The Influence of E-Portfolio Task Through the Facebook Network on the Creativity of Junior High School Students

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Abstract

This study aims to determine the influence of the use of e-portfolio tasks through the Facebook network on the creativity of students in the subject of physics in junior high school. One Group Pretest-Posttest research design was used in the quasi-experimental research type, which included 31 first-year students (Grade 7), selected by purposive sampling for the research sample. Data collection techniques were conducted using tests, performance assessment, portfolio assessment, observation, and teacher interviews. Data analysis was conducted with the use of correlation test and correlation hypothesis test. T-test was used to analyse the data collected. The result from the post-test showed that there was a positive and significant influence on the students' creativity in physics. Based on the results of data analysis, the obtained correlation coefficient was 0.99965 with very strong correlation interpretation, and $t_{\text{count}} > t_{\text{table}}$. Thus, it can be concluded that there was a positive and significant influence of the e-portfolio tasks through the Facebook network on students' creativity in physics lessons at junior high school.

Keywords: *creativity portfolio task, Facebook, physics*

Introduction

In the learning process, the steps taken by the teacher to determine learners' ability are the process of evaluation or assessment of student learning outcomes.

However, assessment is very often made only in the cognitive aspects of students, thus the assessment of students' creativity becomes impeded. This is not in line with the system of the Curriculum 2013, which aims to create learners who have good skills of creative thinking, which is part of Higher Order Thinking Skills (HOTS). It can also inhibit one of the major goals of the 21st century education system, which is to develop and improve students' high-level thinking skills (Collins, 2014).

Research Problem

HOTS in the aspect of creativity is still difficult to achieve, although in fact it has been presented theoretically. Related to this, there is a relatively common local problem that often occurs, among other things, the problems associated with the existence of differences in learning orientation, the atmosphere of learning environment, and the uniqueness of each student (Seixas, 2017). In addition to this, the main problem that often arises in the improvement of creativity lies in the orientation of learning systems conducted by teachers and students, where in this case the most emphasized and preferred is the perfect cognitive skill (Weay & Masood, 2014).

Creative thinking skills are an ability to create something new and unheard of. In this case, there are four main aspects which are the characteristics of creative thinking, namely fluency, originality, elaboration, and flexibility (Greenstein, 2012). In addition, creative thinking skills also increase the ability to think better when combined with one of the HOTS aspect, namely critical thinking. One form of creative thinking skills combined with the critical thinking skill is students' ability to obtain information and ideas to solve the problems in science using scientific methods (Syukri et al., 2018).

In addition, one of the main functions of national education is to develop the potential of learners to become creative human beings (Law of Indonesian Republic, 2003). Thus, it can be said that creative thinking skills can be learned and developed through education (Sharp, 2004; Cachia et al., 2010; Dyer et al., 2011).

In general, it can be concluded that the development of student creativity is needed in the learning process for the development of HOTS in the education system. One way to assess students' creative thinking skills is through creative products resulting from the learning process (Evans, 1994), and to demonstrate the potential aspects of creativity that students have in the work they have created (Munandar, 2002).

In order to overcome these problems, some researchers have attempted to promote HOTS through methods of developing the skills and role of teachers

(Dorren, 2004), student learning activities (Pattiz, 2004), evaluation of student learning outcomes (Demircioglu, 2009), and student experiences in learning (Kim & Seo, 2015). In addition, students' perspectives in learning can also be met through systematic means, one of which is through the application of student learning material enrichment and using more book references in presenting the material (Drake & Brown, 2003).

One of the steps teachers can take is to implement an evaluation system with the use of technology. Electronic portfolio is a new form of media portfolio that is essential and can be used as an alternative that supports the development of student creativity. This type of portfolio is often referred to as an e-portfolio, a portfolio document that is stored in an electronic format. E-portfolio is an activity that is closely related to learning technology or Advanced Learning Technology (ALT). The technology in question teaches how to use technology to improve the learning process and evaluation system, such as via blogs, web and multimedia-based social networking (Gibson & Barrett, 2003).

Research Focus

The focus of this research was the implementation of learning-and-assessment-based e-portfolio through social media to improve students' creativity in physics at junior high school at Central Aceh, Indonesia. The design of an e-portfolio-based learning model is considered suitable in the development of modern-day learning system and globalization. It is also based on the state of the technological aspect as a social need that has become the main communication for the majority of society in recent times. Accordingly, the internet is also an important part of the life of human communication today in their various activities and routines. More specifically, social media that has revolutionized communication systems more easily is able to quickly transform public communications systems thoroughly (Matthews, 2010).

