

The Influence of Design Creativity Experiment on Learning Outcomes: A Survey in Vocational High Schools in Jakarta

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Key words: Learning outcomes, creativity experiment.

Abstract: This study was aimed to determine the influence of design creativity experiment on students' learning outcomes in Decoration Design subject. The dependent variable in this study is the learning outcomes, and the independent variable is the design creativity experiment. This quantitative study was carried out by conducting design creativity experiment on the population of Fashion and Design Vocational High Schools in Jakarta. The sample of this study comprised of 172 students of XII grade who enrolled in the Decoration Design subject. During process, design experiment prioritizes the basic understanding of design, skill, innovation and creativity of the decoration design making idea. The beauty in the process of making ornamental fabrics lies on the employment of a variety of basic embroidery techniques and the material of media used. The basic understanding of design and the accuracy of the decorating techniques collaboration, the selection of size and color of the decoration as well as the base material as a decorative medium, will enhance the beauty and selling power of the product. The result of this study suggested that there was a significant influence of design creativity experiment on students' learning outcomes for making decorative design. in class XII of Fashion and Design Vocational High Schools in Jakarta.

1 INTRODUCTION

Vocational High School (or *Sekolah Menengah Kejuruan - SMK*) currently implements Decoration Design subject into the learning curriculum, which trains and educates students to be creative in creating decoration on the parts of clothing to make it look more beautiful so that it can enhance not only the aesthetic value but also the selling power. One of the productive subjects in fashion design major of Vocational High Schools is decoration making, teaching various techniques to make ornaments on the clothing. Various kinds of basic skewers and the provision of pattern with the dye is what will be developed and creatively turned by students into a variety of decorative clothing that is applied with various clothing materials.

Starting from the types of white embroidery, colored embroidery, to the use of screen printing techniques or painting on the cloth, in which even with a high level of creativity, humans can change the function of the axis of the stove into an ornament in clothing. During the learning process, Vocational High School students are taught with more varied media including the use of electronic

devices connected to the internet. It is intended as an additional material of knowledge so that students can be more creative in modifying or designing decoration on the fabric. The use of various supporting facilities and infrastructure in learning activity is intended to increase the knowledge or insight of students in decorating and beautify the look of a clothing.

Various techniques in decorating fabric can also be applied not only to a design of a fabric but also to parts of clothing such as hats, bags, shoes, shawls, veil, and even household linen. This skill subject has a lot of benefits, not only that the making process is not too difficult, but the materials used are also very easy to get. However, the making process requires a good imagination, high perseverance, and comprehension or application of design basic knowledge that students get from previous subjects.

2 THEORY OF CREATIVITY APPROACH

According to David Cambell, there are three categories of creativity characteristics, which are:

- 1) Main characteristics: the key to generate ideas, views, inspirations, solutions, new ways, inventions.
- 2) Possible characteristics: that which makes it able to retain creative ideas, once it has been found it still stands alive.
- 3) Side characteristics: it is not directly related to the creation or keep the ideas that have been found alive, but often affects the behavior of creative people.

Reni Akbar Hawari in her book entitled *Keberbakatan Intelektual* stated that the characteristics of creativity are as follow:

- 1) Has a deep curiosity
- 2) Often asks substantial questions
- 3) Expresses a lot of ideas, solutions to a problem
- 4) Enable to express opinions spontaneously and confidently
- 5) Has / appreciates a sense of beauty
- 6) Is prominent in one or more field of study
- 7) Enable to find solutions of a problem from various perspectives
- 8) Has a sense of humor
- 9) Has a sense of imagination
- 10) Enable to propose thoughts, solutions to various problems differing from other people (original)
- 11) Is fluent in producing various ideas
- 12) Enable to face problems from various perspectives.

Creativity does not arise spontaneously but through a process. The process of creativity, according to Bobbi De Porter & Mike Hernacki (2001: 31) in their book *Quantum Learning*, flows through the following five stages:

- 1) Preparation: defines problems, goals, or challenges
- 2) Incubation: digests the facts and cultivates them in mind
- 3) Illumination: urges to surface, ideas emerge

- 4) Verification: makes sure whether the solution really solves the problem or not
- 5) Application: takes steps to follow up the solution

3 LEARNING OUTCOMES

Learning outcomes are everything students can do or master as a result of learning (Nasution, 1999). Learning outcomes are the behavioral changes that students gain after learning activities. The obtainment of these behavioral change aspects depends on what the students have learned. Learning outcomes achieved by students in school is the goal of learning activities.

