Identifying Students' Creativity in the Higher Education Classroom

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Abstract: Creativity is one of skills higher education institutions (HEIs) need to develop of the students to address challenges of the 21st century. Through the development of creativity, it is expected that students can meet the ever more complex demands of the workplaces. The identification of students' creativity is necessary in order for the HEIs to be able to design an effective instructional program to develop it. This creativity identification is also needed to support the implementation of a product-oriented education. Based on the results of identification, it was revealed that generally students' creativity could be said as being at the level "ordinary/routine". The fluency aspect was at the highest level of creativity. It goes to say that students' creativity could still be improved to the level of creative or very creative. It was also revealed that students relatively were unable to recognize the importance of a deep knowledge base and continual work to learn new things the strongest aspects were the openness to new ideas and the active search for new ideas. It can be concluded that there should be attempts from the lecturers to develop students' creativity.

1 INTRODUCTION

Creativity remains one of the main issues in efforts to improve the instructional process in higher education institutions (HEIs). Like at other levels of education, students' participation is necessary to improve the quality of education at HEIs (Sanjaya, 2005; Uno, 2010; Rusman, 2010).

A well-designed instructional process will enable students to explore their potentials (Fardah, 2012; Plucker et al., 2010; Beghetto, 2010; The Centre for Cultural Policy Research, 2005). It means that creativity is crucial for the skill acquisition because it is not merely responding to the feedbacks provided by the lecturer during the lesson.

An initial identification of students' creativity is necessary to design a lecture program that can improve it because the students will be assigned to develop tutorial book on how to develop educational graphic media.

This identification is aimed at figuring out students' initial creativity level needed to improve the quality of learning. Once it is identified, the lecturer could design a lesson suitable for them.

2 LITERATURE REVIEW

2.1 Creativity

It is generally acknowledged that creativity is one of important skills to face the 21st century. The ability to think creatively is one of skills needed to support learning and innovative skills (www.P21.org/Framework).

Creativity can be formed and influenced by several factors. It is an interaction result between talent, process, and environment that can be done either individually or in groups to produce a product, be it a new product or a modified one, that is useful for the society (Plucker et al., 2010; Plucker et al., 2004; Morgan and Forster, 1999).

Brookhart (2013) describes a creativity as a simple concept that becomes complex once a thought is focused on finding an original and high-quality idea. Creativity is not only an innate ability, but also is influenced by environment and a repeatedly done process, so creativity is well-established and becomes an individual habit (Sternberg, 2012). Thus, a structured and continuous effort is required to develop creativity so that

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creativity continues to develop and eventually becomes an individual character.

Creativity can basically be seen in someone who is open to new experiences (Brookhart, 2013; Feist, 2010), confident in his own creativity (Beghetto, 2010), knowledgeable, motivated, aware of any potential risk he is facing, be able to deal with criticism well (Plucker et al., 2010).

2.2 Measuring Creativity

A creativity measurement is developed to establish criteria of creativity level (Brookhart, 2013). Although creativity tests vary in their content and systematics, their categorization of the test responses are relatively similar in that they measure fluency, flexibility, originality, and elaboration. Brookhart's (2013) creativity measurement model determines four levels of creativity: very creative, creative, ordinary/routine, and imitative. This measurement considers four different areas: variations in conveying ideas, variations in finding the resources needed, novelty in combining ideas, and novelty in conducting the communication process.

Guilford developed another model that can be used to measure a person's divergent production. This model measures the creativity in terms of task completion pace. Fluency is measured based on the numbers of responses provided by the students, flexibility is measured based on how many types of responses provided by the students. originality is measured based on the unusualness in the students' responses, and elaboration is measured based on how detailed the students' responses are.

The present study was aimed at measuring the initial creativity level of students in their first year. To this end, Guilford's (1987) measurement criteria were adopted with the addition of Brookhart's (2013) five measurement criteria.

