



Research Article

The Influence of Creative Learning Assisted by Instagram to Improve Middle School Students' Learning Outcomes of Graphic Design Subject

Mohammad SALEHUDIN¹, Nyoman Sudana DEGENG², SULTHONI³,
Saida ULFA⁴

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Abstract

This paper aims to assess the comparison of conceptual application learning outcomes of graphic design subject between class with creative learning assisted by social media Instagram and class with problem-based learning without social media Instagram. This research employed semi-experimental approach with non equivalent control group design. It took 144 students of vocational high school divided into four classes (two experimental classes with 72 students and two control classes with 72 students). The experimental classes were taught by creative learning strategy assisted by Instagram and the control classes were taught by problem-based learning. The results explain that learning outcomes of students learnt by creative learning assisted by Instagram are higher than students learnt by problem-based learning. The formulated hypotheses were accepted since it resulted a significant mean between the experimental classes and the control classes.

Keywords: Creative learning, social media Instagram, graphic design, concept application learning outcomes.

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¹ IAIN Samarinda, Orcid no: 0000-0002-0279-9819

² Professor, Department of Instructional Technology, Faculty of Education, Universitas Negeri Malang, Indonesia, (nyoman.sudana.d.fip@um.ac.id)

³ Doctor, Department of Instructional Technology, Universitas Negeri Malang, Indonesia (sultoni.fip@um.ac.id)

⁴ Doctor, Department of Instructional Technology, Universitas Negeri Malang, Indonesia (saida.ulfa.fip@um.ac.id)

Introduction

Today, in the 21st era of learning, creativity is one of the important skill and must be highly prioritized as a response of current changing and to prepare children to be able to adapt with the changing. Newton & Newton, (2014) mention that creativity is the solution to global issues. Creativity can be stimulated through collaboration in the context of global education—collaboration is regarded more profound compare to competition. Teacher, hence, is encouraged to promote collaboration activities by doing creative learning, discussion, or inventing a product of using technology for the learning. Such activities would enhance children ability to work in a team and maximize creative potential they have explored by instructional technology (Henriksen, Mishra, & Fisser, 2016).

Creativity allows individual to communicate with a new concept (Mel Rhodes, 1961) for learning in school and classroom which is developed as creative learning concept, the concept is then applied with the support of curriculum (Beghetto dan Potter, 2016;4;;Protosaltis et al., 2010;Davies et al., 2013).Creative learning curriculum has been implemented in the context of American education (Baer, 2003) and it resulted positively, even in the other countries other than United State of America. Teacher of music course also implements creative learning (Brinkman, 2010) as well as fine arts teacher (music and visual arts) (Ellis, 2016).

Numerous research have been conducted on creative learning (Daniel, 2001), creative learning is a brand-new approach which regards and facilitates individual to become creative human being (Cheng, 2016,Beghetto and Potter, 2016;3), assiste students to express ideas and feelings (Beetlestone, 2013;28), takes into account emotional responses and aesthetics (Beghetto & Potter, 2016), serves as social modelling, strengthening, and class ecology (Soh, 2017), as well as improves spatial ability and visual cognitive style (Ji Young Cho 2016). Creative learning is directed to improve creative ability in children and adolescents (Davies et al., 2013;Eckhoff, 2011).

In the creative learning, creative individual and academic achievement positively correlate (Gajda, Beghetto, & Karwowski, 2017a), primarily students' achivement in the context of cognitive ability. To realize the aforementioned goal, it is imporatatn to implement creative learning model (Beghetto & Potter, 2016) such as TASC to teach and develop creativity of gifted students (Alhusaini, 2018), Creative Learning Principle (CLP) to solve problem creatively (Ellis, 2016; Horng, dkk, 2005). Yet, ut should note that creative learning focuses on student personality and the interaction between student and teacher, physical control and sources availability (Soh, 2017;Cheng, 2016;Beghetto & Kaufman, 2014; Aljarrah, 2017;Richardson & Mishra, 2017). The instagram assisted creative learning model used is the model of Creative Learning Principel (CLPs) includes stages of: Lesson opening (Teacher facilitated), Lesson (Student centered), Lesson closing (Sumative evaluation). Syntax steps with the series of *recall, acquisition, apply/practice, think and plan, produce/create*

evaluation/analysis, present, critique, and re-create. Consider the following model of CLPs on the figure:

