

# **The Influence of Compact Disk Interactive Learning Model And Student's Creativity Toward The Understanding of Mathematics Concept**

**(Experimental Research to The Class of Multimedia, University of Serang Raya)**

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**Abstract**—The main purpose of this research is to know the influence and interaction between Compact disk Interactive learning model and university student creativity toward the understanding of mathematics concept. Collecting of the data is conducted by using test technique, questioner technique, and document technique (Compact disk Interactive learning model). Data collected is analyzed by using ANAVA two sides and it is continued with the *tukey* test. Result of the research shows that: (1) Compact disk Interactive learning model gives influence to the understanding of mathematics concept, (2) university student creativity gives influence to the understanding of mathematics concept, (3) there is interaction between Compact disk Interactive learning model and university student creativity toward the understanding of mathematics concept, (4) there is influence of the understanding of mathematics concept with Compact disk Interactive learning concept for the university student's creativity.

**Keywords**—compact disk interactive learning model; high creativity; low creativity; understanding of mathematics concept

## I. INTRODUCTION

Generally, our learners have difficulties in differentiating, utilizing, and choosing the procedure or operating something. It is caused by understanding their math concept is still low. Whereas, understanding is the important thing when someone learns the material. It is supported by the statement of (Ruseffendi, 2001:260), he stated, "Math grows by minds that relate to the idea, process, and reasoning." One of the causes above is there is not applied learning model that demanded the learners to be active in their learning such as the learner asked to "sit-quiet-listen". The learner is just demanded to memorize what their teacher said without giving them chance for asking and arguing. So that, the learners' math understanding become low. So, creating the opinion that Math is not interesting and fun subject. That opinion surely will influence on university students' interest in learning Math that implicate to university students' achievement include on university students' ability in Math understanding.

University students' low interest on the concept of Math impacts on understanding of the Math concept that is not satisfied yet. It happened in The class of multimedia, university of Serang raya, based on the result of the interview to Math teacher and the result of observation got the data that for material of "Linear algebra" at Fourth semester got the lowest is 54.21 below SKBM (Syarat Ketuntasan Pemahaman konsep matematika) with the minimum score is 65, the average score that was got to material of that "linear algebra" is low than the other materials. It showed that university students didn't understanding yet about the concept of "linear algebra" that had been taught by the teacher.

In general, the process of learning Maath in The class of multimedia, university of Serang raya is still using memorizing the formulas so that learning is not worthy to

the university students, where as it's known that in the concept of material "linear algebra", there are many important terms that must be read carefully and understood by the university students such as the concept of nature of "linear algebra" and applying in daily life.

To solve the problem above needed changing the appropriate model and technique of learning that can motivate the university students to participate actively. So, the university students are not bored when learning process done. One of the alternative model of learning as the effort of improving university students' understanding of the Math concept is *Compact disk Interactive learning*, by giving the question through ball and role-play.

*Compact disk Interactive Learning* is learning model by giving the question through throwing ball question that is possible learning process becomes fun, fire, and involve the university students to be active. The university students will not be bored when they learn because the atmosphere of the learning process is fun learning (not only education but also game). The teacher hopes that they will be easily in understanding the material. It proved that there are many university students became active in learning process.

The university students who are active in asking the question will be improved through ball question. In this technique, the university students will get two advantages they are having fun of playing ball question and improving their ability in asking the question. By getting it becomes the habit for asking the question, hoped it can improve university students' Math understanding.

While, to avoid the individualistic that usually happened in learning process so in this research will use role-play technique, it is studying in group. In this case, the university students are demanded to cooperate in learning process. Besides that, the university students also have chance, motivation, and support for speaking, writing, reading, and listening in the classroom so that learning Math has multi advantages, they are they communicate to study Math and they learn to communicate mathematically because sometimes Math given in symbol communication, written communication, and oral creativity that contain about Math argument that is not always known as the important part in Math education.