3 METHODS

This study was the first phase of the three phases of research that will be carried out. The aim was to identify the initial level of students' creativity. The participants were 47 second semester students, consisting of 27 females and 20 male students, enrolled in a bachelor degree program. To achieve the aforesaid purpose, a descriptive analysis method was employed. This method describes and analyze research data that should be correctly interpreted. This study was conducted in three phases. The first

phase is creativity identification, the second phase is data analysis, and the last one is conclusion drawing.

Students' creativity was measured using Guilford's creativity test and a questionnaire that was developed with reference to Brookhart's (2013) creativity criteria: ability to recognize the importance of a deep knowledge base and continually work to learn new things; openness to new ideas and active search for them; ability to find source material in a wide variety of media, people, and events; ability to organize and reorganize ideas into different categories and combinations and then evaluate whether the results are interesting, new, or helpful; and ability to use trial and error when they are not sure of how to proceed, viewing failure as an opportunity to learn.

4 RESULTS

The results of data analysis are divided into two categories: students' self-assessed creativity level obtained through questionnaires and the creativity level measured by Guilford's test.

4.1 Basic Level Creativity Test

Students' creativity is measured from graphics developed by the students using Guilford' test. The test results are presented in Table 1.

Table 1: Identification of students' creativity.

ASPECT	SCORE
Fluency	3.28
Flexibility	2.19
Originality	2.55
Elaboration	1.85
Ẋ	2.47

The measurement score was done in a scale of 1 to 5. The score of 1 indicates the lowest creativity level, and 5 indicates the highest.

The average score of overall aspects was 2.47. It means that the average students' creativity is at the "ordinary/routine" level. With a score of 3.28, fluency was at the level of "creative," the highest if compared with other aspects. With a score of 1.85, elaboration was at the level of "ordinary/routine." It was the lowest one if compared with other aspects.

However, no one of the participants was at the level or "imitative." As many as 30 students were at the level of "ordinary/routine," and 20 students were

at the level of "creative," but no one was at the level of "very creative."

4.2 Students' Self-Assessed Creativity

In addition to Guilford's test, the measurement was also done through a Likert scale questionnaire. This questionnaire was developed with reference to Brookhart's (2010) creativity criteria: (1) ability to recognize the importance of a deep knowledge base and continually work to learn new things, (2) openness to new ideas and active search for them, (3) ability to find source material in a wide variety of media, people, and events, (4) ability to organize and reorganize ideas into different categories or combinations and then evaluate whether the results are interesting, new, or helpful, (5) ability to use trial and error when they are unsure how to proceed, viewing failure as an opportunity to learn. What follows is the result.

Table 2: Students' self-assessed creativity.

NO	ASPECT	AVERAGE SCORE
1	Ability to recognize the importance of a deep knowledge base and continually work to learn new things	3.15
2	Openness to new ideas and active search for them	3.63
3	Ability to find source material in a wide variety of media, people, and events	3.54
4	Ability to organize and reorganize ideas into different categories or combinations and then evaluate whether the results are interesting, new, or helpful	3.28
5	Ability to use trial and error when they are unsure how to proceed, viewing failure as an opportunity to learn	3.20

The average score of each of these aspect is obtained by computing the average of overall scores of statement items of the respective aspect.

Table 3: Ability to recognize the importance of a deep knowledge base and continually work to learn new things.

No	Statement	
A	**Ability to recognize the importance of a deep knowledge base and continually work to learn new things**	**3.15**
1	I like to read about how to create something	3.82
2	I love to draw a certain object	3.33
3	I love to write information that may be useful for others	3.73
4	I find it hard to express ideas in writing	3.33
5	I always avoid drawing	2.61
6	Reading about how to create something is just a waste of time	2.14
7	I can operate a lot of computer software to create things	3.10

With an average score of 3.15, students' ability to recognize basic knowledge to write a tutorial book could be said sufficient.

Table 4: Openness to new ideas and active search for them.

No	Statement	
B	**Openness to new ideas and active search for them**	**3.63**
8	I love to see the works of famous people	4.02
9	I will be glad if my works receive constructive criticisms	4.10
10	I accept the criticisms, but I ignore them when creating a new work	2.78
11	I find new ideas from reading or seeing the works of others	3.88
12	I find new ideas by contemplating	3.35

With an average score of 3.63, the students could be said open to new ideas and actively seek them out.