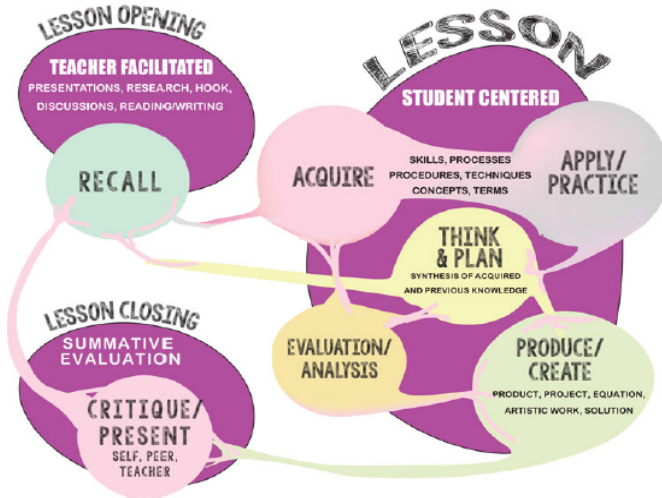


Figure 1.

Model of Creative Learning Principle (source: Ellis, 2016)

Sadly, middle and secondary schools in Indonesia have not implemented creative learning as the primary approach yet. Although creative learning is included in the curriculum, it is not specifically implemented to achieve learning goal, creative personality realization, academic achievement which based on the current context; some obstacles are found indeed (Tanggaard, 2011). Creative learning should be developed and implemented for several learning context, for instance: planning and presentation of artwork (Watson, 2014), short video collaboration (Toyn, 2008), cooperation with professional visual artist in school Heath & Wolf, 2005), providing choices, accepting different ideas, enhancing confidence, focusing on students' interest (Fleith, 2010), as well as creating a delightful space for creative learning interaction (Robinson & Kakela, 2012). Some of these forms of creative learning are examples and should be applicable to creative learning in Indonesia, although the task for teachers and practitioners to find and carry out creative learning that involves all or most of this advice seems overwhelming.

The development of web technology is available and an abundant resources. Moreover, the development of social media as a global network channels rapid, including in Indonesia which becomes the biggest user of mobile technology. In addition to accelerating access to its use, Besides speeding up access to its use, mobile technology can be used as a solution to several obstacles in learning, especially in the formation of creative personalities (Cochrane & Antonczak, 2015), (Turvey, 2012), although collaboratively can be formed naturally through the use of social media,

adopted the mobile social media for learning (Ogbonnaya, 2019) served as the platforms of teaching and learning (Hashim, Rashid, & Atalla, 2018) offered as the part of the new education system (used for distance education) (Varol & Dhyab, 2018), learning used the mobile and social media available in full and more advanced in accordance with the shape and purpose of the social media, such as facebook, twitter, instagram, youtube, whatapp and so on (Mohamed AbdelFattah, Galal, Hassan, Elzanfaly, & Tallent, 2017), (Liu, 2010).

Instagram, a social media allowing its users to share photo and videos, supports a learning process in the creative learning. Primarily, Instagram is highly popular among students and they are familiar in operating Instagram since they have their own device. Instagram is very popular among students since it allows students to share images and short videos which are more interesting than other kind of social media—social media which allows the users to tweet, microblog, share status and so on (Manampiring, 2015).

According to Masters (2013), in the context of new learning, mobile technology can be used for novice learners. It further strengthens by Yang and Hsu (2015) who explain that social media in learning has a pedagogical supports. The major argument for this notion is social media offers the users various types of format, direction, and communication channels which contributes to learning outcomes. Instagram has advantages in the independence of visual images like photos, and short videos with creative designs (Hu, 2014; Manovich, 2016; Shaw, 2016). Interestingly, on Instagram, there is a visual content that is produced from a computer graphic design that has its own advantages.

In graphic design, imagination is the key point and serves as element to produce brand-new, original, and great artwork. Shared photos in Instagram encourages individual imagination of graphic design (Lee, Alifah, & Abu, 2015). Essentially, graphic design course has generat standards as follows: standard of color picking, text printing, illustration and photo, cartoon, video clip using, and vocal sound, sound effect, adn music utilization (Ahmad Aldalalah & Waleed Mohamed Ababneh, 2015). Thus, creative learning is appropriate for graphic design course if it is also assisted by Instagram since it allows a development of brain parts which correlate with cognitive aspect, maximizes learning process (Brierley, 1984), allows individual to communicate with a new concept (Mel Rhodes, 1961), supports students when they are fail by showing what needs to be improved from their mistakes (Gajda, Beghetto, & Karwowski, 2017b), supports students creativity in the context of complex classroom environment (Eckhoff, 2011) and eventually increases students' learnin outcomes through creative learning (Tanggaard, 2014).