In this regard, the social media position used by the majority community is among school-age youth. As the evidence indicated by the survey results in 2008, half of the students in the study were completely unfamiliar with Facebook, while in 2009 all the respondents realized that Facebook was very important and 59% of them even used it regularly. Thus, there is an interesting point about Facebook's influence on academic performance (Cavalli et al., 2011).

Based on this, the presented research used an approach of learning in accordance with technological developments and designed a more varied model of learning with combination of social media to measure the level of creativity of students. Basically, the idea of learning activities used is to modify Bloom's taxonomy into

a model of learning that is divided into learning practices in the classrooms and students' self-activities by prioritizing aspects of student creativity in completing tasks through Facebook. Following the work of Gibson & Barrett (2003), the authors believe that an e-portfolio-based learning model can be a component in the development of student creativity.

Research Methodology

Research General Background

The presented research was done at Junior High School in Takengon, Central Aceh. Takengon is a district located in the central province of Aceh and is located on the island of Sumatra, Indonesia. This study used a quasi-experimental design with pre-test and post-test techniques. Experiments were conducted to compare students' creativity levels before using the e-portfolio learning model and assessment after using e-portfolio through the Facebook network. This study involved one class of students as a single sample group at Junior High School in Takengon. Previously, the class had been examined and matching criteria needed in the study were found, as well as the required number of students also met the requirements of normality. A group of students were given pre-test before the experiment in the form of concept map making.

The learning process using e-portfolio was conducted by the researchers and a physics teacher. In this case, the researchers and teacher collaborated in the research undertaken. The reason why this study should involve a subject teacher was to avoid subjectivity of research results. The pre-experiment group was taught with the use of a conservative portfolio learning model, while the post-experiment group was taught with the use of an e-portfolio through Facebook. Lessons lasted three hours per week. This study was conducted for 4 weeks. After completing the experiment, the group was again given a test with the same instrument. Post-test consisted of making mind mapping and a poster on the solar system in the form of Members of the Solar System. The students were asked to make the mind mapping and poster as creative as possible with references that had been given through the Facebook group.

Research Sample

The research sample used in this study was one class at Junior High School in Takengon, Central Aceh. The sample class's academic achievements in physics was tested in advance the and several other criteria were tested such as the extent of

Facebook use and the level of creativity. The sample of this research consisted of 31 first-grade (year 7) junior high school students in Takengon, Central Aceh. The authors used purposive sampling techniques to ensure objectivity and meet the criteria required in the research undertaken.

Instruments and Procedures

The instruments used to collect data for the presented study of creativity skills were pretest and posttest. Tests in the form of mind mapping and posters of the solar system were required in the sample class. The instruments used previously had been tested for validity by expert validators in the areas of creativity. The model procedure used is the following: first, the authors analyzed the previous research and then re-analyzed the theory and concepts related to the instrument to be used. Furthermore, the authors adapted the necessary instruments and definitions. Then, the design of the completed model was tested for its validity by the experts and revised according to the suggestions and input was provided by the validators. After that, the authors drafted the instrument as well as the design of the research activity before the valid instrument was used to collect data. Once the instrument had reached validity, the authors began to collected data. This research used the experimental research design of One Group Pretest-Posttest Design, as shown in Table 1.

Table 1. Design of the research

Pre-test	Treatment	Post-test
O ₁	X	O ₂

Data Analysis

Data obtained from the test were analyzed using quantitative statistics in the form of a correlation test between variables and involving paired-samples t-test type. This was done to compare both groups, the pre-experimental and post-experimental groups. In this case, what was found was the level of the students' creativity before and after the implementation of the experiment. Data processing was done with the use o Statistical Package for Social Sciences (SPSS), IBM SPSS 23.

Research Results

The presented study aims to determine whether the use of e-portfolio through Facebook can improve students' creativity in physics at the Junior High School in

Takengon, Central Aceh. Analysis showed that there was a positive and significant influence of the use of e-portfolio tasks through the Facebook network on the students' creativity in physics at Junior High School in Takengon, Central Aceh. Table 2 shows the mean and standard deviations of the students' creativity level at the pre-test and post-test. This suggests that there were differences in test results of the research sample.

Table 2. Mean and standard deviation (S.D) of the pre-test and post-test

Dependent Variable	Group	N	Mean	S.D
Students' creativity in physics	Pre-test	31	8.08	25.301
	Post-test		11.295	59.335

Based on the data presented, the standard deviations of the pre-test and post-test results show significant differences in the level of the students' creativity. The students in the experimental group obtained a much higher average score than the students in the control group. This means that the use of e-portfolio through Facebook network can significantly improve students' creativity in physics.

