The implementation of blended learning models based liveaboard against affective aspects in modern physics course

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ABSTRACT

This study aims to know the implementation of blended learning models using liveaboard to affective aspects in modern physics course. The method used in this study was a pre-experimental design (nondesign) with the design of the study one group pretest-posttest design. The population in the study were all students of physics education UHAMKA. The sample used purposive sampling entire fourth-semester students of physics education as many as 22 people. To view the affective aspects of the modern physics course as evidenced by calculating the index gain. The results of N-gain in the course of modern physics based on a questionnaire obtained a practical value of 0.59 with a percentage of 62.82 percent of student's possible value. Results of simple linear regression demonstrate the importance of Y = 45.578 + 0,422X. Based on the cost can be seen that the learning model of blended learning influences the affective aspects of students. In the hypothesis test, used t-test obtained in modern physics t_{count} = 1,818 with t_{table} = 1.717 at α = 0.05, so H_0 was rejected, which states that there was a significant influence on learning using blended models based learning liveboard terms of affective aspects.

Keywords: Affective, blended learning, liveaboard

INTRODUCTION

Learning is a difficult and complex process. Some of the parameters that must be considered in the characteristics of learners in between perception and operations knowledge, general skills, development potential, and environmental factors play an important role in the process. In the process of learning, educators should be able to read the dominant character of the learners. One characteristic learners to note is the difference in learning style. Learning styles of learners have differences with each other (Özyurt & Özyurt, 2015; Surahman & Surjono, 2017).

One of the six elements of 21st-century learning (Partnership for 21st-century skills, 2002) is the information literacy and ICT literacy. For the information literacy skills and ICT literacy learners also develops the integration of ICT in learning needs to be done. Enhancer's competence and information literacy ICT literacy learners can effectively be done in a way to integrate ICT, including the Internet as a tool in the learning process (Wijayanti, Padma, and Suana, 2017; Yılmaz and Orhan, 2010).

Learning technology is the theory and practice in designing, developing, utilizing, managing, and assessing processes and

resources for learning. Operationally educational technology can be regarded as a process that applying in helping to solve the problem of learning in humans. Activities are applying contains two meanings: the first, that systemic or irregular, and the second are systemically poisoned on the system concept. Activity regularity are activities to meet the demands made by assessing the needs of themselves first, and then formulate the goals, identifies the achievement of objectives taking into account the existing constraints, determine the criteria for the selection possibilities, choose the best possibilities, develop and test piloted the possibility selected (Gusmaneli, 2012; Yusufhadi, 2004).

Learning does not only rely on the technological aspects of this course is essentially due to the learning process over the process of interaction between teachers, students, and learning resources. Although e-learning can be used by students independently, but the existence of a very significant teacher as a guide that serves to give support and facilitation for students in the learning process. In other words, the face becomes inevitable, and in the learning process. Therefore, the learning model that tries to combine (blending) method of face to face learning with e-learning in an integrative and systematic in the hope of learning more meaningful (Plummer, 2012; Sharif, 2012).

Blended learning is a combination of instruction of two different educational models the traditional face to face education and e-learning education. Where Allen and Seaman are presenting blended learning based on the percentage of use of e-learning in the process of face to face meetings. According to their definition, pure e-learning, blended learning, learning enhanced through the Internet and traditional learning utilizing e-learning delivery percentages respectively by 80% -100%, 30-79%, 1-29%, and 0%. There are various terms used for a combination of technology-based learning activities with face-to-face activities, ie, blended learning and hybrid learning (Lam, 2014; McNaught, 2011; Ross & Gage, 2006).

In line with that, big, a focus also expressed his opinion about the blended learning, according to the model of blended learning combines teaching methods and strategies with the help of virtual technology. This model can be done not only during the learning process face to face but also wherever they are as long as there is internet access (Dobrzański & Brom, 2008; Sandi, 2012). The learning process using blended learning models can provide additional time for students to understand the material. This allows students to repeat the learning material. Students can improve the mastery of learning by repeating learn learning materials several times, train the problems both independently and in groups. Also, this blended learning simplify and accelerate the process of nonstop communication between teachers and students (Eklund, Kay, & Lynch, 2003; Sandi, 2012; Santoso, 2008).

The level of satisfaction of learners with blended learning is important. Therefore, the research focus only on the factors that influence the satisfaction of learners in blended learning environments. There are six dimensions: (1) students, (2) the instructor, (3) organization, (4) technology, (5) design, and (6) the environment. Where in research Chen, Yong, and Yao (2016), concluded that students (youth) prioritized dimensional design to be the most impotant factor in their satisfaction with the e-learning component in a blended learning environment. Therefore, it may be more strategic for educational institutions to emphasize on the design dimensions in the implementation of their e-learning in a blended learning environment specifically for young learners (Sutisna, 2016).