According to Stuart (1974), graphic design concept pays attention to cognitive and affective aspects, particularly when it is connected with withdrawal of information and attitude towards the presentation. When referring to the taxonomy

principle of Bloom revised by Lorin Anderson Krathwohl, that there are six levels of cognitive ability: the lowest is remembering and understanding, while the higher level involves applying, analyzing, evaluating, and creating. The learning outcomes of the application of concepts located in the cognitive realm (demonstrating, drawing pictures, using, digging and manipulating), students are guided to have the ability to select or choose appropriate applications in new situations and apply them correctly—this category is closely related to procedural knowledge (Krathwohl, 2002; Lorin, W. Anderson & David, n.d.).

Students in learning basic graphic design in class ten (X) have several problems, namely how students find and develop ideas and ideas and imagination. And how students complete learning with learning strategies and fun learning resources according to students' interests and needs and learning outcomes. Students need self confidence, develop potential ideas and learning resources from mobile technology assisted by social media Instagram. With the above problem interesting to do research, graphic design learning uses creative learning strategies assisted by social media Instagram which aims to test the comparison of learning outcomes of the application of the basic subjects of graphic design in the experimental group and the control group.

Method

Hypothesis of Study

The objective statement is based on the null hypothesis or the statistical hypothesis on the independent sample t-test. In this study, it compared the average of two groups that were not interconnected with each other (Mertens, Pugliese, & Recker, 2017). This statistical test attempted to measure the research hypothesis as follows:

H₀ = there is no difference in the average student learning outcomes between the experimental class and the control class

H₁ = there is difference in the average student learning outcomes between the experimental class and the control class

The basis for decision making in the independent sample t test is as follows:

1. If the Sig. (2-tailed) > 0.05 then H₀ is accepted and H₁ is rejected; which means there is no difference in the average student learning outcomes between the experimental class group and the control class group.
2. If the Sig. (2-tailed) < 0.05 then H₀ is rejected and H₁ is accepted; which means that there are differences in the average student learning outcomes between the experimental class group and the control class group.

This hypothesis supported by the social media of instagram assisted creative learning in the context of a new learning using mobile technology, especially for beginner students (Masters, 2013) introducing the creative learning model and the application of the creative learning model in the class (Beghetto & Potter, 2016) creative learning has characteristics of: relevance, control, ownership and innovation

(Jeffrey & Woods, 2009) has concluded that the higher the relevance of teaching to life, world, culture, and children’s interests, the more likely that students will have control over their own learning process. The relevance helps the identification, motivation, happiness and enthusiasm. Control, in turn, leads to the knowledge produced. Thus the hypothesis submitted to find the research result.

Research Design

The design of this study was a quasi experimental non equivalent control group. Samples were obtained not randomly but by looking at equality between the control and experimental groups. The sample in this study were students of Vocational High School (IT) Information Technology at SMKN 7 Samarinda 7 Indonesia.

Participants

Participants in the study consisted of four classes consisting of 144 participants, 2 classes made into the experimental class group and 2 classes as the control class group (36 participants each class). Participants in this study were tenth graders students in the second semester of the Information Technology Vocational High School (SMK IT Negeri) 7 Samarinda. The participants age were between 14-15 years. The participants were students of the Department of Multimedia (MM) and Department of Network Computer Engineering (TKJ). All participants fulfilled the attendance and assessment requirements, took pre-test and post-test. Participants data is seen in the following table:

Table 1.

Sample Description Based on Class and Gender

Class	Gender	N
Experimental	Male	31
	Female	41
	Total	72
Control	Male	28
	Female	44
	Total	72
Total	Male	59
	Female	85
	Total	144
Age		14-15years

Data Collection

The initial test scale measuring student learning outcomes was applied to identify initial abilities in determining the research sample (pretest). After the pretest data was processed, it was divided into two groups; the control group which used problem based learning and the experimental group used creative learning models assisted by social media Instagram. Therefore, in this study it is necessary to conduct and experiment using the control and experimental classes.

Table 2.

