plan, implement and self-assess their learning experience about CHEMICAL COMPOSITION FRUIT AND VEGETABLES starting from the Water, Carbohydrate, Cellulose, Hemicelluloses, Pectin, Lignin, Cell Wall, Primary Cell Wall, Secondary Cell Wall, Middle Lamella. , State of Cell Walls After Harvesting, Starch Substances, Changes in Carbohydrates in Fruits., Changes in Polysaccharide Content, Changes in Protein Content, Changes in Pigment Content, Changes in Phenol Derivatives, Changes in Organic Acids.

The ratio of Organic Acid and Sugar that has been lived, all done by the individual himself. The role of the lecturer here only acts as a facilitator who provides direction, guidance and confirmation of the learning progress that has been made by the individual. The benefit of this method is to realize and empower students, that learning is their responsibility. Students are encouraged to take responsibility for all thoughts and actions taken. To be able to apply this method, previously teachers must be able to meet the assumption that the ability of students should be shifted from people who are dependent on others to individuals who are able to learn independently.

E. Enabling Cooperative Learning (CL).

Cooperative Learning (CL) is a group learning method that is designed by lecturers to solve a problem or case or do an assignment on how to handle a FRUIT HARVEST

1. Postharvest Handling of Pineapple (*Ananas Comosus* Merr.), Harvesting, Sorting and Welding of Fruits. Fruit Packaging, Fruit Storage., Fruit Curing, Fruit Post Harvest Handling Rambutan (*Nephellium lappaceum* LINN)., Harvesting, Fruit Washing, Fruit Sorting, Fruit Storage. Fruit Welding, Fruit Packaging, Fruit Storage.
2. Post-Harvest Handling of Mangosteen (*Garcinia mangostana*. L)., Harvesting, Sorting, and Fruit Welding., Fruit Packaging., Fruit Storage,
3. Handling of Salacca Fruit (*Salacca edulis*). Harvesting, Fruit Cleaning, Fruit Sorting and Welding, Fruit Packing, Fruit Storage, which is

carried out by farmers and small traders as well as large traders.

This group consists of 10 students who have diverse academic abilities and carry out the assignment given earlier by searching material from library sources, the internet. This method is very structured, because the formation of groups, the fruit storage material in various types of market chains is different and what is discussed in the next step is the discussion in class and the final results are all determined and controlled by the lecturer. Students only follow discussion procedures designed by the lecturer. Cooperative Learning (CL) is useful to help foster and hone the active learning habits of students, a sense of individual and group responsibility, the ability and skills of cooperation between students and social skills of students.

F. Motivate for Collaborative Learning (CbL)

Collaborative Learning (CbL) is a learning method that emphasizes collaboration between students based on consensus that is built by the group members themselves. The task of the lecturer about 1. HANDLING POST-HARVEST VEGETABLES ... 2. Handling of Post Harvest Tomatoes (*Solanum Lycopersicum*)., Harvesting, Sorting, Welding and Washing., Packing / Packaging., Transportation, Storage 3., Post Corn Harvest Handling (BabyCorn)., Harvesting, Stripping, Sorting, and Welding., Packaging, Storage ... 4. Post-Harvest Handling of Red Chili (*Capsicum annum* var. Longum), Harvesting, Fruit Sorting and Welding, Packaging, Storage. 5. Post Harvest Handling of Hot Pepper (*Capsicum frutescens*)., Harvesting, Fruit Sorting and Welding, Packaging, Storage. 6. Post-harvest handling of long beans (*Vigna sinensis*)., Harvesting, sorting, welding and washing, binding and packaging, storage. 7. Handling of Post-Mustard Harvest (*Brassica juncea*), Harvesting, Sorting, Welding and Washing ..., Packaging, Storage., 8. Post-Lettuce Harvest Handling (*Lactucasativa*. L, Harvesting, Sorting, Welding and Washing, Packing, Storage, Post-Harvest Management of Cabbage Harvest (*Brassica oleracea*, LINN var. Capitata, LINN)., Harvesting, Sorting and Washing Fruit, Temporary Storage, Storage of Post-Harvesting Cabbage (*Brassicaoleracea*, LINN var. Capitata, LINN)., Harvesting, Sorting and Welding Fruit, Temporary Storage , Packing and Packaging 9. Post-Harvest Handling of Cucumbers (*Cucumissativus*. L). Harvesting, Sorting and welding Washing, Packaging, Storage. 10. Post Harvest Spinning Management ... Harvesting, Sorting, Washing Welding, Packaging Binding, Storage. The formation of groups is based on interests, group work procedures, determining the time and place of group discussions, to how the results of group discussions want to be assessed by the lecturer, all determined by mutual consensus among group members

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