

Instagram User Experience in Learning Graphic Design

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Abstract—Mobile phone technology offers new opportunities to integrate face-to-face learning also other models of learning. Instagram is mostly only used for business and public figure exposure. But we see a tendency to use Instagram that students use in learning graphic design as a way to access content, publish work and learning outcomes using mobile phone. The purpose of this study is to find out the comparison of the average value of In-diagram assisted creative learning and measure the user experience (UX) of Instagram in learning graphic design. This study uses a quantitative approach with a pseudo experiment of non equivalent control group de-sign to find a comparison of the average value of student learning outcomes in the Statistical Test with MANOVA and to find out the average value of UX with UEQ Instagram benchmarks for learning graphic design. The results of the study there are significant differences (real) the average value between the experimental class group and the control class group. UX test results are on four scales that are categorized as ex-excellent, namely the scale of Attractiveness, efficiency, dependability, stimulation. One perspicuity scale is above average, and the novelty scale is good, the mean range is 1.33-2.00 according to the UEQ benchmark interval. The implication of this research is that Instagram through mobile phone technology is effectively used for the creative learning of graphic design lessons and needs to be developed as a medium for the development of teaching materials on all subject matter.

Keywords—User experience, Instagram social media, graphic design

1 Introduction

The development of mobile phone technology in the 21st century is growing rapidly, indicated by all human activities at this time, no exception for education and learning which is known m-learning. Various uses of mobile phone technology for education and learning both at the school to college level, from novice students. [1] up to college student [2], the use of which includes uses for learning activities [3] used by the administrative staff [4] used to encourage the emergence of smart classes with efficient technology [5]. There is no gender difference in the use of mobile learning [6]. All of these uses are to overcome how students communicate and interact, also to overcome various obstacles in student learning problems, supported by different motivations and functions as a form of the development of current technological trends. The use of mobile technology holds various learning functions including seamless mobile learning [7]. The popularity of Instagram as a social media used by millennials has grown day by day. The United States leads the ranking of countries with the most Instagram users with 110 million users as of April 2019, which uses Instagram to share and edit photos and short video. Brazil is second rank with 70 million Instagram users, India with an audience of 69 million users, while Indonesia is in fourth position with 59 million users. [8]. So the use of Instagram has been widely used in the following fields: entertainment or games, sports, artists, business promotion interests or advertisements [9]; [10], medic [11], and so forth. Most parents have positive support for mobile technology [12], including pre-service teachers having positive opinions about mobile devices [6].

Social media in general can be used for learning [13] social media in cellular as a catalyst to trigger transformative curriculum design [14] great potential as a social learning platform [15] such as facebook [16] youtube [17]. Before the advent of Instagram there were three of the strongest social media, Facebook, Wikipedia, YouTube, used as learning resources [18]. But Instagram should also be used for learning. This is so potential because Instagram as a platform that is familiar with students, Instagram is very interested for young learner because this social media is more focused on photos and videos that have short duration compared to other social media that focus on long paragraphs, words or status in the narrative words. [19], Instagram has advantages in the independence of visual images, photos, and short videos with creative designs [20]; [21]; [22], share photo [23], There are many advantages to using Instagram, including the availability of interactive properties and the ability to be used anywhere, anytime according to our needs. Using mobile technology or cellular learning [24] So Instagram is very appropriate to be used as a medium or aid in the learning process because of the availability of all the supporting components.

Whereas graphic design produces the best visual works especially through computers, graphic design is related to advertisements and visual works [25] all visual results in this world are produced from graphic design work with creative and innovative ideas and imaginations. Instagram functions to distribute visual works, through the facility of Instagram graphic design works can be directly presented and published. Instagram is suitable or appropriate to be a medium used to learn graphic design. But the current problem is the use of Instagram in the learning process of graphic design subjects is still very limited because of the inadequate ability of teachers to develop and use

Instagram so that an evaluation needs to be done [26] using the User Experience (UX) elements is very useful, because UX addresses the entire user experience [27] measurements through UX provide responses to design practitioners [28] measurement tools are available online using UEQ which has been used in assessing interactive media [29] has a benchmark and efficiency in quantitatively measuring the user experience of a product [30] The UEQ benchmark has six Attractiveness, Efficiency, Perspicuity, Dependability, Simulation and Novelty scales. By doing the UX evaluation, it is expected that Instagram will be able to be used for learning specifically graphic design lessons, lessons that design visual design and the strength of visual communication design.

