

## **Assessing Creativity of Senior High School Students in Learning Biology Using Online Portfolio Assessment on Facebook**

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### *Abstract*

Creativity is a meaningful ability and demands in improving the quality of education to produce creative learners. Assessment of creativity in the learning process is needed to contribute positively to the process and the achievement of learning outcomes in the development of creativity. This study aims to assess creativity of high school students using online portfolio assessment on the Facebook network in human motion system concept. This research was conducted at one of State Senior High School in Tangerang City. The research method used descriptive quantitative. The subjects of this study were 38 students of class XI Math & Science. Instruments used are rubrics creativity and self-assessment sheets. We made a set of rubrics for assessing student creativity for poster and practicum report which uploaded on facebook. Creativity indicators consist of fluency, flexibility, originality, and elaboration. The result of the research shows that the creativity level of students is in a good category. We found student creativity in making poster is better than practicum report. we assumed this is because students have the freedom of expression in making posters rather than preparing more standardized practicum reports.

Keywords: creativity, online portfolio assessment, facebook,

### **INTRODUCTION**

Many definitions of creativity have been put forward since then, but because creativity is complex and multifaceted in nature, there is no single, universally accepted. Treffinger in 1996 reviewed and presented more than 100 different definitions from the literature (Treffinger et al., 2002, p. 5). Plucker et al. (2004) cited in Kaufman, Plucker, & Russell (2012, p. 61) creativity is the interaction among aptitude, process, and the environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context. Runco & Jaeger (2012, p. 92) state that the standard definition of creativity is bipartite: Creativity requires both originality and effectiveness. There are many different definitions in which the experts emphasize different elements or factors in creativity. It is also clear, that whatever aspect of creativity receives emphasis in any definition will have specific implications for how one seeks to assess that conception of creativity. (Treffinger et al., 2002, p. 8).

Treffinger et al. (2002, p 11) recognizing that creative behavior is influenced by motivational as well as situational factors, they clustered their final list of characteristics into four categories can be seen in Figure 1: generating ideas, digging deeper into ideas, openness and courage to explore ideas, and listening to one's "inner voice." the characteristics in the category *generating ideas* include fluency, flexibility, originality, elaboration, and metaphorical thinking.

Student creativity development is needed in the learning process that aims to equip the young generation in facing various problems and challenges of life in the future. The problem is that schooling often stops short of encouraging creativity; teachers and testers are often content if students have the knowledge. (Sternberg, 2012, p. 4)

A good learning process is to train the ability to think creatively so that learners become a creative person. The characteristic of a creative person is to have creative behavior resulting from creative thinking. The education system should be able to stimulate thinking, attitude, and productive-creative behavior, in addition to logical thinking and

reasoning (Munandar, 1992, p. 47). The level of creativity will increase if the ability of creative thinking is often used and if not channeled, then the potential for creativity decreases. Although everyone has a creative talent if not nurtured, the talent will not develop, it can even become a hidden talent that cannot be realized (Munandar, 1992, p. 52).

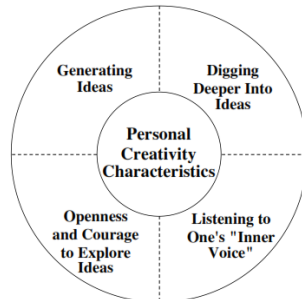


Figure 1. Personal Creativity Characteristics (Treffinger *et al.*, 2002, 12).

Barbot *et al* (2011, p. 125) stated that creativity involves a combination of cognitive (information processing), conative (personality traits, motivational aspects), and emotional factors (affective state, trait) that are interacting dynamically with the environment (which stimulates or inhibits the expression of creative potential) resulting in the uniqueness of the creative process and product. In terms of student creativity, teachers are responsible for carrying out assessments and providing feedback on student learning outcomes. Outcomes are the products and ideas that result from people's effort (Treffinger *et al.*, 2002, p. 20).

Creativity assessment developed along with the evolution of the concept of creativity, and along with the questions that researchers addressed when developing their tools (Barbot, Besançon, & Lubart, 2011, p. 125). One assessment tool that can be used to assess creativity is the portfolio (Lindström, 2007, p. 89). Portfolios can be used to view student progress over time based on a collection of works from learning activities. Portfolio assessment is one form of assessment that assesses students objectively, comprehensively, and accurately in accordance with the evidence they have.

Portfolio assessment requires a lot of time to access, is static data, and requires adequate storage, especially when the number of learners is large enough (Irawan, Astra, & Bakri, 2012, p. 301). Utilization of technology as a medium in a portfolio can make a solution to apply it (Gibson & Barrett, 2003, p. 559). That is a computer-based portfolio or e-portfolio or web-portfolio. What is an e-portfolio?