So, by using *Compact disk Interactive learning* model that emphasize *fun learning* hoped can get creativity effectively so that it can improve the university students' understanding in Math concept. Based on the explanation above, the researcher concluded that to conduct the research about "The Effect of *Compact disk Interactive Learning* Model and University students' Creativity on Understanding of University students Concept"

## II. LITERARY REVIEW

The ability of university student's comprehension is different. It depends on the potential of each university student. So a teacher needs to know his or her university student in order to know how far the university student's ability to face the learning situation so that it can guide

the university student appropriately to improve the comprehension of mathematics concept Dalyono (2005:172). After knowing the definition of comprehension, so it will be explained the definition about concept. According to Ruseffendi (2006: 165), "concept is abstract idea that enables us to make group of things (objects) into example and non-example". While according to Rosser (Dahar, 1988:80) explained that concept is an abstract that represent a class of objects, events, activities or relations that have the same attribute. Based on the above opinions, it could be concluded that concept is abstract idea that make background a thing or an object. according to Gagne (Suherman, dkk, 2003: 3), in learning mathematics, there are two objects that will be obtained by the university students; direct object and indirect object such as the observation ability and problem solving, independent learning, positive thinking towards mathematics and know how to study. While the Wirect object, such as fact, skill, concept, and rule.

In learning mathematics at camps, the information about concepts that have to taught to the university student could be given from a number of sources includes the text books that are at school, the curriculum developments, knowledge and teacher experience, and interaction among the university students. by knowing the definition of comprehension and concept, so it will be explained the meaning of concept comprehension. According to explained that "the concept comprehension is the competence that showed by the university student in comprehending the concept and in doing the procedure (algorithm) smoothly, accurate, efficient and appropriate.

In practice in the field, the learning process is supported by a variety of learning models. The learning model is part of the instructional strategies. The learning model serves as a way to present, decipher, gives examples, and provide training to students to achieve certain goals (Yamin, 2010: 145). In addition to learning models, other support tools in the learning process, namely the media. Instructional media is anything that can deliver the message, to stimulate thoughts, feelings, and the willingness of the students so as to encourage the creation of learning process in self-learners. In line with the development of science and technology (Science and Technology), particularly in the fields of education, current use of tools or instructional media are becoming increasingly widespread and interactive, such as computers and the Internet. Interactive CD is a medium that confirms a multimedia format can be packaged in a CD (Compact Disk) with the goal of interactive applications in it. CD ROM (Read Only Memory) is only one of several possibilities that could unify voice, video, text, and programs on the CD.

Instructional media are now more varied, ranging from conventional media such as books and traditional props up with modern audio-visual media in the form of cassette tape, VCD (Video Compact Disk), as well as other modern learning tool. With a variety of media, it is

a learning system that can bring the fun atmosphere is absolutely necessary. Therefore, Interactive CD can be used as an alternative media that can address those needs. Interactive CD of some advantages, it can be seen that the Interactive CD can help sharpen the message delivered by the senses and pull the excess interest, because it is a combination of sight, sound, and movement (Suyanto, 2003: 18).

The using utilization of instructional media models in teaching and learning process hope will expand its class obtaining good learning outcomes and develop creativity. Creativity is the ability to reflect fluency, flexibility, and originality in thinking and the ability to elaborate an idea. Creativity is characterized by divergent thinking ability, ie the ability of individuals to seek a variety of alternative answers to a problem that reflects the fluency, flexibility, and originality in thinking and the ability to elaborate ideas (Mohammad, 2009: 44).

From the explanation of creativity, it can be argued that creativity is one's ability to give birth to something new, whether it be an idea / ideas and a real masterpiece, both in work and in combination with the new things that already exist, all of which are relatively different from what who have been there before.

### III. RESEARCH METODOLOGY

Population target in this research is all university students of fourth semester on the class of multimedia, university of Serang Raya. The first step in determining the sample is done based on random sampling, which all populations has the same chance to represent the population. Based on the number of classes, the sample class that is determined is IV A of multimedia class as experiment class and IV B of multimedia class as control class. The second step is pufosif sampling, it is done the creativity ability to determine the difference of high creativity ability and low creativity ability, both of in experiment and control class. The place of the research is conducted in the class of multimedia, university of Serang Raya. The time of the research is conducted on second semester 2014/2015 that started on February until March 2014 on Linear algebra subject.

The data that is needed in this research is the comprehension mathematics concept after getting the treatment and questionnaire to measure the ability of communication. The instrument to measure the university student's comprehension in mathematics concept is multiple choice tests. This research uses statistics test to test the mean similarity from two samples group; it uses ANOVA two ways. But it is needed to test the normality and homogeneity variants first.