Interestingly Instagram for learning as described previously, based on evidence reported in the literature about the positive impact of Instagram for learning on academic achievement and student attitudes. This study tested the user experience of students in the basic subjects of graphic design tenth grade students majoring in multimedia. The main question that drives this research is, "does Instagram-aided creative learning improve student graphic design learning outcomes? How is UX Instagram on graphic design learning?"

1.1 User Experience (UX)

User Experience or commonly referred to as UX is a person's perception and response resulting from the use of the product, definition by UX design professionals [28], interactive products become a source of user experience [27]. More simply, User Experience is how you feel about each interaction you are facing with what lies ahead and when you use it. UX is dynamic, context dependent, and subjective [31] To get a good User Experience, a product must have a match between product features and user needs. This then determines the product is significant or valuable. Thus the influence of user experience is expected to help design products or services with a greater UX level [32]. And the last thing, the product must be easy to use to complete or do things the user wants. Find things done with a few questions with the UEQ tool [29].

1.2 User Experience Questionnaire (UEQ)

User Experience Questionnaire (UEQ) is a quantitative data processing tool (survey) related to user experience that is easily applied, trusted and valid, which can be used to supplement data from other evaluation methods with subjective quality assessments [30]. UEQ allows rapid assessment of the interactive product user experience. The questionnaire format supports user responses to immediately express feelings, impressions, and attitudes that arise when using a product. Attitudes toward measuring user experience are more positive than those identified in interviews, and there is a nuanced view of the measurement details [28].

The main purpose of the User Experience Questionnaire (UEQ) is to enable fast and direct measurement of the interactive product user experience [33]. UEQ has been applied in various research contexts, for example for business software evaluation [29], user experience describes the user's subjective feelings for the product they are using. Different users or user groups may have different impressions about the user experience

of the same product. So, measuring user experience usually requires gathering feedback from a larger group of users. This can be done most efficiently with questionnaires, especially if such a questionnaire is used as an online tool.

1.3 Instagram as a social media

Instagram is a web-based communication tool that allows people to interact with one another by sharing and consuming information [34]. Websites and applications dedicated to forums, microblogging, social networking, social bookmarking, social curation, and Wikipedia are among the various types of social media.

In short, social media is a site where anyone can create a personal webpage, then connect with friends to share information and communicate. The biggest social media right now are Facebook, Twitter, LinkedIn, Google+ and Instagram. If traditional media uses print and broadcast media, then social media uses the internet network [34]. Social media is used for education and learning [35], social media supports various communication functions as well as pedagogic functions [13].

2 Method

2.1 Research design

This research uses a quantitative approach using a quasi-experimental non equivalent control group design [36], This design involved a group that was given a pre-test (O1), treatment (X), and post-test (O2). The success of Instagram-assisted graphic design learning is determined by comparing pre-test and post-test. In the pre-experimental study, one group pretest post-test, we carried out the first step by determining which samples would be used as samples and breaking them into one class research. The next stage is to provide a pre-test to measure learning outcomes before given graphic design learning assisted by Instagram. The next stage, the sample is given treatment using Instagram-assisted creative learning with mobile. Then, at the last stage, the sample is given a post-test to measure the results after which it is treated in the experimental and control groups. With the following designs:

Table 1. Experiment Implementation Procedures

	Meeting							
	1	2	3	4	5	6	7	8
Class	O1	Experimentation Class						O2
	O1	Control class						O2

Explanation:

O1 = Pretest

O2 = Posttest

To supplement UX quantitative data, this study uses the online UEQ test (www.ueq-online.org) and open-ended questions related to the user experience of Instagram to learn graphic design.

2.2 Population and sample of the research

The population taken was students in the tenth grade of information technology program multimedia studies in 2018/2019 as many as 144 students. The same retrieval technique is done by taking the entire population, considering there are only 144 students in four classes, two experimental classes and two control classes.