An e-portfolio is a digitized collection of artifacts, including demonstrations, resources, and accomplishment that represent an individual, group, community, organization, or institution. (Lorenzo & Ittleson, 2005, p. 2). Several studies have shown that e-portfolio is effectively used as a tool for assessment (Pitts & Ruggirello, 2012; Irawan, Astra, & Bakri, 2012; Parkes, Dredger, & Hicks, 2013, Bryant & Chittum, 2013).

Mangkulo cited in Aisyah (2013, p. 3) reveals that implementing online learning, the school must provide the website for the learning process itself. Use of the website requires a fairly expensive cost and often teachers have difficulty in applying it. By considering the weakness of the website that has been described, in this study used social media Facebook as a substitute for the website. Based on previous research stated that Facebook can be used as an educational tool (Fewkes & McCabe, 2012, 95; VanDoorn & Eklund, 2013, p. 7; Miron & Ravid, 2015, p. 371). Similar studies that have used facebook as a medium for online portfolio assessment are Khairunissa (2011) and Aisyah (2013, p.87).

Basic competence 3.5 in the biology learning system for class XI is to analyze the relationship between the structures of the organizing network so that it can explain the mechanism and disorder of the human motion system. Motion system concept is considered difficult in some students because it needs to understand the processes that take place in it and the relationship between the organs with each other. In this study will apply online portfolio assessment to assess the creativity of students in making the task of posters and practicum reports of disorder in the human motion system that is uploaded on facebook

## METHODS

The research was conducted in one of state senior high school in Tangerang City, in October and November 2016. The research method used descriptive quantitative. The subjects of this study were 38 students of class XI Math & Science, academic year 2016/2017. Instruments used are rubrics of creativity and self-assessment sheets. The rubric of creativity used to assess posters about disorder in human motion system (Table 1) and practicum report (Table 2). Self-assessment of students, to know the results of student evaluation in the form of advantages and disadvantages of his own work (Table 3). The self-assessment sheets were sent via messenger feature on a facebook in the form of yes or no questions.

Table 1. Indicators in the rubric of creativity for Poster

No.	Component of Creativity	Indicator
1.	<i>Originality</i>	Students are able to create posters, the content of the poster produced is different from that shown by the teacher and other students about the motion system.
2.	<i>Flexibility</i>	Students use 3 relevant references and according to the theme of human motion system disorder.
3.	<i>Fluency</i>	Students can inform the disorder of the human motion system through images and writings in posters.
4.	<i>Elaboration</i>	Students are able to present information according to the theme of motion system disorder and provide appropriate colors to reinforce the information in the poster.

Table 2. Indicators in the rubric of creativity for practicum report

No.	Component of Practicum Report	Component of Creativity	Indicator
1.	Aim	<i>Fluency</i>	Determining ideas and ideas about the purpose of the practicum performed.
2.	Basic Theory	<i>Originality</i>	Presents concepts on a different theory basis from other students.
3.	Tools and Materials	<i>Flexibility</i>	Suggests an alternative use of tools and materials in a practicum rarely found by other students.
4.	Work steps	<i>Elaboration</i>	Revealed the work steps of practicum activities that have been done smoothly
5.	Observation Result	<i>Fluency</i>	Revealed the observed data clearly.
6.	Data Analysis and Discussion	<i>Fluency</i>	Analyze the observed data and write the discussion clearly and fluently.
7.	Conclusion	<i>Flexibility</i>	Revealed the conclusion as an answer from the result of the lab

Table 3. Indicator in self-assessment sheets

No	Indicator
1	Preparation stage in poster creation
2	Obtaining ideas in poster creation
3	The things that make products attract

Data analysis is done quantitatively and through descriptive statistics. All subsequent data are integrated to be analyzed thoroughly for the preparation of conclusions about students' creativity assessment.

## RESULTS AND DISCUSSION

In this research, students constructed four portfolios (four posters and four practicum reports) over the four weeks. The following will be presented the results of students' creativity in the form of the average of both tasks.

The students' level of creativity assessment is done by analyzing the students' online portfolio tasks, ie making poster and practicum report. Both tasks are analyzed through student creativity rubrics by making percentages and categorizations based on categories

of creative thinking. The categories were originality, flexibility, fluency, and elaboration.

Based on the results of the analysis, the level of students' creativity in created poster was a good category in each aspect. As shown in table 4. The example of the poster shown in Figure 2. Students' creativity in Practicum reports is quite varied. As shown in table 5. The example of practicum report shown in Figure 3.

Fluency in created posters is evidenced by the relationship to each component in the poster. These components are symptoms, causes, prevention, and treatment as well as information that is easily understood. Information is conveyed through the form of images and writings so that posters are presented interactively and show the creativity of ideas owned by students.

Flexibility is the lowest indicator in created the poster. Generally, students use only one relevant reference and only a few use two relevant references in collecting information for the contents of the poster. Rubric creativity used by students can be said to have the ability to think flexibly if able to use three references to the contents poster. It is intended that the poster that is created contains accurate and reliable information. Nevertheless, the relevance of the poster theme to the content shows that students

are still able to think flexibly so that this indicator is still good category.