Experimental procedure

		Meetings							
		1	2	3	4	5	6	7	8
Class	O1					<i>Experimental</i>			O2
	O1					<i>Control</i>			O2

Annotation:

O1= Effective teaching behaviour (pretest) measurement

O2 = Effective teaching behavior (posttest) measurement

Data Collection Tools

A measurement scale consisting of 12 items was used to answer this research problem. The items were generated from a review of questions about the basic competencies, indicators and lesson content. As for the application test concept, it employed a description test amounted to 12 questions. A perfect answer is given a score of 8.3, an incomplete answer is given a score of 4 and no answer at all is given a score of 0, thus the highest score for the description problem is 8.3 and the lowest is 0. The total score was then multiplied by 12 thus the maximum score achieved is 100 and the lowest score is 0. Table 5 below explains the concept application items blueprint.

Tabel 3.

Concept Application Items Blueprint

Basic Competences	Code
• Applying bitmap image processing software (raster)	1, 2
• Implementing bitmap image processing software (raster)	3, 4
• Applying raster graphic manipulation using effect features	5, 6, 12
• Manipulating raster graphic by using effect features	8, 9
• Applying bitmap-based design (raster)	7,10
• Making bitmap-based design (raster)	11

Data Analysis

This research was a quantitative study with a descriptive approach (average and standard deviation). Validity and reliability have been analyzed and reviewed by different experts. The data analysis used independent sample t-test to identify differences in the average value of student learning outcomes between the experimental and the control class. The results of the research data recap were analyzed using SPSS 24.0 with a statistical significance value of 0.05. Before the t test was carried out, it had passed the normality test stage with the Ka Kolmogorov-Smirnov test and the data homogeneity test stage was used the Levene Quality Test.

Results

The learning outcomes of the concept application are an ability or an objective that has been achieved or possessed by students after learning. In this study, it intended to identify students' learning outcomes of basic graphic design after the learning process, both those learned by using creative learning strategies assisted by social media Instagram and those who were taught with problem based learning strategies.

The pretest average score of the experimental group was 70.82 with a standard deviation of 7.88. While the average score of the control group pretest was 70.71 with a standard deviation of 7.88. The two are not different, meaning that the two groups of subjects were homogeneous. Then, after the treatments were given, the posttest average score of the experimental group was 84.39 with a standard deviation of 4.75 while the average score of the control group was 84.07 with a standard deviation of 4.26.

Table 4.

The Results of the Average Value of Pre-test and Post-test Pretest and Posttest Average Score

	Mean	Standard Deviation
<i>Experimental Class Pretest</i>	70,82	7,88
<i>Control Class Pretest</i>	70,71	7,88
<i>Experimental Class Posttest</i>	84,39	4,75
<i>Control Class Posttest</i>	84,07	4,26

Normality Test

Data normality test was a test of assumptions conducted to determine the normality or symmetry of the distribution of research data obtained. Data normality testing was done by the Kolmogorov Smirnov and Shapiro-Wilk goodness of fit test on the observed variables. The results of normality test data are presented in the following table.

Table 5.

Data Normality Testing Using Kolmogorov-smirnov Tests

Class	Kolmogorov-Smirnov^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Experimental Class Pretest	.075	72	.200*	.970	72	.087
Control Class Pretest	.079	72	.200*	.971	72	.095
Experimental Class Posttest	.081	72	.200*	.982	72	.408
Control Class Posttest	.074	72	.200*	.986	72	.618

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The normality test results of the research data as presented in table 5 above show that the significance number in Kolmogorov-Smirnov for the pretest experimental

class was 0.200 and the posttest experiment was 0.200 while the pretest control class was 0.200 and the posttest control was 0.200. The significance of Shapiro-Wilk for the experimental pretest class was 0.087 and the experimental posttest was 0.408 while the pretest control class was 0.095 and the posttest control was 0.618. In other words, the significance value of each data is greater than 0.05, thus it can be stated that the research data was normally distributed.

Homogeneity Test

Homogeneity tests were carried out on two classes, the experimental class and the control class using Levene's test for homogeneity variances.

Table 6.
Test of Homogeneity of Variance

	Levene Statistic	df1	df2	Sig.
Pretest	.007	1	142	.931
Posttest	.514	1	142	.474

Based on the data presented in table 6. above it is known that the sign value. (p-value) from the Levene test for the pretest and posttest were respectively 0.931 and 0.419 (Sign p-value > 0.05). Hence, it can be concluded that the variety of learning outcomes data both pretest and post test were homogeneous.