This research uses factorial design 2x2 as on the table 1.

Table 1: Research design

	Learning	A <sub>1</sub>	A <sub>2</sub>
media creativity			
B <sub>1</sub>		A <sub>1</sub> B <sub>1</sub>	A <sub>2</sub> B <sub>1</sub>
B <sub>2</sub>		A <sub>1</sub> B <sub>2</sub>	A <sub>2</sub> B <sub>2</sub>

Notes:

- A<sub>1</sub> : Learning by using *Compact disk Interactive Learning*
- B<sub>1</sub> : high creativity ability
- A<sub>2</sub> : learning by using *speech*
- B<sub>2</sub> : low creativity ability
- A<sub>1</sub>B<sub>1</sub> : the score of mathematics concept comprehension with high creativity ability in *Compact disk Interactive Learning*
- A<sub>2</sub>B<sub>1</sub> : the score of mathematics concept comprehension with high creativity ability in *Speech*
- A<sub>1</sub>B<sub>2</sub> : the score of mathematics concept comprehension with high creativity ability in *Compact disk Interactive Learning*
- A<sub>2</sub>B<sub>2</sub> : the score of mathematics concept comprehension with LOW creativity ability in *speech*.

IV. RESULT AND DISCUSSION

After experimental class and control class were given a treatment, so the researcher conducted evaluation through the test that had been valid as many as 25 questions of multiple choice of "linear algebra" material. In the research data description will be explained about the result of the research data such as highest score, lowest score, average score, modus, median, standard deviation, variety and table of frequency distribution and histogram for each group of the data. To make it clear the data above made the resume of the research data description, as follow:

Table 2: Overall Statistics

		A <sub>1</sub> B <sub>1</sub>	A <sub>1</sub> B <sub>2</sub>	A <sub>2</sub> B <sub>1</sub>	A <sub>2</sub> B <sub>2</sub>
N	Valid	16	16	16	16
	Missing	0	0	0	0
Mean		83.4375	70.9375	70.3125	80.6250
Std. Error of Mean		2.31475	1.38585	1.79518	2.61705
Median		80.0000	70.0000	72.5000	75.0000
Mode		80.00	70.00	75.00	70.00

Std. Deviation	9.25900	5.54339	7.18070	10.46821
Variance	85.7293	30.7293	51.5623	109.583
Skewness	.740	-.418	-.432	.409
Std. Error of Skewness	.564	.564	.564	.564
Kurtosis	-.524	.822	-1.215	-1.660
Std. Error of Kurtosis	1.091	1.091	1.091	1.091
Range	30.00	20.00	20.00	25.00
Minimum	70.00	60.00	60.00	70.00
Maximum	100.00	80.00	80.00	95.00
Sum	1335.00	1135.00	1125.00	1290.00
Percentiles	25	70.0000	70.0000	70.0000
		0	0	0
	50	70.0000	70.0000	75.0000
		0	0	0
	75	75.0000	75.0000	93.7500
		0	0	0

A. Hypothesis Test

Data hypothesis got was processes by using SPSS 16 program, as follow:

Table 3 Tests of Between-Subjects Effects

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	2598.984 <sup>a</sup>	3	866.328	11.939	.000
Intercept	375339.602	1	375339.602	5172.639	.000
Kom	1115.336	1	1115.336	11.589	.010
AL	2420.816	1	2420.816	33.362	.000
Kom * AL	45.473	1	45.473	4.627	.032
Error	4353.750	60	72.563		
Total	382875.000	64			
Corrected Total	6952.734	63			

a. R Squared = ,374 (Adjusted R Squared = ,342)

a. **The differences effect of understanding university students' math concept that made Compact disk Interactive Learning and lecturing.**

Based on the statistic above, to know the significant differences of getting test in understanding math concept in experimental class and control class it earlier needed standard hypothesis that will be used as the criteria of taking decision, as follow:

1. Hypothesis:

$$H_0 : \mu A_1 > \mu A_2$$

$$H_1 : \mu A_1 \leq \mu A_2$$

2. Taking Decision

Basic of taking decision is by using determination if the score of sig-count > 0.05, H0 is accepted. On the contrary, if the score of sig-count < 0.05, H0 is denied because in the AL column the score of sig-count 0.000 < 0.05 so H0 is denied.

