The influence of the blended learning model supports e-learning (Edmodo) on student learning achievements the main material of buffer solutions in SMA 1 Banyudono academic year 2018

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Abstract. Blended Learning research model supported by e-Learning (edmodo) on student learning achievement and suitability of the blended learning model with the basic material supporting class XI MIPA in SMA 1 Banyudono Academic Year 2018/2019. This research is a quantitative study using quasi-experimental (Quasi Experimental Review). The data in this study are the learning achievement data of knowledge, attitudes and skills analyzed using the Independent Sample t-Test. The research sample consisted of two classes. Data collection techniques with test and nonest, pretest-posttest, questionnaire, observation, and documentation. The results showed that there was the influence of the blended learning model supported by e-learning (edmodo) on the learning achievement of the knowledge aspects and attitude aspects of the subject matter of the buffer solution. Whereas the skills aspect was not influenced on the e-learning (edmodo) blended learning model. It could be seen from the price of significance on the results of the Independent sample t-test (aspects of skills and attitudes) and the crucial wallis test (aspects of knowledge). The significance of the aspect of knowledge is 0,000 <0,05, the attitude aspect is 0,021 <0,05 and the skill aspect is 0,699> 0,05. The compatibility of the learning model with the material gives the experimental class higher than the control class. This could be seen from the average achievement of the experimental knowledge aspect (77.03) higher than the control class (70).

1. Introduction
Education is an essential aspect for nation building as its role in creating and developing character of a nation. It is an effort to achieve the education purposes which is to carry knowledge or ideas, concepts, attitudes, or new habits [1]. Learning development can be authored by methods upgrading. Teachers should improve the methods used based on the teaching and learning condition following the applied curriculum. Moreover, the choice of methods, models, materials and strategies should be matched with the learning current needs.

An observation has been implemented in the learning process of SMA in Boyolali district. The result shows that the learning process in the school implementing group discussion as the method and utilizing power point as the media. However, in general, teachers mostly use speech method in the teaching process. Speech method proves that it makes students feel bored in the class and they slowly catch the materials given. As a result, the learning objective cannot be achieved optimally. That
method draws to passive students in classroom and teachers becoming one and only learning source. To conclude, it leads to students’ low learning achievement.

Globalization brings positive effects of technology for education sector. Learning sources can be enriched by the using of technology such as internet, computer, telephone, etc. Students who have distance education which learning process can be conducted anywhere and anytime. They can learn with the ways they likely to learn. Blended learning is one of efforts to increase students’ achievement in which they integrate face-to-face and online learning[2].

Blended Learning is a teaching model which combines face-to-face learning with computer-based learning[3]. The main purpose of this method is to facilitate independent learning activities in accordance with students’ characteristics. Blended Learning is not only useful for improving learning outcomes, but also improving teachers and students interaction in conventional learning environments, online learning, and learning which combines online face-to-face[4]. This learning strategy is applied in the learning process for several reasons: (1) enriching learning management, (2) facilitating access to knowledge, (3) increasing learning interactions, (4) personal agency, (5) cost effectiveness, and (6) revising teaching material in ease[4]. The syntax of Blended Learning model includes: (1) presenting information; (2) guiding the learner; (3) practicing; and (4) assessing learning[5].

The implementation of Blended Learning is supported by E-Learning. E-learning is created to support online learning process[6]. It helps students getting material without having face-to-face in classroom with teachers; instead they can set the learning process and aces knowledge as they want both in campus and at home. The learning process is no longer only listening to material description from teachers. Nowadays, teaching material can be visualized in a variety, dynamic and interactive forms (files, videos, music, animations, etc.)[7]. Additionally, the implementation of E-learning in learning process has succeeded in increasing students learning achievement[8].

Buffer solution is a chemistry subject for XI grade in even semester 2013 curriculum in which students will learn concepts, types, working principles, pH, and roles of buffer solutions in daily life. This material requires understanding and mastery of initial concepts of calculation and a strong theoretical basis of acid-base compounds, and the degree of acidity (pH) of acid-base as a prerequisite. In addition, students faced deal with concept of salt hydrolysis which is often misleading if presented simultaneously.