Elaboration indicators or detailed thinking is seen from the effectiveness of the text content, and the suitability of colors contained in the poster to reinforce the information in it. On this indicator the average percentage of achievement of 69.73% with the high category. Most students are able to present brief but clear information and color the entire contents of the poster in accordance with one image to another to reinforce the information submitted.

Originality poster is a good category. The average percentage achievement of 63.81%. New ideas that are generated include things that are difficult for everyone to do because they require different ways of thinking to create them but are essential in creativity. Based on the two types of online portfolio tasks analyzed, the task shows a better level of creativity than practicum reports. This is evidenced by the average level of creativity in created poster got percentage 67.43% while the preparation of practicum report 59.46%.

The task of created posters and practicum reports is chosen because it is able to explain the level of creativity of writing in two different things, namely textual and visual. Practicum reports as a tool for measuring textual creativity, and posters as visual creativity tools. Aziz (2012, 65) has proven that learning creativity is more appropriate when integrated with writing skills. Writing activities will train students' creativity.

Table 4. Student creativity level in making poster disorder of human motion system

No	Component of creativity	Percentage (%)	Category
1	Originality	63.81	Good
2	Fluency	73.68	Good
3	Flexibility	62.50	Good
4	Elaboration	69.73	Good
Average		67.43	Good

When created poster, students are able to use their creativity in presenting new and unique information, effective content and color suitability so there is an interest to read it. Students combine various elements and display them in a different format from their friends. The highest creative thinking indicator that students achieve in created the poster was fluency with the percentage of 73.68%. The lowest indicator was in the flexibility indicator with a percentage of 62.50%. Both indicators are good categorized.

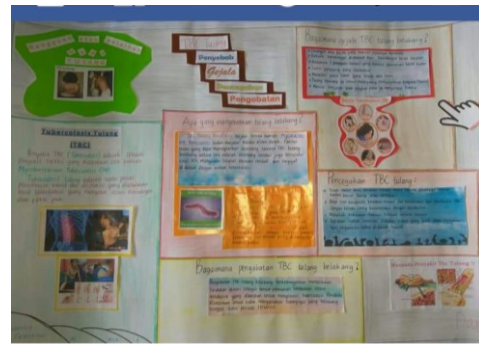


Figure 2. Example Poster created by the student

Table 5. Student Creativity Levels in Practicum Report Tasks

No	Component of creativity	Percentage (%)	Category
1	Originality	30.92	Very less
2	Fluency	53.29	Sufficient
3	Flexibility	72.04	Good
4	Elaboration	81.58	Very Good
Average		59.46	Sufficient

Practicum report has a varying percentage on each indicator. The highest indicator of students' creative thinking is elaboration with a percentage of 81.58% (excellent). The lowest indicator is in originality indicator with the percentage of 30.92% (very less category).

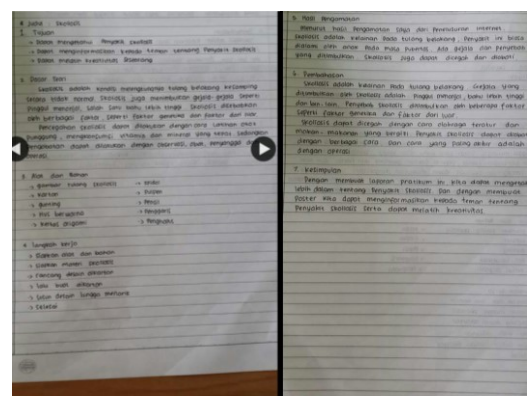


Figure 3. Example of a practicum report made by a student

The results that prove the difference in the level of students' creativity in created poster and the practicum report also illustrate students' interest in both tasks. The level of creativity in practicum report



is indeed lower, but using online portfolio can be one solution to create more compelling writing tasks through online media and allowing students to develop creativity.

Advantages of the online portfolio through Facebook not only can assess creativity but also can improve students' learning motivation. By the students uploading images to Facebook when they are at an attraction, more can be known about the learning process, and feedback can be offered throughout the process to guide them along the way, rather than provision of feedback only on the finished report (Backer, 2010, p. 24). Thus, simplifying the process and learning experience because in general learning is done conventionally. Students have pride in the task it produces and publishes it into Facebook. Other advantages train teachers and students to be responsible for the tasks in learning. Students are responsible for the tasks done and the teacher on the assessment as a fair and objective feedback without reducing the creativity of students.

## CONCLUSIONS

Based on the results of research and data analysis has been done, it can be concluded that the level of creativity of students by using online portfolio assessment on Facebook was a good category. This can be seen from the results of the two tasks performed, the average percentage level of creativity of students in a created poster of 67.43% with a good category, and practicum reports of 59.46% with sufficient category.

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