Hypothesis Testing

Hypothesis testing in this study was conducted using the independent samples t-test in order to determine the difference between the differences before and after treatment in each group, namely the experimental and the control group.

Table 7.
Independent Samples T-Test Results

Levene's Test for Equality of Variances				t-test for Equality of Means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	
Post test	Equal variances assumed	.514	.474	5.064	142	.000	3.944	.779
	Equal variances not assumed			5.064	140.371	.000	3.944	.779

Based on the test results the value of the Levene Test as presented in table 7 above, it shows that the classes were homogeneous. Therefore, the results of the independent sample test on the posttest value of the experimental and control classes were used in the first line (equal variances assumed), that is, the Sig. Levene's Test for Equality of Variance was $0.474 > 0.05$, thus it can be interpreted that the data variance between the experimental and control groups was homogeneous or similar. Then, the interpretation of the Independent Samples Test output table above was based on the values contained in the "equal variances assumed" table. Based on the Independent Samples Test output table in the equal variances assumed section, the Sig. (2-tailed) of $0,000 < 0.05$ then as the basis for decision making in the independent sample t test, it can be concluded that H_0 is rejected and H_1 is accepted. Thus, it can be concluded that there are significant (real) differences of learning outcomes between experimental group students learning with the creative learning assisted by social media Instagram and the control group students learning with problem-based approach.

If Problem Based Learning (PBL) is a real problem as a context for students learning critical thinking and problem solving skills, and gaining knowledge, then the creative learning is an ability to direct students to cultivate their potential, expression of ideas and feeling, paying attention to emotional and aesthetic responses. As well as giving students' choices, accepting different ideas, increasing self-confidence, and focusing on students' strengths and interests. The advantages of instagram assisted creative learning can provide good learning outcomes, instagram social media triggers the power of imagination in learning graphic design and optimizing the potential of ideas and graphic design ideas of the students.

Then, by looking at the p-value (Sign. 2-Tailed) in table 7. above, it is known that the P-Value (Sign. 2-Tailed) value is $0,000 < 0.05$. Therefore, the difference is significant at probability 0.05. The magnitude of the difference in the average value as shown in the mean difference column of 3,944 which means that the experimental group has an average value higher than the control group. Thus, it can be concluded that creative learning assisted by social media Instagram applied to the experimental group is more effective than the problem-based learning model applied to the control group—seen from the acquisition of cognitive learning outcomes of students.

Analyzing the use of instagram social media in graphic design learning, we used the instrument form User Experience Questionnaire (UEQ) online and open question related to the user experience of instagram for graphic design learning. The instrument is in Indonesian version, because there are several language versions of the questionnaire built and validated (for example, English Spanish, Portuguese, etc). These versions are available for free at www.ueq-online.org. The six elements or scales are as follows: *Daya Tarik, Kejelasan, Efisiensi, Ketepatan, Stimulasi, dan Kebaruan*.

The instagram evaluation result for learning graphic design thus can be better interpreted.

Table 8.
Results of Mean and Comparison to Benchmark of UEQ

Scale	Mean	Comparison to benchmark
Attractiveness	1,81	Excellent
Perspicuity	1,53	Above Average
Efficiency	2,00	Excellent
Dependability	1,75	Excellent
Stimulation	1,94	Excellent
Novelty	1,33	Good

Based on the diagram of the benchmark result of UEQ, there are four scales categorized, they are Attractiveness, Efficiency, Dependability and Stimulation, whereas the scale of Perspicuity categorized as Above Average and Novelty categorized as Good in accordance with the benchmark interval of UEQ that has been determined. The following is to find out the benchmarks of calculation results of UEQ, can be seen in table 3:

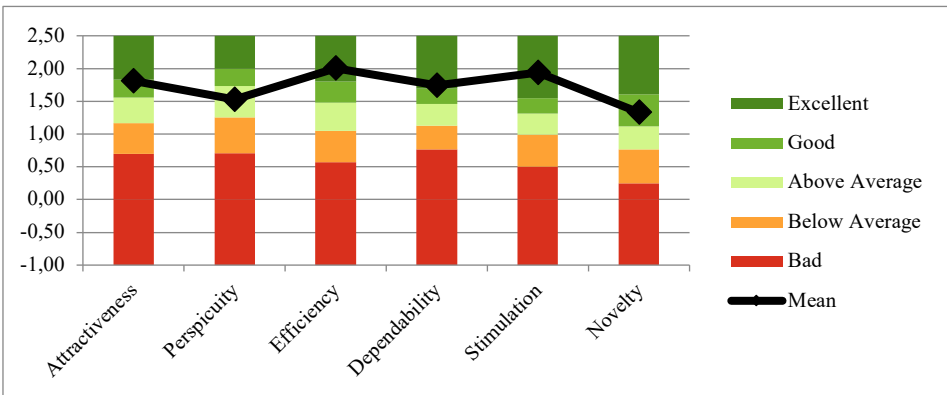


Figure 2.
Results on UEQ Benchmarks

It shows the graphic of mean scores of the questions according to the group. The mean scores of impression between -0.8 and 0.8 are normal evaluation score, scores > 0,8 are positive evaluation and scores <-0,8 are negative evaluation. So it can be concluded that the social media application of instagram for graphic design learning tends to have positive impression (scores at the direction of 1 and above) successively decreases in the groups of efficiency, attractiveness, dependability, perspicuity, stimulation and novelty.

Discussion and Conclusion

Based on the results of calculations and data analysis from this quasi-experimental study, it shows that the average learning outcomes in the experimental class that used creative learning assisted by social media Instagram is higher than the control class that used problem-based learning. Creative learning assisted by social media Instagram for graphic design subject promotes a real effect in the development of concept application learning outcomes for students of Class ten (X).

The pre-test and post-test results of normality data show that the scores were not far from the average value and standard deviation, a small difference adrift (see table 5). But, from the results of hypothesis testing using the Independent Sample Test there are high differences, H_0 is rejected and H_1 is accepted or there is a significant difference from the two groups of experimental and control classes. The achievement of high learning outcomes is due to several factors, according to the researchers' observations, they are the suitability of graphic design learning process using technology, easy-to-use social media Instagram, the presence of the principles of creative learning, and the exploration of student potential. First, graphic design lessons are incorporating the field of cognitive science into instructional technology thus the effectiveness of graphic design can be optimized (ChanLin, nd) Second, easy-to-operate social media called Instagram for graphic design subject promotes convenient and delightful learning, thus it affects the value of concept application learning outcomes of student in the cognitive realm (Krathwohl, 2002). Third, creative learning principles guides daily lessons with the aim of gaining deep-rooted knowledge through creative processes while solving standards-based problems. Creative solutions are associated with knowledge that was previously known/understood, identified, newly acquired, applied before, newly applied, practiced, planned, compared, contrasted, made/produced, assessed/evaluated, presented and remade (Ellis, 2016). Fourth, through creative learning assisted by social media Instagram students can explore their imagination, creativity, skills and presentation of their graphic design work, as investigative and inquisitive individuals who have the ability to think critically and creatively (Çildir, 2017).

This study supports Watson's (2014) statement that students are more motivated and involved when they have access to alternative learning approach, creative assessment opportunities that involve experimentation and risk taking in a supportive learning environment. As well as the views of Jennifer Masters (2013) who explains that learning needs a creative strategy considering the use of mobile technology, especially for novice students. The most critical feature directly shaped by attachment is self-concept (Kartel & Tortop, 2019) Instagram social media promotes to strengthen creative learning. This social media is one of the most popular social networks around the world (Statista, nd). Instagram has advantages that can be used as learning tools (Osgerby & Rush, 2015). Instagram is used for

museum promotion. The users have the opportunity to communicate their experiences through the choice of subject photos and the way they choose to manipulate and present them (Weilenmann & Hillman, 2013). It is suitable for students who like to draw images (Pittman & Reich, 2016). In general, students show positive attitudes and beliefs about the use of social media in education (Mao, 2014) favored by the younger generation for comparative study of characteristics (Jang, Han, Shih, & Lee, 2015). Findings by Yang & Hsu (2015) report a pedagogical support for the use of social media in teaching, is that teaching tools are presented in accordance with individual differences (Tortop, 2016). The main argument for adopting social media in teaching is that social media applications provide several formats, directions and communication channels, which is able to improve learning outcomes.