Table 3 presents the results of a t-test of dependent variables in terms of student creativity in physics. There was a positive and significant influence in the student's creativity in physics, with $t(29) = 5.396$, $p = 0.05$. Therefore, the null hypothesis was rejected. This means that the use of e-portfolio through Facebook in physics learning can increased students' creativity significantly.

Table 3. Results of the t-test on the post-test value

Dependent Variable	Df	T	P	Result	Hypothesis	Remark
Students' creativity in physics	29.00	5.396	0.00	Significant influence in means	H0	Reject

Table 4 shows the mean scores for dependent variables, standard deviations and results in physics post-tests for the groups before after the experiment. The means and standard deviation values of both groups were used to determine the effect size of treatment according to Cohen's method (Cohen, 1988).

Based on Cohen's method, if the value of d Cohen is greater than 0.25, it indicated a positive and significant level of learning influence. The Cohen value for the dependent variable (student creativity) in the creativity test in physics was 0.99965. This means that the influence of the e-portfolio through Facebook is sig-

nificant (Wolf, 1986). Thus, it can be concluded that the use of e-portfolio through Facebook can significantly increase student creativity in physics. Therefore, the hypothesis in this study was accepted and the null hypothesis was rejected because there was a positive and significant influence on the creativity of the students taught with the use of the e-portfolio through Facebook.

Table 4. Results of the t-test on post-test values

Dependent Variable	Pre-test Mean score	(N = 31) S.D	Post-test Mean score	(N = 31) S.D	Size Effect
Students' creativity in physics	8.08	25.301	11.295	59.335	0.99965

Discussion

The purpose of this study was to investigate whether the use of e-portfolio through the Facebook network can improve students' creativity in physics. Based on the results of data analysis, it was found that the use of e-portfolio through Facebook can improve students' creativity in physics. E-portfolios are digital collections of artifacts that represent individuals, groups, communities, organizations, or institutions. This collection can be placed on solid disc media (CD or DVD) or the web (Lorenzo & Ittelson, 2005). Furthermore, in the context of educational theory, this research continued the ideas of Usher & Edward (2003) and Walshaw (2007) to use Derrida (1997) and Foucault (1972) in education. They theoretically focus on the position of deconstruction in learning, by developing the subjectivity and individualism of student construction in modern times with technology. The presented research prioritizes findings that support the analysis of the results of student evaluation, and creativity depends not only on the originality and subjectivity of the students, but is also influenced by the student's relationship with the surrounding environment.

The findings of this study also show that there are student skills to produce modified creative works in physics. In addition, the understanding of the concept of the solar system in physics was also increasing. In addition, this study also shows that the students' attitudes and responses to learning processes were positive after using the e-portfolio through the Facebook network. Thus, the findings are a benefit of the research that done. This research has also produced an effective alternative way to improve students' creativity in physics with the use of e-portfo-

lio through Facebook, especially in the creation of creative and interesting posters and mind mapping. The result also shows a positive effect on low-achieving students, by improving the creativity aspect that increases the score of cognitive and psychomotor aspects and can increase the final score in the lesson that they followed. Furthermore, the most important result of the presented research was an e-portfolio through Facebook, allowing for improving students' HOTS skills in the creativity aspect so that the purpose of national education as stipulated in the Law of the Indonesian Republic Number 20, 2003, can be achieved. As a result of the research, the e-portfolio model through Facebook has been implemented by the physics lessons teachers in schools while teaching physics lessons. Thus, this learning system can help underachieving students to improve performance and enhance their final score.

Based on the above discussion, the authors agree that a learning model should be developed intensively in subsequent research with consideration of other learning components, such as the learning curriculum (Casagrand & Semsar, 2017), as well as learning theories and practices (Ganapathy, Singh, Kaur, & Kit, 2014). Thus, following the adapted approach of Drake and Brown (2003), HOTS development in the creativity aspect can be applied systematically to the education system.

Conclusion

The presented study investigated the effect of using an e-portfolio through Facebook in physics learning on the first-grade students (year 7) at Junior High School in Takengon, Central Aceh. The results of this study has empirically proved that e-portfolio-based learning through Facebook allows for improving students' creativity skills. Learning with a creative e-portfolio model through Facebook was one of the main factors in the positive improvement of students' creativity in physics. This study also shows a positive and significant influence of the use of e-portfolio through the Facebook network on students' creativity in physics.

Based on this, it can be concluded that a learning model should also be developed intensively in subsequent research. However, this idea should also be supported by other elements of educational institutions, such as educational curriculum, education system policies, teacher training, and student learning support programs. Given this, the HOTS in student creativity aspects can be further developed.

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