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E-learning for facilitating learning

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Abstract— **E-learning usefulness as a supporting system in learning is famous, and even though the research about e-learning has been done, the research about motivation effect in the context of e-learning usefulness in learning is still an interesting topic to be discussed. Because of that, some of major purposes about e-learning usefulness in learning are to facilitate learning process, improving performance of students, and to observe literature in e-learning usefulness. The literature shows that the researchers and practitioners consider some of important aspects in order to make sure that e-learning is a part of blended learning system that can optimize the students learning experience. This research was done using 2 parallel classes of algorithm programming course in Bina Insani campus. The result of the experimental research that has been done in one semester for algorithm programming class by comparing X1 learning method with blended learning and X2 learning method a conventional method without blended learning showed that X1 is better than X2, which means that learning to blended learning method is better than conventional teaching methods -0.29941 Number t is smaller than the number of t table is -1.6611, then H0 rejected. ARCS model for motivating students in the context of algorithm programming class using blended learning are with category fun is result 27 percent.**

Keywords— E-learning, facilitating learning and performance improvement

I. INTRODUCTION

So far, the research in e-learning has been focused on the effectiveness method of learning and the design only. In that research, the writer tried to analyze and discuss the determinant motivation in effectiveness and learning quality by using e-learning from social cognitive perspective as a learning support.

Based on a survey internetworldstat.com 2015 ,at the present time, Indonesia is in the second worldwide position for Manga on line comic reader. 80% of time has been spent in front of a gadget. By looking at the data, we would like to use the opportunity to make an application that can facilitate a learning process and improve the student performance so that we can motivate the students to learn independently anywhere. It can also be suitable with their learning style because right now, the students mobility is high, and because of that, even the learning process must be followed, e-learning is needed to increase the knowledge.

The challenges in learning process are the learning content that is growing fast dynamically, knowledge of the students that can be equal or better than the teachers, the students that can do alternative learning activities independently, new technology that is growing fast so that can make the learning process becomes easy, also there are many choices of learning resources that can be used for teachers and students too.

II. LEARNING THEORIES AND INTERACTIVITY.

A. E-learning Definitions

Virtual learning environments as spaces where creativity, problem solving, communication, collaboration, experimentation, and inquiry can happen. E-learning is a form of information and communication technology utilization in instructional process. E-learning provides access to anyone to obtain comprehensive information by utilizing the world wide web. According to [12][5] e-Learning is content and instructional methods delivered on a computer (whether on CD-ROM, the Internet, or an intranet), and designed to build knowledge and skills related to individual or organizational goals. There are many definitions and assumptions regarding e-Learning, While many are correct to a certain point, very few seem to capture the essence of what e-learning is. Here are some common definitions:

- Education via the Internet, network, or CD-ROM
- E-Learning is all about learners – capturing their attention with content specifically designed to meet their immediate needs in a self-paced and comfortable environment
- E-Learning allows learners to learn by doing, by being involved, by receiving immediate feedback, and by allowing them to monitor their progress with quizzes, tests, and handson activities

The implementation of e-learning is aimed at addressing the problem of time and space separation between learners and teachers through the medium of the computer. Learners can obtain learning materials that have been designed in a learning package available in the Internet. By implementing e-learning, learners can study the learning materials themselves or if necessary can ask for help in the form of interaction that is facilitated by the teacher.