High hypothesis test results is supported by the creative learning assisted by social media Instagram. The learning process allows a meaningful and authentic learning experiences. This facilitates the development of creative problem solving, critical thinking skills, offers opportunities for students to explore, understand and appreciate themselves, and directly contribute to their community (Mayesky, 2002). Instagram is a stimulant towards potential talents and interests and attention to the characteristics of creative learning; relevance, control, ownership and innovation. (Jeffrey & Woods, 2009) have concluded that the higher the relevance of teaching to the real-life, culture, and interests of students, the more likely that students will have control over their own learning processes. Relevance promotes identification, motivation, excitement and enthusiasm. Control, in turn, leads to ownership of the knowledge produced. Future internal factors need to be considered such as student characteristics, potential, passion, talent, and interests (Zakaria, Setyosari, Sulton, & Kuswandi, 2019).

This paper recommends and suggests the teachers of graphic design subject to be able to apply creative learning strategy assisted by social media Instagram. Furthermore, the school principal should fully accommodate and support the effort in implementing the creative learning strategy in the classroom.

Based on the pre-test and post-test, the scores margin are not far adrift, while the average scores and standard deviations are small adrift. A small range of average scores can be seen between the pre-test of experimental and control classes as well as the post-test of experimental and control classes.

However, the results of the hypothesis test states that H_0 is rejected and H_1 is accepted. This concludes that there is a significant difference between student learning outcomes in the experimental group which applied a creative learning assisted by social media Instagram. This findings were supported by several factors according to the observations of researchers. Thus, the cognitive majors of multimedia students who were taught with creative learning assisted by social media

Instagram have high average learning outcomes. The cognitive domain in (C3) is a higher than the control class that applied problem-based learning in basic graphic design subjects. Although it tends to require a long process, the teacher's role is important for the balanced learning process, the teacher guides, helps, invites students to make learning more creative, fun, experience-based, experimental-based, and inspiring.

The recommendations of this study were conveyed to graphic design teachers to be able to use creative learning models assisted by social media Instagram. To the principal to give full support to efforts to improve and implement creative learning in the classroom and at school.

Further research needs to be done regarding the application of creative learning in more specific abilities for students in other subjects, and the addition of internal factors such as student and external characteristics such as school curriculum support, school regulations regarding the provisions of carrying a smartphone, adequate internet availability, educational background, family, etc. The next research needs to be done as a part that can be utilized in effective, efficient, and attractive learning.

Yet, a further research regarding the implementation of creative learning in the varied learning context (specifically to the other subjects) must be conducted. It is important to take into account an extended internal and external factors such as student's characteristics, school curriculum support, internet availability, educational background, family context, and so on. Further research could be conducted as a part in utilizing an effective, efficient, and interested learning.

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Biodata of the Author



Mohammad Salehudin was born in Susuk, East Kutai, Indonesia. He graduated from the Department of Islamic Education, Faculty of Tarbiyah, IAIN Samarinda in 2002. Active in Graphic Design since 2004 as a Designer and consultant. He completed his master's degree in Technology Education, Mulawarman University in 2006. Worked as a Media and Technology Education lecturer at IAIN Samarinda, East

Kalimantan, Indonesia. And then he is now completing his doctoral education in Learning Technology at the Faculty of Education, State University of Malang

Affiliation: IAIN Samarinda **E-mail:** salehudin@iain-samarinda.ac.id – msh75@gmail.com **Orcid number:** 0000-0002-0279-9819

Phone: (+62)8125393426



Prof. Dr. I Nyoman Sudana Degeng, M.Pd, was born in Klungkung, 23 September 1958. is a professor in the post Graduate program of the Department of Education and Technology, Universitas Negeri Malang, Malang, Indonesia. His research interests include research methodologies, evaluation and assessment, Instructional Technology, Educational Technology, Learning Technology, Education.

Affiliation: Universitas Negeri Malang **E-mail:** nyoman.sudana.d.fip@um.ac.id



Dr. Sulthoni, M.Pd was born in Mojokerto, 29 January 1958. Sulthoni is a lecturer in the Department of Educational Technology, Universitas Negeri Malang, Malang, Indonesia. His research interests include instructional media and learning strategies.

Affiliation: Universitas Negeri Malang

E-mail: tonikueren@ymail.com, sultoni.fip@um.ac.id



Saida Ulfa, S.T., M.Edu., Ph.D was born in Makasar, 10 September 1979 is a lecturer in the Department of Educational Technology, Universitas Negeri Malang, Malang, Indonesia. Her research interests include mobile learning, instructional media, and learning engineering.

Affiliation: Universitas Negeri Malang

E-mail: saida.ulfa.fip@um.ac.id

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