Effectiveness of Physics Learning Media Course assisted by Instagram on Student’s Creative Thinking Skill

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Abstract. This study aims to determine the effectiveness of Physics Learning Media course assisted by Instagram and to know its impact on students’ creative thinking skills. This study was conducted on students who took Physics Learning Media course. This research is a quasi-experimental with randomized pretest-posttest control group design. Independent sample t-test showed that the implementation of physics learning media course assisted by social media Instagram influenced students’ creative thinking skills. The ability to think creatively in students in the experimental class is higher than in students in the control class. These results indicate that Physics Learning Media course assisted by social media Instagram has an effective impact on students’ creative thinking skills.

Keywords: Learning media, Creative thinking skill, Instagram social media

1. Introduction

Facing the fourth industrial revolution era, education requires a lot of innovation and development, especially in learning process [1–4]. In this era, the development of technology and information is very fast [5–8]. Technological developments and information in the industrial revolution 4.0 causes education to require a lot of innovation and development, especially in learning. This era is known as the digital era, where access to learning becomes easier, faster, and cheaper, so, information is growing so rapidly [9, 10]. The main characteristic of learning in the digital age is the use of technological sophistication as the main base in the learning process [10, 11]. The learning paradigm begins to shift by no longer limiting interaction only in the classroom [13]. The process of interaction begins to move from the real to virtual. Learning also emphasizes the concept of learning that is innovative, skilled in using technology and information media, and able to work and survive by using its life skills [2, 3].

As an educational institution, university has an important role in responding to the paradigm shift. Higher education institutions are expected to be able to equip their students with skills so they can produce globally competitive graduates [3, 4]. Therefore, education process at University must be able to direct its students to be proficient in learning, creating and innovating, and proficient in using technology and information media. Nowadays, technology is more developed and easier to be adapted and utilized for learning purposes [17–19]. The task of educators, in this case is lecturers, is to strive for all forms of learning using information technology and media as its main base. Lecturers are
required to have more creativity in teaching, especially in choosing, designing, preparing and providing learning innovations [19, 20]. Lecturers’ creativity is needed to provide students with 21st century skills [21].

Based on the problems mentioned above, Physics Learning Media (PLM) course at Physics Education Study Program in UIN Raden Intan Lampung has started using learning by utilizing the development of information technology and media. In PLM learning, students are taught to understand the role, function and use of media in learning. Students are trained to be creative in making learning media to be used as a tool to introduce physics subject in schools.

PLM courses are basically intended to train students’ creative thinking skills. Creative thinking is the ability of individuals to look for ways, strategies and new ideas to get a solution to a problem [22–26]. In the learning process of PLM in the classroom, lecturers utilize technological sophistication such as the use of power points, videos, and demonstrations to foster student creativity.

However, based on the results of the evaluation of PLM courses at the end of the semester, it is found that the creative thinking ability of students who take PLM courses in 2017 is still not good. Students’ CTS test results are on average 38.48 from a scale of 100. In fact, the ability to think creatively must be owned by college students as prospective teachers in order to prepare themselves to enter the working world [27]. This was also expressed by the Career Center Maine Department of Labor USA which stated that Creative Thinking Skills are very important to have because this ability is one of the most important abilities and is highly needed in the working world [28]. Based on this, improvement in learning is needed to train students’ creative thinking skills to be better. This is certainly a homework for the lecturer to find a solution to this problem.

It must be recognized that one of the causes of the lack of students' creative thinking skills in PLM courses in 2017 is due to learning that is still offline. Therefore, one alternative solution that can be done is to utilize online learning combined with offline learning.

Online media is indeed developing very rapidly. The rapid development is influenced by the rising popularity of the use of social media [29]. Social media is a virtual community or network that allows users in it to interact with each other, build communities and share ideas and information [30]. Online social media assisted learning can be used as an alternative learning because of its nature which can be accessed anytime and anywhere [29].

Some popular social media include Facebook, Twitter, Instagram, WhatsApp, Line, and many others. These various social media have their own characteristics and advantages. One social media that can be used in learning is social media Instagram. Based on the results of a literature review on Instagram social media, it was found that this social media has several advantages and complete features to facilitate students' creative thinking [31]. Therefore, this research needs to investigate the effectiveness of using Instagram social media as a tool to improve students' creative thinking skills in PLM course.

2. Method
This research used quasi experiment method with randomized pretest-posttest control group design [32]. The research design is illustrated in table 1 below:

| Class     | Pre-Test | Treatment | Post-Test |
|-----------|----------|-----------|-----------|
| Experiment| O₁       | X₁        | O₂        |
| Control   | O₁       | X₂        | O₂        |

With:
O₁: Pretest to measure students’ creative thinking skills
O₂: Posttest to measure students’ creative thinking skills
X₁: Treatment with Instagram social media assisted learning
X₂: Treatment with learning without the help of Instagram social media
The population of this study were all students of Physics Education Study Program in UIN Raden Intan Lampung who took Physics Learning Media (PLM) course in even semester of the academic year 2017/2018. From the entire population, two groups were selected as samples using a cluster random sampling technique, then divided into the experimental class and the control class. This technique is used because the population is in a homogeneous condition and each class has the same average ability.