2.3 Measurement of instrument

The measurement scale of learning outcomes consisting of 12 items was used to achieve the objectives of this study. The item came from a review of questions about basic competencies, indicators and meeting materials. As for the application test the concept of using the description test totaling 12 questions, if a perfect answer is given a score of 8.3 if an imperfect answer is given a score of 4 and if no answer at all is given a score of 0, so the highest score for the description problem is 8.3 and lowest 0. Total urain score then multiplied by 12 so that the maximum score achieved is 100 and the lowest score 0. Includes:

Table 2. Grid of item application concept questions

Basic competencies	Item Code
Implement bitmap (raster) image processing software	1, 2
Using bitmap (raster) image processing software	3, 4
Implement raster image manipulation by using the effects feature	5, 6, 12
Manipulate raster images by using the effects feature	8, 9
Implement a bitmap (raster) based image design	7,10
Create a bitmap (raster) based image design	11

For UX instruments we use the Indonesian version, because there are several language versions of the questionnaire that were built and validated (for example, English, Spanish, Portuguese and others). These versions are available free of charge at www.ueq-online.org. The reliability of the UEQ scale is usually high, that is, the Cronbach-Alpha coefficient is usually greater than 0.7. The six elements or scales are translated into Indonesian as follows: Attractiveness, Clarity, Efficiency, Accuracy, Stimulation, and Novelty. UEQ contains 6 scales with a total of 26 items. namely:

Table 3. Grid ítem about UX

Scale	Item	Left	Right
Attraction	6 item	Annoying	Fun
		Good	Bad
		Dislike	Lovely
		Not Fun	Delightful
		Interesting	Not attractive
		Friendly	Not friendly
Perspicuity	4 item	Not understandable	Understandable
		Easy to Learn	Hard to Learn
		Difficult	Easy
		Vivid	Confusing
Efficiency	4 item	Fast	Slow
		Not efficient	Efficient
		Not practical	Practical
		Well Organize	Messy
Dependency	4 item	Predictable	Unpredictable
		Obstructive	Support
		Safe	Not Safe
		Meet expectations	Do not meet expectations
Stimulation	4 item	Worth	Inferior
		Boring	Fascinate
		Not Interesting	Interesting
		Motivate	Unmotivated
Novelty	4 item	Creative	Tiresome
		Inventive	Conventional
		Ordinary	Leading
		Conservative	Inovative

2.4 Data analysis

This research is included in the quantitative study of the validity and reliability have been analyzed and analyzed by different experts. Data analysis was started using an independent sample t-test. To know the difference in the average value of student learning outcomes, between the experimental class and the control class, 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 used the Levene Test quality test. Data analysis techniques in the study used MANOVA (Multivariate Analysis of Variance) with the help of the SPSS for Windows 24.0 program and all of the parametric assumptions above were carried out at a significance value of 5%. The using of Manova test in order to involves several dependent variables [37] This research consists of two variables namely the learning outcomes of understanding concepts and application of concepts whereas moderator variables are high and low user experiences.

3 Result

3.1 Instagram-assisted creative learning of learning outcomes

The mean score of the experimental group pretest learning outcomes is 70.82 with a standard deviation of 7.88 while the mean value of the pretest of the control group learning outcomes is 70.71 with a standard deviation of 7.88. The two are not different, meaning the two groups of subjects are homogeneous. Then after being given treatment the average value of the posttest experimental group learning outcomes was 84.39 with a standard deviation of 4.75 while the average value of the learning outcomes 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

	Mean	Standard Deviation
Pre test Experiments	70,82	7,88
Pre test Control	70,71	7,88
Post test Experiments	84,39	4,75
Post test Control	84,07	4,26

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

Based on the test results the value of the Levene Test as presented in table 5, shows that the class is homogeneous. Therefore, the independent sample test results on the post test values of the experimental and control classes use the value in the first line (equal variances assumed) that is known to the value of Sig. Levene's Test for Equality of Variance is $0.474 > 0.05$, so it can be interpreted that the data variance between the experimental and control groups is homogeneous or the same. Furthermore, that the interpretation of the Independent Samples Test output table above is 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 is a significant difference (real) between the average student learning outcomes in the experimental group of creative learning assisted by social media Instagram and the group control model of problem-based learning.

Later on, as seen the p-value (Sign. 2-Tailed) in table 5, it is known that the P-Value (Sign. 2-Tailed) value is $0,000 < 0.05$. Therefore, the difference is significant at the probability of 0.05. The magnitude of the difference in mean values as shown in the mean column of 3,944 means that the experimental group has an average value higher than the control group so that it can be concluded that the instagram-assisted creative learning applied to the experimental group is more effective than conventional learning applied to the group control seen from the acquisition of cognitive learning outcomes of students.