In its application, students are provided with files of material that can be accessed offline accompanied by the application of a virtual class Edmodo for sharing various files to be presented and gathering assignments[3]. The purpose of applying this learning model is for students having preliminary understanding related to materials and be able to utilize online, offline or face-to-face learning media. Moreover, the limited time provided requires students to be more active in gathering information related to learning goals.

Mugenyi Justice Kintu, Chang Zhu and Edmond Kagambe’s research stated that the results of multiple regression analysis showed that the blended learning design features (quality of technology, online tools and face-to-face support) and student characteristics (attitudes and self-regulation) predict student satisfaction as an outcome[9]. Research by Saovapa Wichadee, Bangkok University, Bangkok, Thailand shows that blended learning is more effective than traditional learning[10].

In this case, learning strategies which help students knowing earlier materials to be learned in class is needed as they will be better prepared and helped in terms of increasing their learning achievement. Based on those phenomena so the research study of The Effect of Using Blended Learning Edmodo on Students Learning Achievement on Buffer Solution Material at the Grade XI MIPA SMA Negeri 1 Banyudono in the Academic Year 2018/2019 is important to be done.

2. Research methods
This quasi experimental study implemented quantitative as its approach. The sample was divided into 2 groups, 1 experimental class which applied Blended Learning model supported by e-learning (edmodo), and 1 control class which applied lectures and discussions as the teaching and learning methods.
The subjects of this study were students of grade XI MIPA SMA in Boyolali district the academic year 2018/2019 which consists of 3 classes. Those samples were tested for normality and homogeneity to determine the class to be used in the study.

Data collection techniques used were test and non-test (questionnaire, observation, and documentation). The tests were used for knowledge aspects achievement, while non-tests (questionnaire and observation) were used for attitude and skills aspects achievement. The data analysis technique applied the Independent Sample T-Test which required normal and homogeneous data. In order to test whether the sample is from a normal distribution population or not, the Shapiro Wilk test is utilized. While to find out whether the samples have homogeneous or inhomogeneous variations, the Levene Test was implemented. If the data are not normal or not homogeneous, the data analysis used is the Krusikal Wallis test.

3. Results and discussion

The data obtained on this study are student achievement in the material of buffer solution including knowledge, attitude and skills aspects. Table 1 shows the students’ learning achievement.

| Class     | Average Score | Knowledge | Attitudes | Skills |
|-----------|---------------|-----------|-----------|--------|
| Experimental | 77.03         | 3.92      | 2.98      |
| Control    | 70            | 3.89      | 2.94      |

The normality test performed by Shapiro-Wilk test is at a significance level 5%. The results of the normality test are summarized in Table 2. The homogeneity test carried out by Levene Test is also at a significance level 5%. The summary of homogeneity test results is in Table 3. Based on Table 2 and Table 3, the results of research data for knowledge aspects are not normal and not homogeneous, while the attitude and skills aspects of data are normally distributed and homogeneous. Therefore, the attitude and skills aspects data meet the requirements of Independent Sample T-Test, while the knowledge aspect data, performed by Krusikal Wallis test, does not meet normal and homogeneous requirements. The Independent Sample T-Test results are found in Tables 4 and 5 while the Krusikal Wallis test results are in Table 6.

| Class  | A     | Knowledge (Pre-Test) | Knowledge (Post Test) | Attitudes | Skills |
|--------|-------|----------------------|-----------------------|-----------|--------|
|        |       | Sig. summary | Sig. summary | Sig. summary | Sig. summary |
| Experimental | 0.05 | 0.172 | Normal | Not Normal | 0.980 | Normal |
| Control  | 0.05 | 0.004 | Not Normal | Not Normal | 0.490 | Normal |

| Homogeneity Test | A | Knowledge | Attitudes | Skills |
|------------------|---|-----------|-----------|--------|
| Sig. summary | Sig. Summary | Sig. summary |
| Homogeneity in terms of learning model | 0.05 | 0.001 | Not Homogeneous | 0.859 | Homogeneous |

