THE RESULTS OF STUDY CREATIVITY FROM LEARNING MANAGEMENT USING INFOGRAPHICS OF MATTAYOMSUKSA 6 STUDENTS

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ABSTRACT

Research on the study of creativity from learning management using infographics of Mathayomsuksa 6 students. The objectives were 1) to compare creativity scores before and after learning by using infographics 2) to study the influence of gender on creativity after learning by using infographics. The participant was 24 students in Mattayomsuksa 6 students who are studying in the first semester of the academic year 2022, consisting of 10 male students and 14 female students, taking 3 weeks to study. The tools used consisted of a learning management plan using infographics and creativity test. The results of the study showed that the average scores for creativity in two aspects were fluency and originality of students after learning by using infographic are higher than before leaning at a significant level .05. The scores of male and female students were not different in fluency and originality.

Keywords: infographic, creativity, gender

INTRODUCTION

Nowadays, teaching and learning in the 21st century focuses on four important skills: critical thinking, communication, collaboration, and creativity, as well as promoting the development of technology skills for learners to use as a tool in acquiring various knowledges. Arjkool (2019) Referring to Maytwin (2017) said that there are three main skills needed in the 21st century: 1) learning and innovation skills. 2) life and work skills. 3) Information skills media and technology. The teacher must have the basic knowledge that the learners must know Teachers also need to change from using lecture-based teaching methods to a student-centered learning management and change the content measurement method to the measurement of learners' performance. (Phornphisutthimas, 2013). This makes current learning outcomes more objective assessments. Aims for learners to create knowledge by themselves, learned from hands-on learning led to eagerness to explore Create a new paradigm instead of the old one to be used in real life. Learned from hands-on learning led to eagerness to explore learners can create a new paradigm instead of the old one to be used in real life.

Therefore, teaching and learning in the 21st century is the development of human beings to have a process of thinking, which is an important skill for real life. In developing learners in accordance with such skills teachers must prepare for learning management. Technology media must be used in conjunction with learning management, enabling learners to access information quickly and efficiently. Learners can use technology to search for information self-learning

(Kasititorn, 2021). This is different from teaching and learning in the past that caused learners to have no skills in applying knowledge to solve problems. Boonserm (2018) said that in the 21st century, science and technology are increasingly important in the development of the country. Especially developing students to be creative and able to create technology. Creative thinking skills are an important learning goal for students in the 21st century. Many workplaces need a creative and innovative workforce to enhance their economic or technical competitiveness. (Jantarakantee, 2016) Learning management in the classroom that allows learners to have a self-learning process should encourage learners to be creative since they were young.

The Civil Service Commission Office (2016) referred to the concept of Torrance (1971) that creativity is a phenomenon that occurs without limits. A person can be creative in many ways, and the results of creativity that occur there are many without limits. Guilford (1950) that creativity means multifunctional thinking or diffuse thinking divergent thinking, that is a multi-directional thinking led to the invention of something new including discovering ways to solve problems which includes initiative, fluency, flexibility and thoughtfulness. Trisnayanti, Khoiri, Miterianifa and Ayu (2019) accords to Coughlan (2007), creativity is not only useful for deepening the learning experience of learners. Creativity also helps to solve everyday problems and make decisions. Jantarakantee (2016) cited the research of Daud, et. al (2012) refers to the design of teaching activities to promote creativity that teaching students to be creative should start with teaching activities that demonstrate the creativity of the teachers first. Teachers should adjust their own teaching style from being a knowledge provider to being a model for designing new teaching activities, interesting for students to be creative. By designing teaching activities that promote creativity for students, one interesting way is teaching and learning using infographics, which Namwong (2017) said that developing students' creativity through the infographic design process Is a content and graphic design that goes through the process of thinking, analyzing, summarizing the importance and use creativity to transform information, news, knowledge, facts with concise, easy to understand content with an attractive design. That can convey content effectively this will encourage students to develop ideas and wisdom from direct experience making decisions and acting, which will lead to further development of creativity.

Learning management using infographics of Mathayomsuksa 6 students in the learning unit on the environment, therefore is one approach that helps learners understand the content. Thought process knowledge is integrated and develop creativity, which is an important skill in the 21st century. In this research, the researcher compared the level of basic creativity in the fluency component and initiatives before and after learning management and a comparative study of gender differences affecting creativity of Mathayomsuksa 6 students.

OBJECTIVES

1. Compare creativity before and after learning by using infographics of Mathayomsuksa 6 students.

2. Study the influence of gender on creativity after learning by using infographics of Mathayomsuksa 6 students.

RESEARCH AND METHODS

This research was conducted according to the one-group pretest-posttest design.

1. Population and sample:

The population in the study was Mathayomsuksa 6 students in the Mathematics-Science learning program, Demonstration School in Bangkok who are studying in the first semester of the academic year 2022, totaling 46 people. The sample group is 24 students, using a purposive sampling method.

2. Research tools: These research tools as follows:

2.1 Learning plans and learning activities using infographics about the environment, that have been quality checked by 3 experts in science teaching at the high school level.

2.2 Creativity skills test developed has been quality checked by 3 experts in science teaching at the high school level, It was developed from the Torrance Tests of Creative Thinking (TTCT) Figural Form A (Torrance, E. Paul.) into a test that consists of 2 sets of activities, each of which can measure creative in fluency and initiatives thinking. Create criteria for interpreting scores that define the framework for analyzing the quality of each component of creative skills. By using it to determine the score range and interpretation of each component of creativity as follows:

Measuring the creative components of fluency by using activities

- Activity set 1 from drawing in which the students add pictures from what is specified as a green triangle sticker into animal shapes in 10 minutes. Reacher collecting data by counting the number of pictures that learners add and writ the name.
- Activity set 2 adding pictures by let the learners add pictures from the lines given in various ways and write name the picture in a strange and interesting way in 10 minutes, collect the data by counting the number of pictures the learners draw, which must be unique or not the same thing.

