

# **PROCEEDING**

## **THE 2015 INTERNATIONAL SEMINAR ON EDUCATION**

**Theme:**

**“The Uniqueness of Educational Practices  
towards Harmonization of the ASEAN  
Community in 2015”**

**ISBN: 978-602-8043-43-4**

**Organized by**

**Faculty of Teacher Training and Education University of  
Bengkulu, Indonesia, joint with Communication Forum  
State Faculty of Teacher Training and Education  
Indonesia, and School of Education in ASEAN Countries**

**Grage Horizon Hotel, Bengkulu, Indonesia  
16-18 January 2015**



# PROCEEDING

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**ISBN 978-602-8043-43-4**

LEARNING QUALITY IMPROVEMENT OF ORGANIC CHEMISTRY I BY USING COOPERATIVE LEARNING MODEL, JIGSAW AND HYPERMEDIA DEVELOPMENT BASED ON MICROSOFT POWERPOINT APPLICATION. Dewi Handayani and Agus Sundaryono .....	377
DEVELOPING STUDENTS' MATHEMATICAL REASONING THROUGH REALISTIC MATHEMATICS LEARNING BASED ON OPEN-ENDED PROBLEM. Saleh Haji .....	384
IMPROVING STUDENTS' UNDERSTANDING IN CONCEPTS PHYSICS AND PROBLEM SOLVING SKILLS OF STUDENTS OF PHYSICS EDUCATION STUDENT AT BENGKULU UNIVERSITY, Eko Swistoro Warimun .....	392
APPLICATION OF CONNECTING, ORGANIZING, REFLECTING, AND EXTENDING (CORE) LEARNING TO IMPROVE CRITICAL THINKING SKILLS IN MATHEMATICS, Yumiati, Yaya S. Kusumah, Didi Suryadi and Jarnawi Afgani Dahlan .....	399
IMPROVING HIGH SCHOOL PHYSICS INSTRUCTION THROUGH LESSON STUDY MODEL IN ACEH PROVINCE, Djufri and Melvina .....	407
WITH RME KOMBINATORIK LEARNING IN SECONDARY SCHOOL BECOMES INTERESTING, Ervin Azhar, Ishaq Nuriadin and Nurafni .....	412
WAKING UP STUDENTS' LEARNING ENERGY USING INTERACTIVE MEDIA IN TEACHING SCIENCE THEMATICALLY, INTEGRATIVELY, AND CONTEXTUALLY, Nandang Hidayat and Teti Rostikawati .....	417
IMPROVING STUDENTS' LEARNING INDEPENDENCY IN ANIMAL STRUCTURE LECTURE USING COLABORATIVE APPROACH WITH LESSON STUDY BASED, R. Teti Rostikawati and Rita Istiana .....	423
POTENTIAL OF EXTRACT YOUNG LEAF SUNGKAI AS AN ANTI PLASMODIUM, Agus MH Putranto, Ariefa Primair Yani and Rahmad Darmawan .....	429
DEVELOPMENT OF INTERACTIVE ICT BASED LEARNING MATERIALS USE SLIDESHOW POWERPOINT BY USING AUDIO EFFECT FOR MATHEMATIC TEACHERS OF JUNIOR SCHOOL AT RURAL AREA KUBU WEST BORNEO, Bambang Hudiono .....	436
THE EFFECT OF THE CONSUMPTION OF PURE RAW PETE EXTRACT (PARKIA SPECIOSA) TOWARD DIABETES MELLITUS TYPE 2 ON THE WHITE RAT (RATTUS NORVEGICUS), Budhi H. Akbar and Mayarni .....	443
TEACHING MODEL MANAGEMENT: MAKE A MATCH LEARNING MODEL AND STUDENT ACHIEVEMENT IN SCIENCE IN ONE ELEMENTARY SCHOOL, MERSAM, BATANGHARI, JAMBI, Bestari .....	450
TEACHING MEDIA MANAGEMENT: IMPROVING STUDENTS' ACHIEVEMENT IN LEARNING CIRCLES IN MATH THROUGH PICTURES IN ONE ELEMENTARY SCHOOL IN MERSAM, JAMBI, Heriyanto .....	455