Hereinafter the hypothesis is proven to be true and significant, high and low UX on learning outcomes is significantly 0,000 smaller than <0.05 as well as the results of learning interactions and UX on learning outcomes, significant results are 0,000 smaller than <0.05 can be seen in the results testing independent and dependent variables individually (Tests of Between-Subjects Effects Manova) MANOVA is presented in table 6.

Table 5. Results of Independent T Test Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		<i>F</i>	<i>Sig.</i>	<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>	<i>Mean Difference</i>	<i>Std. Error Difference</i>
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

Table 6. Test result between-subjects effects of MANOVA

Tests of Between-Subjects Effects						
<i>Source</i>	<i>Dependent Variable</i>	<i>Type III Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Corrected Model	Understanding	3520.987a	3	1173.662	59.990	.000
	Application	2562.370b	3	854.123	37.256	.000
Intercept	Understanding	1030178.107	1	1030178.107	52655.813	.000
	Application	1029706.097	1	1029706.097	44914.870	.000
Learning	Understanding	253.356	1	253.356	12.950	.000
	Application	117.687	1	117.687	5.133	.025
UX	Understanding	2794.302	1	2794.302	142.826	.000
	Application	1635.066	1	1635.066	71.320	.000
Learning * UX	Understanding	214.929	1	214.929	10.986	.001
	Application	674.421	1	674.421	29.418	.000
Error	Understanding	2739.013	140	19.564		
	Application	3209.602	140	22.926		
Total	Understanding	1050744.000	144			
	Application	1046512.000	144			
Corrected Total	Understanding	6260.000	143			
	Application	5771.972	143			

a. R Squared = ,562 (Adjusted R Squared = ,553)

b. R Squared = ,444 (Adjusted R Squared = ,432)

3.2. User experience on instagram to learn graphic design

Instagram as a media of learning and publishing a work and design results, it is made clear in the findings of this study, that there is an average value of six UX items (attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty) that have been

tested with UEQ Online, with The benchmarks found four items with Excellent, one item with Above Average and one with Good benchmark. UX research results can be seen in the color code according to the group and instrument items on the right and left points. The results can be seen in table 7:

Table 7. The value of the results of the UX respondents' answers

Item	Mean	Variance	Std. Dev.	Left	Right	Scale	
1	1,4	1,9	1,4	Annoying	Enjoyable	Attractiveness	
2	0,9	2,4	1,5	Not understandable	Understandable	Perspiciuity	
3	2,1	0,9	0,9	Creative	Dull	Novelty	
4	2,3	1,1	1,1	Easy to learn	Difficult to learn	Perspiciuity	
5	2,1	0,8	0,9	Valuable	Inferior	Stimulation	
6	1,9	1,7	1,3	Boring	Exciting	Stimulation	
7	1,4	2,1	1,4	Not interesting	Interesting	Stimulation	
8	1,1	2,5	1,6	Unpredictable	Predictable	Dependability	
9	2,2	1,4	1,2	Fast	Slow	Efficiency	
10	1,3	1,7	1,3	Inventive	Conventional	Novelty	
11	1,5	2,3	1,5	Obstructive	Supportive	Dependability	
12	2,2	1,1	1,0	Good	Bad	Attractiveness	
13	0,7	2,8	1,7	Complicated	Easy	Perspiciuity	
14	2,0	1,0	1,0	Unlikable	Pleasing	Attractiveness	
15	0,5	1,7	1,3	Usual	Leading edge	Novelty	
16	1,4	1,9	1,4	Unpleasant	Pleasant	Attractiveness	
17	2,3	0,9	1,0	Secure	Not secure	Dependability	
18	2,3	0,9	1,0	Motivating	Demotivating	Stimulation	
19	2,1	1,1	1,0	Meets expectations	Does not meet expectations	Dependability	
20	1,8	1,2	1,1	Inefficient	Efficient	Efficiency	
21	2,2	1,4	1,2	Clear	Confusing	Perspiciuity	
22	2,0	0,9	1,0	Impractical	Practical	Efficiency	
23	2,0	0,5	0,7	Organized	Cluttered	Efficiency	
24	2,0	0,9	1,0	Attractive	Unattractive	Attractiveness	
25	1,8	1,2	1,1	Friendly	Unfriendly	Attractiveness	
26	1,4	3,1	1,7	Conservative	Innovative	Novelty	

Then, we found UX Instagram on four scales that were categorized as excellent, namely the Attractiveness, Efficiency, Dependability and Stimulation scales, while the Perspiciuity scale was categorized as Above Average and Novelty categorized as Good according to the benchmark interval set by UEQ. The following knows the benchmarks of the calculation results at UEQ can be seen in Figure 1.