Measuring the creativity component of initiative by using activities

- Set 2 of activities considered by counting the frequency of pictures that the learners drew, not repeating those of others and write the name of picture. The picture drawn must not be repeated from other learners.

DATA ANALYSIS

Score the two components of creativity before learning management which consists of fluency and initiative of each student according to the scoring criteria by the investigator triangulation method. Experts joining in to analyze and interpret students' answers to verify the correctness of the interpretation of the data. Analyze and compare the number of students and the percentage of total students in each level of the pre-learning and post-learning creative components. Analyze the average score, percentage and standard deviation of each creative element. Then compare the average scores for each creative aspect of the pre-test and post-test were significantly different by using a paired t-test.

RESULTS

1. The results of analyzing the mean scores for each component of creativity before learning with infographics. It was found that the fluency and initiatives had an average score of 8.08 and 3.54, respectively.

When analyzing the number of students at each creative element, it is found that the fluency and initiative scores of most students are 18 and 13, respectively.

2. After teaching with infographics, the mean scores for each component of creativity in fluency and initiative were found. with an average score of 17.00 and 8.79, respectively. When analyzing the results, we found that the students' fluency and initiative scored very high.

3. Comparative analysis results of the average scores before and after learning in each component of creativity. It was found that in the aspect of fluency, the average score after learning was higher than before learning ($\bar{x}_{\text{after}} = 17.00 > \bar{x}_{\text{before}} = 8.08$). In terms of initiative, the average score after learning was higher than before learning ($\bar{x}_{\text{after}} = 8.79 > \bar{x}_{\text{before}} = 3.54$) at .05 level of significant. (Table 1)

Table 1: The analytical results compared the mean scores of creativities before and after learning with infographic-based learning management.

Creative Element Score	Full score	$\bar{x}$	S.D.	t	Sig.
Fluency (n=24) Before learning	20	8.08	2.54	16.68	.00**
After management		17.00	1.50		
Initiative (n=24) Before learning	10	3.54	0.98	16.71	.00**
After learning		8.79	1.02		

**significance level at .05

4. The results of analyzing the average scores in each element of creativity after learning using infographics revealed that the fluency of male students and female students had an average score of 17.20 and 16.86, respectively. In terms of initiative, the average scores of male students and female students were 0.84 and 1.07, respectively. The results showed that there is no difference between the two creative elements of male students and female students. (Table 2)

Table 2: The analytical results compared the mean scores of the post-learning creativity scores of male and female students using infographic-based learning.

Creative Element Score	$\bar{x}$	S.D.	t	Sig.
Fluency (n=24) Male (n=10)	17.20	1.40	0.54	0.59**
Female (n=14)	16.86	1.61		
Initiative (n=24) Male (n=10)	0.84	0.27	1.65	0.11**
Female (n=14)	1.07	0.29		

**significance level at .05

CONCLUSIONS

1. A study of scores in each component of creativity of Mathayomsuksa 6 students before learning management using infographics that consists of 2 aspects, fluency, and initiative. It was found that in both aspects, the average creativity score of most students is medium. When they were learning management for a period of 3 weeks in the learning unit environment. It was found that in each creative component the students' average scores in each component were higher than before learning.

2. The study compared the mean scores of male students and female students in each component of creativity after learning management using infographics. It was found that the creative scores of fluencies and initiative of male students and female students were not different.

DISCUSSION

1. Scores for each component of creativity of Mathayomsuksa 6 students in the current state. It was found that the students were creative in fluently and initiative are moderate. As a result, students had average scores for creativity. This is caused by the current teaching and learning management that does not encourage students to be creativity. According to the research of Rattanakorn and Kaewkhongkha (2021) a study of creativity from inquiry-based learning with infographic. They found that most of the students' creativity was low and medium level before learning. When learning and investigating with information graphics, found that the average creativity score of students after learning is higher than that before. Namwong (2017) who said that teaching and learning at present, most teachers still use the traditional teaching method that is teacher centered. The teacher will act as a guideline for teaching and learning all activities. Emphasis on content-based lectures for learners to remember. When students express their opinions, they are limited to the answers that the teacher wants. As a result, students lack creativity.

2. A study of learning management using infographics. It was found that students had an average score in each element of creativity after learning was higher than before learning. All students had the level of creativity is high. It shows that learning management using infographics developed by the researcher can increase students' creativity. Because it is a learning management method that allows learners to seek knowledge and study on their own. There is an integration of knowledge that promotes thinking processes and imagination to design works that lead to creativity. Encourage students to develop their own knowledge and creativity. Namwong (2017) that found that developing students' creativity through the design process with infographics will help students to plan systematically, can think creatively in the production of work pieces, and help students to be creative. Saurbier (2014), which examined the effect of using infographics to study higher thinking skills of undergraduate students. The results of the study showed that learners who were taught using infographics had higher learning abilities and creativity. Davidson (2014), Naparin and Saad (2017) Said that the use of infographics in learning management not only results in creative thinking among students. It also results in the students having an analytical thinking process, data interpretation, relevant

information and help students learn faster. Because infographics are teaching aids with interesting images and colors. There for able to transfer knowledge to students quickly.

3. The study compared the mean scores of male students and female students in each component of creativity after learning management using infographics. It was found that the creative scores on fluency and initiative of male students and female students were not different, consistent with the research of Suejanta (2021) who compared the differences in creativity. Creativity classified by gender of students, faculty of Information and Communication Technology Silpakorn University. It was found that students of different genders had no difference in creativity. This may be because creativity is a behavior that manifests itself from within a person thoughts, imagination, and experience systematic.

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