# LEARNING QUALITY IMPROVEMENT OF ORGANIC CHEMISTRY I BY USING COOPERATIVE LEARNING MODEL, JIGSAW AND HYPERMEDIA DEVELOPMENT BASED ON MICROSOFT POWERPOINT APPLICATION

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## ABSTRACT

The objective of this research is to apply the cooperative learning model, Jigsaw and hypermedia development by using power point as well to know the influence of the using media developed toward the students activity and learning result. The method used to achieve this goal is a method of classroom action research, learning process will be conducted by using cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application. Classroom Action Research used in this study consists of four components, namely: a. planning, b. acting, c. observing, and reflecting are described as follows. Learning process is held by using cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application can increase the learning achievement in each cycle I, II, III. the result more than standardize indicator 85 %. Percentage learning completeness classically cycle I to cycle III is 69 %, 93 % and 95 % with classical applicability in each cycle I, II, III is 75 %, 85 % and 91 %. Test point average in each cycle is over than passing standard 70. A result each cycle from cycle I to cycle III is 75,14; 85,11; 91,43. Cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application can increase students activity in learning process of Organic Chemistry I especially alkane, alkene, alkyne, sycloalkane, alcohol, eter, phenol, aldehyd, cheton, carboxylic acid topic.

**Keywords:** Organic chemistry I, jigsaw, hypermedia.

## 1. INTRODUCTION

Organic chemistry 1 is a compulsory lesson given in third semester. Organic chemistry 1, a compulsory lesson in Chemistry education is given after the student obtain to explain about Introduction of organic chemistry/carbon chemistry, molecular structure, chemical bond, orbital molecular theory on organic compound, resonance theory, organic compound classification, molecular formula, structural formula and isomers, nomenclature of organic compound, hydrocarbon, stereochemistry and functional group (Fessenden & Fessenden, 1995). According to student opinions, Organic Chemistry I course is no difficult, but after the learning process done, some of students give their complaint, feel nervous and surprise, in fact the organic chemistry I needs the students to hard effort to think abstractly (according to the students opinion as audience result), while as when they learned in Senior High School, the ways they use mostly memorizing (it means the basic concept has been made). The students disable to correlate or build up the first concept (organic chemistry in Senior High School) they got to develop their new knowledge become one of the causing trouble their learning result in this subject is lower than others in the same semester. This cause the students mostly are not ready yet to learn in each meeting and this can influence the process of learning activity. If this condition has not been solving yet, it can influence their IPK (cumulative result) because this subject has significant rule and has semester credit for 4 SKS (3-1). Student learning achievement in this lesson is low because there are a less

media and teaching material or hand out. student has low activity. lecture often use monotonous method. (Like speech method that caused bi-directional interaction between student and lecture be stagnanced). To increase the quality of learning process in this lesson it seems important to take improvement in its using approach, method, media and evaluation that has been done (Suryono, 2004).

The learning achievement of organic chemistry I supported by many factors such as lecture, student, learning media, and the facilities in the college, therefore it needs the lecture's innovation to improve the student achievement and activity in the class. One of the ways is by correlate between the learning model and media. The learning model often used to improve the learning quality is cooperative learning model, jigsaw with teaching material and hypermedia.

To get an optimal result in learning process, lecture must be creative in using media lesson, method and evaluation. In lesson, using by cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application. Application cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint programme are important to be done in order to know does the application programme can increase student activity and study result of learning process of organic chemistry I in chemistry education program FKIP University of Bengkulu.

According to Slavin (1990) cooperative learning can help student in define organization and motivation structure to build collaborative partner, cooperative and collaborative learning mean that students learn in a group. Cooperative and collaborative learning based on constructivism use student subsume as a way to motivate idea interchange argumentation and reflection from each group member to construct knowledge. In realization they are done by some types of jigsaw.

Jigsaw is the teaching technique, where the students in learning process are supposed to cooperate each other and have the same chance to manage the information and improve the communication skill. (Aeroson, E in Anita Lie, 2002). Learning cooperative model, Jigsaw will use in this research because this learning model can make students be responsible toward the material given in their group.