According to Bloom, the taxonomy of learning outcomes include three areas, namely the cognitive, affective and psychomotor. Kratwohllasserts that affective learning is a learning result that is difficult to measure. This learning objective is related to feelings, attitudes, interests and values / categories of affective learning objectives, namely: acceptance, assessment, organizing ability, and lifestyle formation.

Slamento in Harminingsih (2008) states that the students' learning outcomes are influenced by two main factors, which are the factor from within the students (internal) and factor that comes from outside of the students or environmental factors.

According to Sadiman, the learning outcomes are the change of behavior in students, which concerns both the changes that are knowledge-based (cognitive), skills-based (psychomotor) as well as related to values and attitudes (affective).

According to Hamalik (2008), learning outcomes are the change of behavior in a person that can be observed and measured in terms of forms of knowledge, attitudes and skills. The change can be interpreted as an occurrence of good enhancement and development from not knowing to knowing something.

4 RESEARCH METHOD

This study used quantitative method by conducting experiment on 172 XII's grade students of Vocational High Schools (SMK) in Jakarta as a sample, meanwhile data processing was conducted

by using correlation in the form of relation between variables by using questionnaires.

This instrument was tested previously before being applied directly on the study sample. This instrument was tested on vocational students who enroll in decoration making subject outside of the population or sample used or research sample in total of 20 students. Calculation of the items' validity was conducted with product moment correlation, because the instrument is in questionnaire form, that is:

$$r_{xy} = \frac{n \sum XY - (\sum X)(\sum Y)}{\sqrt{\{n \sum X^2 - (\sum X)^2\} \{n \sum Y^2 - (\sum Y)^2\}}}$$

Explanation:

r_{xy} : correlation coefficient between x and y

X : items score

y : total score

N : size of data

The reliability of the instrument as a measuring tool is the ability of the instrument to give a constancy in measuring a symptom. The calculation of the reliability coefficient of creativity instrument was performed by using Alpha Cronbach test with the following formula:

$$r^{11} = \frac{k}{k-1} \times \left\{ 1 - \frac{\sum S_i^2}{S_t^2} \right\}$$

Explanation:

r^{11} = reliability coefficient

k = the amount of questions

$\sum S_i^2$ = the amount of score variants

S_t^2 = total score variants

5 RESEARCH RESULTS

Based on the data obtainment which was measured by using affective and figural test instruments, a score range of 6.5 with the highest score of 23 and the lowest score of 16.5 was gained. Based on the data analysis, it was found that the average score was 18.55. The creativity score with the highest frequency was 39 at interval 18.3-18.8. The lowest frequency was 3 at interval 22.5 to 23.3. The distribution of creativity score can be seen from the following table:

Table 1: Distribution table of creativity frequency score.

Score Interval	Median	Absolute Frequency	Relative Frequency (%)
16.5-17.3	16.9	13	7.55%
14.4-18.2	17.82	22	12.79%
18.3-18.8	18.55	39	22.67%
18.9-19.7	19.3	34	19.76%
19.8-20.6	20.2	35	20.34%
20.7-21.5	21.1	19	11.04%
21.6-22.4	22	7	4.06%
22.5-23.3	22.9	3	1.74%
TOTAL		172	100%

The result of simple linear regression analysis that had been executed on the basic design competency variable with learning outcomes of decoration making generates regression "b" of 0.99 and constant "a" of -9.3. Thus, it could be concluded that the relation between design creativity variables and learning outcomes of decoration making can be described in the following regression equation: $\hat{Y} = -9.3 + 0.99 X_1$.

The F test was executed to examine the level of simple regression equation significance and linearity, which is shown in following table:

Table 2: Anava table for significance and linearity of regression equation tests.

Source of Variants	df	Total Quadrate (TQ)	Average of Total Quadrate (ATQ)	F _{count}	F _{table}
Total	172	927799			
Regression (a)	1	922437.3			
Regression (b/a)	1	1639.44	1639.44	17.42	3.90
Residue	170	5362	94.07		
Linearity Deviation	17	-897171.7	-52774.80	-0.90	1.73
Standard Errors	155	902533.7747	5822.7		

**Significant Regression Analysis ($F_{count} = 17.42 > F_{table} = 3.90$)

Linear Regression Analysis ($F_{count} = -0.90 < F_{table} = 1.73$)

From the test above, it could be concluded that the relation between creativity (X) and the design learning outcomes (Y) was very significant either simply or partially. It can also be interpreted that the higher the creativity of the students was, the higher the work in making the design will be.