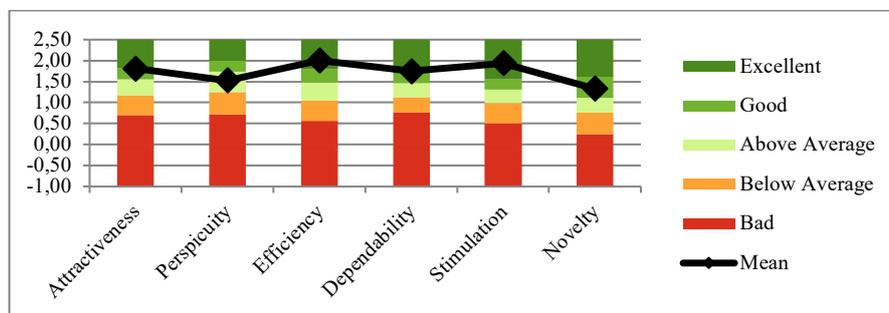


Fig. 1. Results on UEQ Benchmarks

Hereafter, our findings with an average impression value between -0.8 and 0.8 are normal evaluation values, values > 0.8 are positive evaluations and values < -0.8 are negative evaluations. So, it can be concluded that the application of Instagram as a media for learning graphic design, a place for publication and displaying student work tends to have positive impressions (values are in the direction of 1 and above) successively decreasing in the group efficiency, attractiveness, dependability, perspicuity, stimulation and novelty.

Table 8. UEQ Benchmark - Average Value for each Factor

Table to create the benchmark graph (purely technical, please ignore)							
Scale	Lower Border	Bad	Below Average	Above Average	Good	Excellent	Mean
Attractiveness	-1,00	0,7	0,47	0,39	0,27	0,67	1,81
Perspicuity	-1,00	0,71	0,54	0,48	0,27	0,5	1,53
Efficiency	-1,00	0,57	0,48	0,43	0,32	0,7	2,00
Dependability	-1,00	0,77	0,36	0,33	0,23	0,81	1,75
Stimulation	-1,00	0,5	0,49	0,32	0,24	0,95	1,94
Novelty	-1,00	0,25	0,52	0,35	0,49	0,89	1,33

The results on the Attractiveness scale finding have an average value of 1.81 in the Excellent position with an interpretation of 10% better results, 75% worse results, on the Perspicuity scale there is an average value of 1.53 Above Average positions with an interpretation of 25% better results, 50% worse results, on the Efficiency scale there is an average value of 2.00 Excellent positions with interpretation in the range of 10% best results, On the Dependability scale there is an average value of 1.75 Excellent positions with interpretations in the range of 10% best results, At Stimulation scale, there is an average value of 1.94 Excellent positions with an interpretation in the range of 10% of the best results, on the Novelty scale there are results of an average value of 1.33 Good positions with an interpretation of 10% better results, 75% worse results.

4 Discussion

4.1 The cause of the high comparison of the average value of creative learning aided by graphic design learning lessons

The findings of this study showed that the average student learning outcomes in the experimental class using Instagram-assisted learning was higher than the control class using Instagram-assisted learning control in graphic design subjects. Hypothesis test results using the Independent Sample Test there are high differences, H0 rejected and H1 accepted or there were significant differences from the two experimental class groups and the control class.