The ability of graduates of a given education level by the demands of the application of the competency-based curriculum includes three domains, namely the ability to think, did the job skills, and behavior. Affective abilities related to the interests and attitudes that can be shaped responsibility, cooperation, discipline, commitment, confidence, honesty, respect for the opinions of others, and the ability to control himself. Affective issues considered important by everyone, but its implementation

is still lacking. This is due to the design effective achievement of learning objectives is not as easy as cognitive and psychomotor learning. Education units should design appropriate learning activities that affective learning objectives can be achieved (Wulandari, Utomo & Suryadi, 2019).

Learning strategy is an approach to achieve the objectives to be achieved by the philosophy and theory of learning. Abdul Majid (2013), describes the affective domain measurement that can not be done at any time. Changes in a person's behavior also requires a long time, because that was changed is not the behavior of knowledge (Alifah, 2019). Affective learning is to learn to appreciate the value of an object through a natural feeling that the object can be a person, object or event/events (Pulungan, 2013). Affective needed anyway at the level of the course. However, the implementation is still not due to problems in selecting or designing needs appropriate learning activities.

Therefore blended learning is an element that tends to improve the quality of education that is consistent with the development of the modern era. To increase the attention of students to learn better. Making the learning materials tailored to the needs of planning and learning, one of the devices can manage to learn that liveaboard. Liveaboard an interactive whiteboard application that the user to build a virtual classroom online. This development is to support the global educational framework because it makes it easy to create online learning materials. Completeness contained in liveaboard used for additional online learning so that learning more exciting and useful. Based on the reasons stated above,

RESEARCH METHODS

The population in this study were all students of physics education school year 2018/2019 and sampling using purposive sampling. Samples taken are 4th-semester physical education as many as 22 students. The method used in this study is a method of pre-experimental design (nondesign), and the research design of this study, one group pretest-posttest design. Tests performed twice ie, before the experiment called pretest and post-test experiment called the posttest. This research was conducted at the University of Muhammadiyah Prof. DR. HAMKA. The following stages of the research carried out, shown in Figure 1.


Figure 1. Research stage of blended learning

The process is done in this research through the three stages of the pretest, treatment, post-test. Phase pretest, students are given an essay about half of the Schrodinger equation for 4 with time estimates for three credits. Treatment stage, at this stage, given the treatment in the form of conventional learning liveaboard-based and blended learning. Posttest phase, students are given an essay about the Schrodinger equation for the semester 4. post-test results will be used as the data to see the effect of blended learning models liveaboard based on modern physics course before and after receiving treatment. Affective measure in this study refers to the dimensions of which are reflections, attitudes and values, behavior, expression, internalization of beliefs, feelings, learning objectives, interests and ideas, emotions, and consciousness. Processing this data using a Likert scale.

Collecting data using a non-test instrument. Affective abilities were measured tiered -A5 A1, which includes two attitudes, is the attitude of spiritual and scientific beliefs (fair, thorough, responsibility, caring, cooperation, and safety work). Affective abilities of students was measured using a questionnaire measuring

attitude scales contain a statement of positive and negative, with a choice of response to each account is very Agree (SS), agree (S), disagree (KS), disagree (TS), and strongly disagree (STS) (Marianingsih, Asmawati, Agrania, & Leksono, 2019)

RESULTS AND DISCUSSION
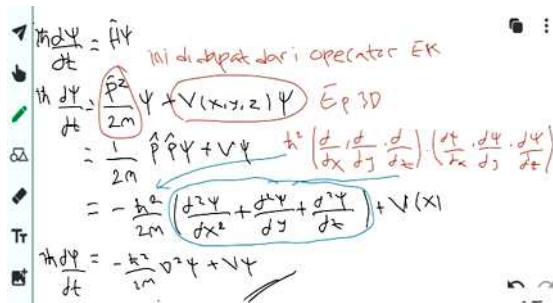
Figure 2. the learning process using

Figure 3. Features provided in the liveaboard

Learning begins with informing learning blended learning concepts that fit the needs of students. After discussing it then found that the result of conventional education and blended learning is done alternately in each meeting. Next Content learning is done with live streaming through Liveboard application. So the first student should have the form that has been available in PlayStore. After the student to register and sign in to the use, after which the students perform a join session to view the live stream on the application. At this stage of the learning activities, both conventional and blended learning, has been running eight meetings. Overall meetings have been held and by the agreement at the beginning of the meeting.

A value between 50-53 is only one student who got it or 4.54% of the total number of students. While the amount that most students obtained a value between 38-41 owned by

nine students or 40.91% of the total number of students. Data from posttest results gathered frequency distribution is known that as many as four students who scored 45-51 or as a percentage of 18,18% of the total number of students. The highest value is a value between 87-93 is only one student who got it or 4.54% of the total number of students. While the amount that most students obtained a value between 52-58 owned by seven students or by 31.82% of the total number of students. The result of the acquisition value of the average cost of the N-gain can be seen in Table 1.