Therefore, there was a positive significant influence between creativity and design learning outcomes. It was proven by a simple linear regression equation $\hat{Y} = 43.3 + 1.55 X_2$ whose significance was tested at $\alpha = 0.05$. From the result of a simple correlation, it is found that the score of $r_{y2} = 0.323$ and the determination coefficient $r^2_{y2} = 0.104$. This shows that 10.4% of design learning outcomes is determined by creativity.

Therefore, it can be interpreted that the higher the creativity of students of Vocational High School, the higher the score of learning outcomes in the decorative design subject. On the contrary, the lower the creativity of students of Vocational High School, the lower the score of learning outcomes of students in the decoration making subject.

Creative learning has become an important part in improving the learning quality. The essence of creativity is producing something new, even better. Creating something will continue to provoke students' imagination. The teacher has an important role in introducing and developing creative thinking in students. There is no harm to try some of following list above:

1. Appreciate students' unusual questions and fantasies. Actively asking is one form of student creativity. They tend to be critical and like to criticize everything. Their imagination is very extraordinary that will amaze us. As facilitator, you should not limit the ideas and things they curious to know about. Give the best answer and try to associate it with daily activities.
2. Try to be visual. After all, seeing pictures and colors will be more interesting than writing. Give and show inspirational painting, pictures/photos, and videos to students then ask them to make a story about what they see frequently will give good seduction to their brain.
3. Creative games. Make the variance of study activity by applying creative games. This creative games can be done by trying things that students like. For example, try role playing as detective, vocabulary games, musical, debate, and much more. In addition, you can use learning media as origami paper, plasticine, puzzles, and so on.
4. More projects. You can balance the theory and practice by giving project to students. From a project, students will use their

imagination a lot and have the chance to express their creative ideas. Students will also be provoked to find solutions for each ongoing project.

5. Make exhibition of student's work. Make exhibition of what students make at classroom or even school will be great appreciation to the students. Students will feel valued and encouraged to be more creative. The class atmosphere will be more energetic and colorful.
6. Use music. Play various types of music and ask students to visualize them. You also may invite students to try to understand the lyric and make short story of the song.
7. Learn history in a fun way. Write a dialogue scene between historical and modern figures. Not only that, you can also make a drama to enhance students' imagination by playing role. Besides drama, you can take a tour of the museum so students may see and understand more about historical event.
8. Do simple experiments. Can you dissect animals or make simple electrical circuits? Students will find it easier to understand lessons by practice rather than theory only.

Developing student's creativity can be done by conditioning or building an atmosphere that triggers the ability to think and work. The basis is mastering knowledge and also applying those knowledge in the form of skills. The teacher can also give a recommendation to students to access thousands of video lessons and question in class to support children's learning activities.

6 DISCUSSION

6.1 Creativity is Grown Not Formed

The ministry of education and culture Anies Baswedan said, "Creativity is something that is grown and not formed by government. So it requires space to grow starting from home and schools". Therefore, Ministry of Education and Culture encourages schools to make room for students' creativity. Both teacher and parents have an important role in growing children's creativity. Enough room for students' creativity, supported by the guidance of teachers and parents will create a creative habit. So that creativity gets a place at home and school.

Ministry of Education and Culture said, "The National Examination (*Ujian Nasional – UN*) no longer determines student graduation, so it will open the space for the expression school." He also mentioned that the current education curriculum in schools not only regulates intra-curricular activities but also extracurricular and non-curricular activities.

"The way to assess students need to be changed because the way to evaluate them encourages behavior change. When drawing, lessons become a determinant of graduation, drawing guidance will emerge. Ministry of Education and Culture gave an example of Sweden that in 1766 already provide a space for freedom of expression in the form of Media Freedom Law. Since 1766, Sweden has been able to cultivate the creative culture of its citizens. As predicted, current in present, the creative industry in Sweden is very advanced.

The Ambassador of Sweden to Indonesia, Johanna Brismar Skoog said that cultural diversity in Indonesia is very diverse and amazing. "Indonesia has an extraordinary diversity of cultures. "Something that other countries do not have," explained Ambassador Skoog. Skoog believes media freedom since 1766 has increased the critical power and creativity of people. Skoog said that creativity is also making Sweden able to innovate in various fields. Skoog mentions that in the communications sector there are Swedish companies that rank at the top; such as Ericsson, the automotive companies, Scania. "Creativity opens the way of sustainable development. We believe that Indonesia will be the center of world creativity because it is very rich in culture."