If access to the Internet is not a problem, learners can study anywhere in accordance with the speed of learning and owned

conditions since learning materials are always available in computer networks and the Internet. By utilizing information and communication technology, access to a variety of learning resources is available more widely.
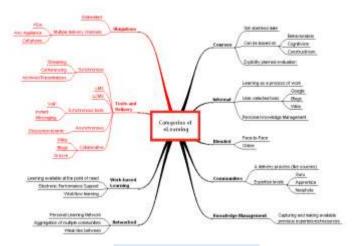

Figure 1 e-laerning category *[13]*

B. Blended Learning

Blended Learning (BL) is combination of face-to-face classroom teaching with lecture and class formats and the use of an asynchronous online classroom. It means that the students has to attend face-to-face meetings in the classroom, but also has access to an asynchronous virtual course to do other learning activities. The purpose of providing an online or virtual course is to enhanced student learning process and outcomes through additional reading, browsing additional materials in websites, watching video, in combination with self-assessment and assignments and online discussion forum [1]. The delivery of blended learning is inevitably requires a wide spectrum of information communication technologies (ICT). Through Internet tools, a wide range of resources and content can be shared easily. Therefore, the Internet is playing a crucial role in delivery of higher education lectures [3].

C. Motivation Theory

[6] ARCS model (The Attention, Relevance, Confidence, and Satisfaction) is a closeness to an instructional design using multimedia technology which based on syntactical motivation concept to motivate students in e-learning context. The first condition to motivate is that the learning material should be attractive and it can maintain the students attention (A).This on reinforcement and attribution theories that have been used in other class subject such as I/OP Psychology.requirement is based on a research about curiosity, patience, and boredom. The second condition to motivate is to build relevancy (R). This requirement is based on a research about intrinsic motivation and competency as the target theory for the act of

determining their own destiny. The third condition to motivate is to build confidence (C). This requirement is based on a research about self-efficacy and attribution. The fourth condition is satisfaction (S). This requirement is based.

ARCS model is a ten systematic steps design to develop motivation element in instructional arrangement. The ten steps are to get information only, to get students information, to analyze students, to analyze learning materials, the list of goals and scoring, the list of potential tactics, to choose and design the tactics and to integrate them with the instruction, to choose and develop learning materials, also to evaluate and to revise them.

III. METHODOLOGY

We did a survey in two algorithm programming classes in Bina Insani Campus for experimental research. The first class consists of 45 students with characteristic condition that enjoy playing computer games because of their community so that we used blended learning method, while in the other class that consists of 40 students, we used face to face or conventional method [9].

To manage the difference of teaching style, both classes were taught by the same lecturer and students from both classes received the same amount of lesson, including examples and exercises. Besides that, the students got feedback from the lecturer in order to measure against what the students have learned that should be related with the subject every session.

IV. ANALYSIS,IMPLEMENTATION AND RESULT

In the blended learning research, we used pdf learning material, games link (Fig. 3) and virtual face to face meeting link (Fig. 2) that were saved in the class website. The website page on the first picture was made to show the face to face meeting information where the students can interact directly with the lecturer, while on the second picture we can see the website link for coding lesson material in the form of games.

Figure 2. face to face meeting

Figure 3. website link for coding

We did a test of normality to compare the first variable (using blended learning method) with the second variable (using conventional learning method). We believe that using both variables represent the development of information and communication technology at the moment, so that can be adapted in implementation of conventional learning method which is known without using technology of information and communication to facilitate learning process and improving the performance [4] [7]. During the process of analyzing data that has been done, we used the study result test in using blended learning method (X1) in a 45 students class and using conventional learning method (X2) in a 40 students class.

The analysis explanation in making a conclusion about the comparison of two variables are stated below [9]. :
The first step, the result of the normality test in blended learning class (X1) is as follow :

Table 1. Descriptive statistics blended learning

N	45
Mean	65.31
Std.	8.201503
L-count	0.123457
L-tabel	0.132077

Table 2. Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
X1	.123	45	.083	.953	45	.067
X2	.135	40	.066	.971	40	.376

a. Lilliefors Significance Correction

Because L-count is smaller than L-table and the significant value in the normality test shows that it is 0.83 bigger than 0.05, so X1 has a normal distribution.