Jigsaw consistef students read and analyze the material, homogenous discussion club, heterogevious discussion club test/quiz and lecture reinforcing. Jigsaw required there must be written material that can be learned by students. In jigsaw individual ability of students is quiet important to be peer tutor their groups.

Dryden (1994) argues that hypermedia environments can indeed promote the appreciation of literature (and of texts in other disciplines) as they nurture the growth of the learner in intellect and spirit. These are two quotations from a large and expanding literature on hypermedia. Technology is unquestioningly advocated as an advance in educational technology for one or more of the following reasons: (a) Hypermedia enables nonlinear access to vast amounts of information (Nielsen, 1995); (b) users can explore information in depth on demand (Collier, 1987); (c) interaction with the instructional material can be self-paced (Barrett, 1988); (d) hypermedia is attention capturing or engaging to use (Jonassen, 1989); and (e) hypermedia represents a natural form of representation with respect to the workings of the human mind (Delany & Gilbert, 1991).

In communication learning form really needs the media rule to increase the effectiveness level of goal achievement / competence. In the learning system, there are the correlation component to reach the goal such as: goal, material, method, media and evaluation. Hypermedia is developed based on Microsoft power point program. Therefore the researcher is interested to carefully examine how is the students activity and achievement by using cooperative learning model, jigsaw with the hypermedia development by using Microsoft power point program.

The use of learning media as the message source is believed by the researcher can support the students learn actively, because this way not only easy to understand in directly learning context to students but also effective for the lecture to inform the relevant material to the subject competence target. The using of learning media suppose to create interesting learning process in the class, so the students are more motivated in learning and finally they can reach optimal

achievement. The using of cooperative learning model, Jigsaw in this research is stressed on the variation of hypermedia base on power point program. According to the researcher, one of the important things in using this learning media because the topics in the organic chemistry I subject mostly abstract and cause some students feel difficult to understand. The material made will be edited by learning media expert.

The objective of this research is to apply the cooperative learning model, Jigsaw and hypermedia development by using power point as well to know the influence of the using media developed toward the students activity and learning result.

## 2. METHODOLOGY

This research is a classroom action research. In This research, learning process will be conducted by using cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application. The subjects of this reserach are students who took organic chemistry 1 (the 3<sup>rd</sup> semester) in 2013/1014 in the Study Program of Chemistry Education JPMIPA FKIP UNIB by face to face in class and laboratory work. Course totally is 40 students. Data collection technique is done by interview through discussion between supporter lecture of organic chemistry 1 to investigate the problem that cause the students. Learning achievement in this lesson is still low. The observation paper is used to monitor students activity in construct, analyze and solve the problem as long as learning process going on. Observation sheet for lecturers are used during the implementation of teaching and learning activities. This sheet aims to identify the deficiencies conducted by lecturees at the time of learning activities. The results of these observations will be used as guidelines for improving teaching and learning activities in the next cycle. Observation sheet for students are used to determine the activity of students during the learning process takes place. Deficiencies and weaknesses in teaching and learning will be improved for the next cycle. Test/quiz to know the best result reached by students. Test is a series of questions or exercises or other device used to measure the skills, knowledges, intelligences, abilities or talents possessed by individuals or groups (Arikunto, 2002). The research was implemented into three learning cycles, where each cycle consists of four stages, namely planning, action, observation, and reflection.

Cycle I – cycle III :

### 1. Planning

Activities done in the planning stages are:

- a. Develop learning syllabus
- b. Make lesson plan (RPP)
- c. Creat a learning scenario
- d. Prepare observation sheet for students and lecturers
- e. Prepare Cooperative learning types of Jigsaw and hypermedia with microsoft powerpoint programme. Teaching materials for cycle 1 is introduction of organic chemistry and hydrocarbon, cycle 2 is alkana, alkena and alkuna, and cycle 3 is functional group.
- f. Creat a cycle of evaluation of cycel I (post test)

### 2. Action

Implementing learning Organic Chemistry I courses that apply cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application with the following steps:

- a. Lecturer delivers basic competencies and learning outcomes indicators.
- b. Lecturer presents material.
- c. Lecturer gives students a question and answer opportunity.
- d. Students are divided into groups of the heterogeneous groups of 4-5 students.