One pedagogic theory (teaching science) explains that the success of learning in class depends on the quality of teacher, quality of teacher is depending on the quality of principal, quality of principal is depending on the quality of education supervisor, and so on up to the vertical upwards, Head of Education Service and The Ministry of Education itself.

Why so? The logical argument can be directed at the central role of stakeholders (related parties). Students are individuals who need guidance and teacher is the guidance from every material and values of life taught. Likewise, with the position of school principals and education supervisors who have full responsibility to improve the quality of educational human resources.

To make the quality of education that is integrated with the progress of the times, education stakeholders must have the creativity to develop the way of learning. Creative learning will make the creative generation, facing the progress of the times that keep developing.

In this point, teacher need to help student to develop their critical thinking so it may create generation with high creativity in every aspect in life. However, at the level of students, developing the creativity in life is more crucial so that they may prepare themselves better when facing the future.

According to Professor of Emiritus Education Prof H.A.R Tilaar (2012), student really need to develop their creative thinking so students may grow into the generation with entrepreneurial spirit. We hope that the entrepreneurial spirit is no present from empty space, but grown rough the habit of thinking critically, creatively, and complex thinking.

How? Of course to answer this question we require creative educators who are able to develop teaching material into the riving force of creativity in thinking students through various learning methods.

For example, He explained that the embryo of creative thinking is present when the curiosity is epistemologically always residing in the teachers. This stage of thinking is the basis of critical thinking from a teacher. Critical-thinking teachers cannot accept as they have been studied or delivered by experts.

From this process, it can be understood that a critical teacher will question the provisions that are considered standard and no need to be questioned anymore. This standard attitude will not produce changes in society. It is at this point that creativity is born from the critical thinking stage of everything that is considered standard.

6.2 Creativity and Entrepreneurship

Creativity which is the embryo of human entrepreneurship is not in one particular field; for example, business and trade. Currently, people identify entrepreneurship only with groups that are capable and successful from business and trade aspects. Even if you look at the stages above epistemologically, the area of entrepreneurship is on the level where people always think critically and creatively so that they create things that are useful for their society.

If there is a writer who is so productive; writing books, articles in various print media, online, and many more, they can be defined as human entrepreneurs. If measured materially, of course they produce money from the effort of writing. Furthermore, they succeeded in understanding a science through their writings. Likewise, with other fields which give benefits for people's lives.

Entrepreneurship lies in the soul and the way of thinking. The success of the results of thinking and enthusiasm is a result that is driven by an action. So, if humans still have a soul and critical/creative way of thinking that is oriented to the good of humans, at that point we define them as entrepreneurship. Likewise, for a teacher and all education stakeholders, both in the field of preparation of teaching materials, learning methods, curriculum, instruments, and others.

It is undeniable that 21st century humans are human beings who are open (inclusive), not bound by previous provisions which are all standard. He must have a new epistemology that does not take for granted positively the things he faces. Here, human beings think positively against the current. This critical attitude is what makes humans able to think creatively so that this process can be defined as the foundation of creativity and entrepreneurship.

Development of creativity and entrepreneurship should be a goal for a teacher, principal, supervisor, parents, and the entire community. Primarily in the learning process at school, teaching material and curriculum must be directed to the growth and development of students' creativity. The process of manifestation of creativity indeed is not easy even the process of internalization can take so long if it is practiced incorrectly and not meaningful.

Because the meaningfulness is the main criterion in developing creativity, indeed teachers let students to explore their competencies. In a meaningful manner, the teacher let the creativity seeds of the students grow well. So, it can be said that creative thinking will produce entrepreneurial humans; substantive way of thinking.

7 CONCLUSION

This study suggested that there is a positive significance influence between creativity and design learning outcomes. It is proven by a simple linear

regression equation $\hat{Y} = 43.3 + 1.55 X_2$ whose significance was tested at $\alpha = 0.05$. The result of simple correlation concludes that the value of $r_{y2} = 0.323$ and the determination coefficient of $r^2_{y2} = 0.104$. It shows that 10.4% of design learning outcomes is determined by creativity. Thus, it can be interpreted that the higher the creativity of Vocational High School students, the higher the score of learning outcomes in the decorative design subject. On the contrary, the lower the creativity of Vocational High School students, the lower the students' learning outcomes in the decoration making subject.

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