Table 5: Ability to find source material in a wide variety of media, people, and events.

No	Statement	
C	Ability to find source material in a wide variety of media, people, and events	3.54
13	I love to befriend with many people, so I can learn creative ideas from them	3.92
14	I get informed and find creative ideas from ...	
	a. Printed mass media	33.33%
	b. Television	39.22%
	c. Radio	5.88%
	d. Internet	49.02%
15	I frequently attend an event to find new creative ideas.	3.16
16	Events I frequently attend	
	a. Seminar	23.53%
	b. Workshop	39.22%
	c. Bazaar	33.33%
	d. Other events. Specify: ...	5.88%

3.54 is an average score of this indicator. It means that can find ideas from various sources such as people they encounter, mass media, and events they attend.

Table 6: Ability to organize and reorganize ideas into different categories or combinations and then evaluate whether the results are interesting, new, or helpful.

No	Statement	
D	Ability to organize and reorganize ideas into different categories or combinations and then evaluate whether the results are interesting, new, or helpful	3.28
17	I can develop creative ideas to produce a work that is different from that of others / existing ones	3.43
18	I can develop a product by imitating the works of others	3.12
19	I developed an interesting and useful creative idea by combining ideas from various sources	3.80
20	I like to write about how to create something	3.04
21	I have many ideas to write/create a product	3.00

With an average score of 3.28, students can be said to have self-confidence to organize and reorganize ideas into different categories or combinations and then evaluate whether the results are interesting, new, or helpful.

Table 7: Ability to use trial and error when they are unsure how to proceed, viewing failure as an opportunity to learn.

No	Statement	
E	Ability to use trial and error when they are unsure how to proceed, viewing failure as an opportunity to learn	3.20
22	I like to work by modifying predetermined methods	3.55
23	I think trying out new and unproven methods is just wasting time, power, money	2.57
24	I write about a newly found method and disseminate it	3.02
25	When creating something, I always work in accordance with the instruction available in the source I use	3.49
26	I find it difficult to follow the instructions available in the source I use	2.88
27	I love making experiments even if the result is below my expectation	3.67

The first four indicators were the main indicators of an individual's creativity, and the fifth shows how students approach taken by students to solve problems. With a score of 3.20, the students can be said to be used to making trial and error. Put it simply, students seemed to consider failures as parts of learning.

5 DISCUSSION

The results of the study showed that generally students' initial creativity level varied. Referring to Guilford's four creativity criteria, students can be said to have ability in generating new ideas.

Based on Brookhart's test, students can draw all spheres with different types of images. However, they tend to be homogeneous and less varied. It goes to say that basically students' creativity level varied. Their creativity level can be seen in different shapes. Generally, Guilford's testing showed that students' creativity levels were not sufficient. Every aspect tended to be varied. No one of the participants was at the level or "imitative." The majority of students were at the level of "ordinary/routine," and the rest

were at the level of "creative," but no one was at the level of "very creative."

The results revealed that students were able to recognize the importance of a deep knowledge base and continually worked to learn new things, very open to new ideas and actively sought them out, able to find source material in a wide variety of media, people, and events, and able to organize and reorganize ideas into different categories or combinations and then evaluate whether the results are interesting, new, or helpful.

Their ability to conduct trial and error in addressing a problem shows that students were able to see failure as a part of learning process and that they did not easily give up.

6 CONCLUSION

Based on the results of data analysis, it was concluded that students could be said to be creative enough to be assigned to create a tutorial book.

The identification process became a way of analyzing students' characters. It was done to optimize their learning achievements.

Creativity measurement at the beginning of lecture program could provide general information about students' creativity level.

Students with high creativity level could be assigned to solve problems appropriate with their level of creativity. The lecturer could freely determine teaching and evaluation methods. Students' low creativity could be improved through various efforts, one of which is by assigning them to create a tutorial book.

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