To find out the effectiveness of learning by assisting Instagram social media on students’ creative thinking skills, this study used tests, observations and questionnaires. The creative thinking skills tested was five indicators, those are fluent thinking skills, flexible thinking, original thinking, elaboration, and evaluation. The non-test instruments used include observation sheets to measure the success of Instagram social media assisted learning, documentation to analyze the level of students ‘creative thinking skills and questionnaire sheets to find out the scale of students’ attitudes towards Instagram social media assisted learning.

After CTS instrument was arranged, the instruments are then first tested. The trial results are then analyzed to know the characteristics of each item including validity, reliability, level of difficulty and discrimination power. After testing phase, the instrument was ready to be used in research to measure students' creative thinking skills.

3. Results and Discussion

3.1 Results

The results of the research showed data about students' creative thinking skills in physics learning media (PLM) courses with learning assisted by Instagram social media. Then the highest score ($X_{\text{max}}$) and lowest score ($X_{\text{min}}$) could be found in the experimental class and the control class. All the quantitative results of this research can be seen in Table 2.

| Class     | $X_{\text{max}}$ | $X_{\text{min}}$ | Central Tendency | Group Variance |
|-----------|------------------|------------------|------------------|----------------|
|           | $\bar{x}$        | $M_o$            | $M_e$            | $R$            | $S$          |
| Experiment| 100              | 40               | 81,3333          | 90             | 80           | 60          | 13,5927     |
| Control   | 75               | 10               | 42,6316          | 40             | 40           | 65          | 20,0948     |

Based on the results in Table 4.1 it can be seen that the experimental class obtained an average score ($\bar{x}$) that is greater than in the control class. And by looking at the maximum score obtained from the experimental class and the control class, it can be seen that the experimental class scores were way better than the control class. Based on these results it can be concluded that the creative thinking skill of students in the experimental class is better than the control class. Meanwhile, the results of the hypothesis test obtained by some data are shown in Table 3.

| Class     | $N$     | $\bar{x}$ | $Sp$ | $t_{\text{table}}$ | $t_{\text{count}}$ | Conclusion          |
|-----------|---------|-----------|------|---------------------|---------------------|---------------------|
| Experiment| 120     | 81,3333   | 14,61303 | 1,977431           | 2,480,519           | $H_0$ is rejected   |
| Control   | 19      | 42,6316   |       |                     |                     |                     |

Based on Table 3, we can see that $t_{\text{count}} > t_{\text{table}}$, so the null hypothesis ($H_0$) is rejected and alternative hypothesis ($H_a$) is accepted, so it can be concluded that the learning of physics learning media assisted by social media Instagram is declared effective in improving students' creative thinking skills.

3.2 Discussion

Creative thinking is the ability to see various kinds of possible solutions to a problem, and find the right way to solve a problem. The ability to solve a problem in the right way is very needed. Especially for prospective teachers, they are required to be able to think creatively. Moreover, high creativity is needed for teachers in presenting learning that can be accepted by their students.
Physics learning media is a course that prepares prospective teachers to be creative in presenting learning for their students in the future. Students are required to be able to design learning media so that they can plan for an effective and efficient learning process. One thing applied in this lecture is to train students to be creative in designing instructional media by utilizing modern technology using social media Instagram. By applying physics learning media courses assisted by social media Instagram is expected to be effective in training students' creative thinking skills.

Figure 1 shows some of the learning media products produced by students in the experimental class. Students then periodically upload the product twice a week for 2 months. Before designing media, students first have a discussion to determine the theme, prepare material to be posted and then make it. After posting, they monitored the responses by the number of likes and comments they got. If there are comments about the substance like questions related to the material posted, they are required to answer it properly. In figure 2 is an example of their discussion.

From the process of preparation to uploading material on Instagram trained some of their creative thinking abilities such as fluent, flexible, original, and elaborate thinking skills. This indicates that students' creative thinking skills can be trained through the use of this learning media.
Tables 2 and 3 show that creative thinking skills between students in experimental class and control class were different. Students in the experimental class have a better creative thinking skill. These results are also in line with the responses of students who learning PLM assisted by Instagram in their class, they strongly agree with the application of physics learning media assisted by social media Instagram, because with it, students are able to be more creative especially in designing physics and creative learning media and solving problems related to learning media. Overall, students’ responses are in the “good” category.

4. Conclusion
Based on this research, it can be concluded that physics learning media course assisted by social media Instagram are declared effective on students’ creative thinking skills. These results are also in line with the response of students who are declared “good” towards learning PLM course assisted by social media Instagram.

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