The second step, the result of the normality test in a conventional learning class (X2) is as follow :

Table 3. Descriptive statistics conventional learning

N	40
Mean	65.925
Std.	10.65638
L-count	0.134586
L-tabel	0.15913

Table 4. Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
X1	.123	45	.083	.953	45	.067
X2	.135	40	.066	.971	40	.376

a.LillieforsSignificance Correction

Because L-count is smaller than L-table and the significant value in the normality test shows that it is 0.66 bigger than 0.05, so X2 has a normal distribution.

The third step is to test the hypotheses parameter :

1. The hypotheses that were tested :
   H0: $\mu1 = \mu2$
   H1: $\mu1 \neq \mu2$
2. To count the t statistic test using t formula
   $= (x1bar - x2bar)/(s*sqrt(1/n1+1/n2))$ ………..(1)
   and s formula
   $= sqrt(((n1-1)*s1^2+(n2-1)*s2^2)/(n1+n2-2))$….(2)

Table 5. t-count using t formula

	X1	X2
N	45	40
Mean	65.3111111	65.925
Std.	8.2015027	10.6564
Variance	67.2646465	113.558
s	9.434887479	
t count =	-0.299419332	

with signifikanci level $\alpha = 0.05$ and degrees of freedom is :
n1 + n2 - 2 = 45 + 40-2 = 93
    T table = 1.6611
H0 is rejected if t > t table or t < - t table
Because t = -0.29941 < -1.6611 , then H0 rejected

With a significance level of 0.05 t table = 1.6686
Because t < the table was , then H0 rejected
Test criteria : totak H0 if t count < - t table

After analyzing based on our capability, we decided to make a conclusion as follow :
We have compared X1 (blended learning class) with X2 (conventional learning class) and from the result that we

received, X1 is better than X2, that means blended learning system is better than conventional learning system because there is a difference in the average score of learning subjects that were taught between blended learning class and conventional class.

Analyzing motivation has to become a running process to make sure that the blended learning resource matches the motivation factor as a running learning system. ARCS model has given some special procedures to check the relevancy of motivation features in using multimedia learning system[10]. The survey result from the students of algorithm programming in blended learning class is as follow :

Table 7. survei motivation for blended learning

Categories	Respondent	Percentage
Concentration	7	16%
Fun	12	27%
Interesting	9	20%
Like	6	13%
Persistence	5	11%
Confidence	4	9%
Frustrated (negative)	2	4%
Total	45	100%

ARCS model (Attention, Relevance, Confidence, and Satisfaction) for motivating students in the context of algorithm programming class using blended learning are as follow [11]:

1. The first condition is that the learning process should be interesting and able to keep the students attention (A). In this case, there are face to face meetings with the lecturer so that the students will have a big curiosity, passion, and they won't be bored.

2. The second condition to motivate is to build relevancy (R). The learning material and games are provided because the intrinsic motivation and competency of the students.

3. The third condition to motivate students is to build their confidence (C). By using interactive games, students will feel confident in writing codes, and if they often play the games, the students will be able to build their logical reasoning and thinking in visualizing their own games.

4. The fourth condition is satisfaction (S). Students feel happy when they can write the codes for programming and run them until finish.

V. CONCLUSION

In learning process, e-learning is often used, starts from text, pictures, animation, videos, audio, and links, to motivate students so that they will enjoy the learning material in order to remember the importance of intrinsic motivation for students during their learning process.

The exploration of study result between conventional class and blended learning class is showing a significant difference because the combination of learning and teaching method from face to face learning method by using multimedia and cyber connection for a certain condition that has been mentioned before.

This research was done using 2 parallel classes of algorithm programming course in Bina Insani campus. The result of the experimental research that has been done in one semester for algorithm programming class by comparing X1 learning method (with blended learning) and X2 learning method (a conventional method without blended learning) showed that X1 is better than X2, which means that learning with blended learning method is better than conventional learning method. t count = -0.29941 < -1.6611, then H0 rejected. ARCS model for motivating students in the context of algorithm programming class using blended learning are with category fun is result 27%.

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