There are several factors causing the achievement of high learning outcomes, First, Instagram as a social media is liked by students and easy to use, besides that Instagram is trying to integrate it into a new power of m-learning [38], supporting Al-Ali's (2014) research which found the use of Instagram to learn languages shows that students' initiatives were not enthusiastic at first, but students gradually completed writing activities, they welcomed the idea and were encouraged to be creative [38]. Second, student addiction to social media [39], easy to operate, graphic design on Instagram can develop comfortably and pleasantly so that it affects the value of students' learning outcomes in the cognitive application [40]. Third, Graphic design lessons are incorporating the field of cognitive science into instructional technology so that the effectiveness of graphic design using Instagram can be optimized [41] Fourth, learning used in achieving high learning outcomes uses creative learning strategies, where creative learning guides daily lessons with the aim of gaining deep-rooted knowledge through creative processes while solving standards-based problems. Through this work we aim to expand the reach of analytic learning into serious games [42-45]. Creative solutions are associated with knowledge that was previously known / remembered, identified, newly acquired, applied before, newly applied, practiced, planned, compared, contrasted, made/produced, assessed/evaluated, presented and remade [46]. Fifth, Through creative learning assisted by social media especially Instagram [47] students can explore their imagination, creativity, skills, grow their potential for learning, as motivation and present their work of graphic design in a comfortable and enjoyable way.

4.2 User experience on Instagram for learning graphic design

Instagram for learn graphic design using the @kuliahdsgn2019 account as the main account of teachers and students. Through this Instagram students can start lessons and complete learning tasks in Instagram form, students look for material and find ideas and ideas through hashtags (#) on Instagram. Then on Instagram students can directly publish their Instagram work on their account or use the specified hashtag, for example #officialmm1lmm2, #ximm1account.



Fig. 2. Instagram display @ kuliahdesign2019 in learning graphic design

The findings from the UEQ test results with six scales, instagram user experience in learning graphic design with Instagram results on the scale of Attractiveness, Efficiency, Dependability and Stimulation are in an Excellent position, students feel the learning fun, not bored and bored. As well as on the Perspicuity scale Above Average position, on the Novelty scale Good position in learning graphic design students discover many new things, students find ideas and ideas quickly and enrich design insights, Instagram has a hashtag (#) that is full of visual power that can stimulate the imagination and the creativity potential of students in creating.

Based on Kolokytha [48] the use of Instagram to learn graphic design is very helpful for students, where this lesson requires the power of imagination. Weakness of

imagination becomes an obstacle in graphic design lessons; students' imagination in working with all the potential psychological power to process their cognitive potential makes good and creative work. Instagram makes graphic design work easy, given that graphic design is heavy and difficult, many aspects affect the design, perception aspects, alignment detection aspects, and hierarchical segmentation [49]. Through Instagram students find many ideas, design patterns and how students work as beginners sometimes have problems in starting designs and finding ideas. So using Instagram students is very helpful in finding design ideas, including in assessing the design [50] communication constraints of students and teachers in learning can be overcome by the use of social media [51], students can learn anywhere and anytime to hone their cognitive skills and knowledge towards high learning outcomes [25].

Instagram for learning graphic design from the side of "clarity", and "novelty" can be said that it is a new discovery in learning graphic design, has a novelty for creative learning graphic design for high school students. Instagram helps students discover new things and find imagination to work on and do design work. Furthermore, for any lesson, if it requires the power of imagination, ideas and ideas of students, then Instagram can be used in lessons because Instagram is liked by students and has the power to attract and eliminate boredom in learning. Furthermore, if all this time the teaching material has only been adhered to in books and manuals, then through Instagram the teaching material provided a solution as a digital teaching material, interesting and enjoyable for students meaning that any learning can use Instagram as from the findings of this study. This Instagram research directs behavior through mobile phonetechnology (mobile learning) in an effective way to be used for creative learning of graphic design lessons and needs to be developed into a medium for teaching material development on all subject matter, instagram can be used as an alternative and adoption becomes e-learning in future research.

5 Conclusion

Instagram-assisted learning has high average learning outcomes, the effect of Instagram and UX-assisted creative learning on the learning outcomes of learning and application concepts is with significant results and categories. Instagram in the experimental class uses Instagram as well as control. Then it can be concluded that learning with Instagram will have a real and significant influence on student learning outcomes. Then for UEQ test results on UX Instagram analysis to learn graphic design found in the position above Good to Excellent position shows Instagram is a good tool to explore the imagination, ideas and productivity of students in learning graphic design that requires strength and wealth of imagination in order to have quality results design work. An important finding is on the teacher's role to innovate the learning process, the teacher guides and becomes a facilitator on creative learning to make learning more creative, enjoyable, based on student experience, experiments, presentations, and inspires all students.

This study recommends that graphic design teachers and further research add additional 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, and so on. It needs to be done as a part that can be utilized in effective, efficient and attractive learning.

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