Based on the statistical analysis above, it can be concluded that learning by using Compact disk Interactive Learning model gave higher contribution in improving university students' understanding math concept than by using lecturing.

a. **The differences effect of understanding university students' math concept of university students' who have high creativity and low communication**

Based on the statistic above, to know the significant differences of getting test in understanding math concept in experimental class and control class it earlier needed determined the hypothesis that will be used as the criteria of taking decision, as follow:

1. Hypothesis

$$H_0 : \mu B_1 > \mu B_2$$

$$H_1 : \mu B_1 \leq \mu B_2$$

2. Taking Decision

Basic of taking decision is by using determination if the score of sig-count > 0.05, H0 is accepted. On the contrary, if the score of sig-count < 0.05, H0 is denied because in the Kom (Communication) column the score of sig-count 0.000 < 0.05 so H0 is denied. So that, understanding of math concept on the university students who have high creativity is higher than the university students who have low communication.

b. **The interactive effect of learning by using Compact disk Interactive Learning and creativity on university students' understanding of math concept**

To know the significant interactive effect of Compact disk Interactive Learning and creativity on understanding math concept so it earlier needed determined the hypothesis that will be used as the criteria of taking decision, as follow:

1. Hypothesis

$$H_0 : \text{Interaction A X B} = 0$$

$$H_1 : \text{Interaction A X B} \neq 0$$

2. Taking Decision

Basic of taking decision is by using determination if the score of sig-count > 0.05, H0 is accepted. On the contrary, if the score of sig-count < 0.05, H0 is denied because in the Kom (Communication) \*AL the score of sig-count 0.032 < 0.05 so H0 is denied. So there are interactive effects of learning by using Compact disk Interactive Learning and creativity on university students' understanding of math concept.

d. **Discussion of Research Result**

Through referring on the data of university student's result can be arranged some interpretation difference in understanding math concept of each learning group based on applying learning media and creativity on the learners as follow:

a) **There is the difference effect in understanding math concept that were given learning by using Compact disk Interactive Learning and lecturing**

Based on the research result, it can be said that using Compact disk Interactive Learning can give the influence directly on understanding math concept "linear algebra". The result showed that understanding math concept that followed learning by using Compact disk Interactive Learning model got the average score 77.18750, while group of university student that followed learning by using lecturing that got the average score is 75.46875.

Actually, the average score of understanding math concept that used Compact disk Interactive Learning model higher than the university students that used lecturing. Higher score of university students of understanding math concept that used Compact disk Interactive Learning is based on the activation of university students in learning process. The university students used their skill that they have learnt. The university students' response on the using of Compact disk Interactive Learning model is more positive than using lecturing model.

b) **There are the differences effect of understanding university students' math concept that have high creativity and low communication**

The comparison of understanding math concept about "linear algebra" between the university students who

have high creativity and low communication, the university students who have high creativity have the average score, it is 77.18750 while the university students who have low creativity have the average score, it is 75.46875. The university students who have high creativity studied effectively because in this material the university students need creativity to answer the questions and exercise. In fact, the university students who have high creativity worked faster in finishing the math question caused by faster in finishing the questions by using Compact disk Interactive Learning model, then they were able to have quick count and related between one to the other concepts so that the teacher seldom asked to them.

**c) There are interactive effects of learning by using Compact disk Interactive Learning model and creativity on understanding university students' math concept**

The result of the research got that there are interactive effects of Compact disk Interactive Learning media and creativity on understanding university students' math concept. In could be seen on descriptive statistic by using SPSS that was got from ANOVA test 2 x 2 (Table 4.14). In the group who have low creativity by using Compact disk Interactive Learning and in the group who have low creativity without using Compact disk Interactive Learning, have the difference average score of understanding math concept with the group who have high creativity in Compact disk Interactive Learning model with the group that using lecturing model. The university students who have high creativity will easily learn the math materials by using Compact disk Interactive Learning so that will increase understanding university students' math concept and both of them have interaction each other. So, there are interactive effects of Compact disk Interactive Learning model and creativity on understanding university students' math concept.

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