- e. Lecturer gives hypermedia on microsoft powerpoint application for student
  - f. Lecturer explains the general discussion that will be done.
  - g. Class divided into groups of experts
  - h. Each group will read one text and take notes
  - i. New groups will be formed.
  - j. Each new group will have one expert from the former group
  - k. Each expert will tell his/her peers about his topic. Group members take notes.
  - l. Posttest
3. Observation
- a. Observation activities performed by lecturers by completing the observation sheet that has been provided
  - b. Observed Students in upper division courses.
4. Reflection
- At this stage, analysis of learning process has been done. Based on the analysis it is obtained weaknes factors and problems that arise from this cycle to be improved in the second cycle. Planning of next action.
- At the end of each the cycle students will be given a test. While test data by using cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application student abilities are analyzed quantitatively.

### 3. RESULTS AND DISCUSSION

Classroom action research was conducted in three cycles in Organic chemistry I courses 3-1 credits in the Study Program of Chemistry Education. In accordance with the objectives and results of the study, it is discussed in this section are : ( 1 ) the activity of lecturer and students in the first cycle, the second cycle and the third cycle (2) either the student learning outcomes in the first cycle, the second cycle and the third cycle.

Discussion about the activities of lecturer and students based on the results of research that has been conducted on organic chemistry I learning by using cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application in the first cycle, the second cycle and the third cycle. Students learning motivation is increased by using this learning model, so that bi-directional learning process is showed. It can be seen from good learning achievement that get in observing power or learning completeness. Less maximal of students learning achievement can be influenced by using cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application. Lecture and student activities get showed in the Table 1.

Table. 1 Lecture and student activity comparism in cycle I, II, and III

Cycle	Lecturer Activities	Student Activities
I	Good	Enough
II	Good	Good
III	Good	Good

Application cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application in individually learning can increase lecturer and students activity in learning process, if comparison to construct their previously knowledge in learning process of organic chemistry I.

Learning process material is an interesting material to learn because this material is using cooperative learning model, figure and hypermedia development based on microsoft powerpoint direct advantage cycle of learning with students directly to obtain information. Students can get very important to help students understand about discussion material. Hypermedia product can help figure in learning process, so the material can be explain with systematic and can interest learning for student.

Discussion on student learning outcomes of cognitive is also based on the research that has been conducted on Organic chemistry. Learning by using cooperative learning model, figure and cycle and the third cycle. Learning process is held by using cooperative learning model, figure and table 2.

Table 2. Learning achievement comparison in cycle I, II, and III

No	Class Condition	Result In The Cycle			Note
		I	II	III	
1	Number of all students	42	42	42	
2	Number of students that follow the test	42	42	42	
3	Number of students who get point > 70	29	39	40	Passing point indicator 70
4	Number of students who get point < 70	13	3	2	
5	Average point	75,14	85,11	91,43	
6	Classical applicability	79%	83%	91%	
7	Learning completeness Classically	69	93%	95%	Learning completeness indicator 85 %