Table 1. Obtaining N-gain affective abilities

N	posttest	Affective	*N-gain*
22	62.23	89.23	0.59

Based on Table 1 above, the value of 62.23 at posttest obtained from the average number of respondents that there is, on the practical value of 89.23 is obtained from the average number of questionnaires that have been filled in each respondent, and it can be seen that the results of the N-gain is 0.59. Because 0,59 included into $0.3 < g \leq 0.7$ then get into the middle criteria.

Table 2. Twenty two data recap questionnaire respondents affective

Indicator	the number who answered					Total	Ave	Percen
	1	2	3	4	5			
Total score	14	28	225	197	86	550	3,57	62,82

That is the quality of the affective aspect after the treatment given criteria into being. Percentage of vote attitude can be seen from the table that the reaction or response from the students included in the category enough for modern physics course than before using liveaboard said to be less interested.

The next measurement is normality test using test Liliefors (Lo) to the extent significant 0:05 to know the data obtained N-gain standard or not listed in Table 3.

Table 3. Normality test results

α	N	L_{count}	L_{table}	Criteria
0:05	22	0.1481	0.1832	Normal

Based on Table 3. The obtained value L_{count} = 0.1481 and L_{table} = 0.1832 with a significance level α = 0.05 and the number of samples (n) as many as 22 students. Testing criteria: if Lo < L_{table} sample is normally distributed, it can be concluded Lhitung value = 0.1481 < L_{table} = 0.1832 which means the normal distribution of data.

After knowing the results of the study were normally distributed, then homogeneity testing was carried out. An experimental class homogeneity test using Bartlett's analysis has been done to get the results, as shown in Table 4.

Table 4. Results of the homogeneity test

α	N	χ^2_h	χ^2_t	Criteria
0.05	22	4.496	18.31	Homogeneous

From the calculation of homogeneity, the result χ^2_h = 4,496 and χ^2_t = 18.31 with significance level α = 0.05 and the number of samples (n) as many as 22 students. It can be concluded that χ^2_h = 4,496 < χ^2_t = 18,31; it can be found that the data obtained from the population is homogeneous. After getting the results of homogeneity and distribution normality and usual homogeneity, followed by testing hypotheses to answer the research of truth. A detailed explanation can be seen in Table 4.

Table 5. Hypothesis test results

n	t_{count}	t_{table}	α	Criteria
22	1,818	1.171	0.05	*Ho* rejected

Based on Table 5, the calculation of the pretest and posttest of data obtained t_{count} = 1,818 with the number of respondents 22 students with significance level α = 0:05, t_{table} = 1,717. It can be concluded that, t_{count} < t_{table} (1.818 > 1.717) then H_0 rejected and H_1 accepted, which states that there are significant liveaboard-based blended learning models in terms of affective aspects.

In the study conducted at the University of Physics Education, Prof. Muhmmadiyah DR. HAMKA advanced physics class. Students at the beginning of the meeting is given in the form of essays pretest. The treatment is presented in this class, namely the application of the influence of blended learning models based on liveaboard the terms of affective aspects. After being given treatment at the course, students are given a posttest at the end of the meeting to see whether or not the influence of the implementation of blended learning models based liveaboard the terms of affective aspects in the learning process in the classroom and online.

In the process and learning activities by applying blended learning models based on liveaboard reviewed from practical aspects. Visible emotional dimensions are related to attitudes and values, so that they can see the character of a person in terms of learning activities. Implementation of applying the model of blended learning with a review of the affective aspects can see the readiness to do the teaching, the ability to understand the learning material, timeliness in doing the task, liveliness asked, cooperation is high in a problem, have the independence in learning, and assess the behavior attitude in learning activities

Results of research conducted by Khoiroh, et al. (2017) states that for the affective domain using blended learning models, there are significant learning outcomes of students with high learning motivation more than the learning outcomes of students with low learning motivation in the subjects of ICT. In corresponding with the results of Yuniarto (2013), which shows the students actively involved in asking questions, and participate in discussions on the online activities of students while focusing on the reviews in completing the task in the discussion forum.

The results of applying the affective aspects of blended learning models based on liveaboard not ultimately worked well, because of the maximal time in the learning process. The implementation of mixed learning models is only on one subject only, so it is necessary to prove in other items. Therefore this model is still not fully measurable said that this model is the full effect to be used in learning, But by doing discussion in online education,

provide more opportunities for students to ask things related to learning to maximize the time and make the process learning be active.

CONCLUSION

Based on the discussion of the results of research on the effect of the Model Blended Learning-Based Liveboard viewed from the aspect of Affective on the Course of Modern Physics, it can be concluded that in this study, using the model of blended learning based Liveaboard in the course of modern physics students can actively in the learning process and makes learning fun.

For other researchers who will use blended learning models, should be able to develop online learning media in a variety of learning materials, as well as the observation at the university that will be used more extensively. It is intended that the researchers were able to estimate the research concepts clearly, and research goes well also optimal.

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