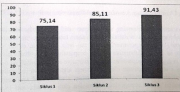
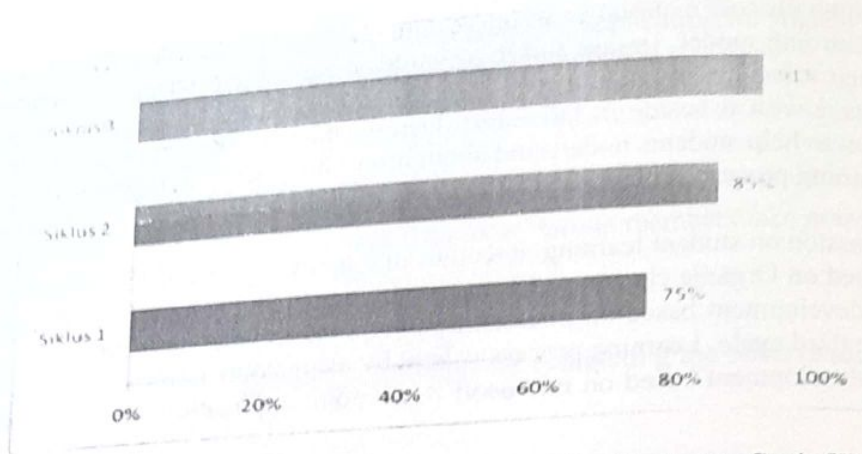
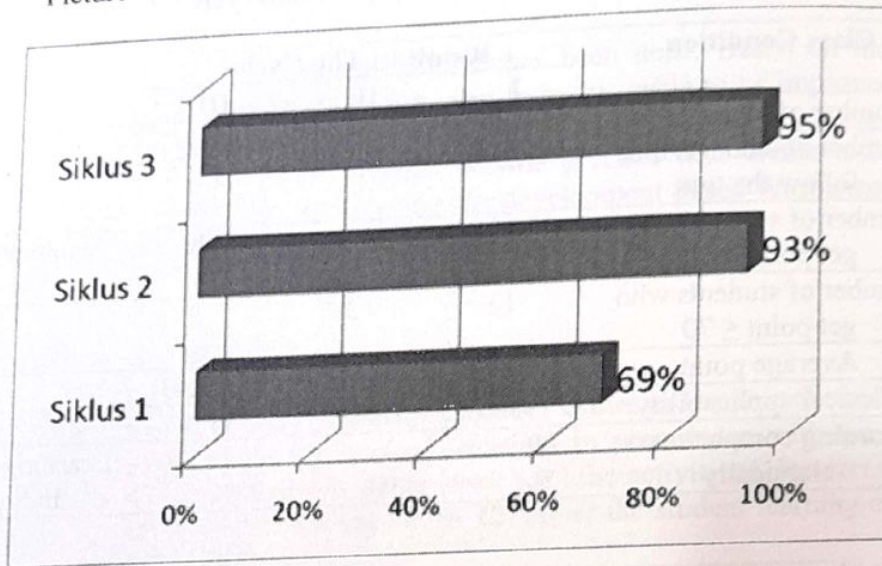


Figure 1. Chart Student Learning Outcomes Cognitive of Average Cycle I to Cycle III





Picture 2 Chart Percentage Classical applicability Cycle I to Cycle III



Picture 3. Chart Percentage Learning completeness classically cycle I to Cycle III

Application cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application in individually learning can increase the learning achievement. According to Slavin (1990) cooperative learning can help student in define organization and motivation structure to build collaborative partner, cooperative and collaborative learning mean that students learn in a group. Cooperative and collaborative learning based on constructivism use student subsume as a way to motivate idea interchange argumentation and reflection from each group member to construct knowledge. Jigsaw consistef students read and analyze the material, homogenous discussion club, heterogevious discussion club test/quiz and lecture reinforcing. Jigsaw required there must be written material that can be learned by students. In jigsaw individual ability of students is quiet important to be peer tutor their groups friends.

#### 4. CONCLUSION

Learning process is held by using cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application can increase the learning achievement in each cycle I, II, III. the result more than standardize indicator 85 %. Percentage learning completeness classically cycle I to cycle III is 69 %, 93 % and 95 % with clascal applicability in each cycle I, II, III is 75 %, 85 % and 91 %. Test point average in each cycle is over than passing

standard 70. A result each cycle from cycle I to cycle III is 75,14; 85,11; 91,43. Cooperative learning model, jigsaw and hypermedia development based on microsoft powerpoint application can increase students activity in learning process of Organic Chemistry I especially alkane, alkene, alkyne, cycloalkane, alcohol, eter, phenol, aldehyd, cheton, carboxylic acid topic. Jigsaw and hypermedia development in chemistry learning process is much better if we use Jigsaw type and it can be done if written material is ready beside it, students must be tried to understand the simple concepts, then to understand a sense in a paragraph, after that to understand sub topic and eventually jigsaw application learning process or can be used modify jigsaw that jigsaw interspaced by material deadline from lecture.

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