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There are differences in the influence of learning models on learning achievement. The attitude aspect significance is smaller than $\alpha$ that is $0.021 < 0.05$. There is influence from Blended Learning models supported by e-learning (edmodo) on attitudes learning achievement aspects taken from the results obtained in the experimental class. There is no effect of the learning model on learning achievement. The skills aspect significance is greater than $\alpha$ that is $0.699 > 0.05$. There is no influence of Blended Learning model supported by e-learning on the learning achievement of the skills aspects. There are differences in the effect of learning models on learning achievement. The knowledge aspect significance is smaller than $\alpha$, that is $0.000 < 0.05$. There is influence of Blended Learning models supported by e-learning on learning achievement of knowledge aspect.

Generally, the learning process in the experimental class and the control class went well and the achievement in the experimental class increased. The syntax of Blended Learning are: 1) Presenting Information: students are given material via e-learning (edmodo). It helps students better prepared before accepting learning material in classroom. 2) Guiding the Learner: students discussing the material. The teacher reviews the results of the discussion and concludes the learning material, then reviews the results of the task again through e-learning (edmodo) at anytime and anywhere. 3) Practicing: students are given tasks in the form of worksheets in each meeting. 4) Assessing Learning: students are given a pre-test to measure students’ initial material about the buffer liquid, and post-test to measure the students’ understanding.

The use of Blended Learning model gives an influence on students’ learning achievement rather than lecture method seen from knowledge and attitude aspects. It can be seen that there is a significant difference between the control class and the experimental class. In this case the Blended Learning model emphasizes conventional learning assisted by e-learning. Therefore, students can review the learning material so that they can have much better understanding about the material. In addition, students must also be as quick and as good as possible in completing the given task because the teacher often gives limited time for the tasks collection. By doing so, the students can be more independent and disciplined in the learning process. However, there is no influence of Blended Learning models in terms of skill aspects. There is no significant difference in the effect of the learning model used.

Whereas in the lecture method, learning takes place in one direction as the researcher only explains the material buffer solution then gives questions to be worked on by students. In this case, students are not motivated in understanding the materials; the learning process seems monotonous and makes the students passive.

4. Conclusion
There was the influence of the blended learning model supported by e-learning toward students’ learning achievement in terms of knowledge and attitude aspects on the material buffer liquid. This learning model has no influence on skill aspects. The average score of knowledge aspects achievement from the experimental class is 77.03 better than the control class’ which is only 70. The average score of attitude aspects achievement from the experimental class is 3.92 not far from the control class’
which is 3.89. The average score of skill aspects achievement from the experimental class is 2.98 while the control class’ is 2.94.

References

[1] Mardliyana, E., dkk., 2018, JGE, 4(1),19-30.
[2] Ramadan, A. R., & Basuki, I., 2018, JPTE, 7(2),193-200.
[3] Rahman, M. M., 2017, Pengaruh Strategi Pembelajaran Berbasis Blended Learning dan Efikasi diri terhadap Kemenarikan dan Hasil Belajar Mahasiswa Program Studi Magister Pendidikan Olahraga Universitas Negeri Malang, Thesis, Universitas Negeri Malang.
[4] Osguthorpe, R. T., & Graham, C. R., 2003, TQRDE., 4, 227-233.
[5] Husamah., 2014, Pembelajaran bauran (Blended Learning), Jakarta: Prestasi Pustakarya.
[6] Allen, M., 2013, Michael Allen’s Guide to E-Learning, Candra, John Wiley &Sons.
[7] Ruli, E., 2009, Multimedia Learning Prinsip-prinsip, Aplikasi dan Tiga Asumsi Teori Kognitif Multimedia Learning, Yogyakarta: Pustaka Pelajar.
[8] Ali, M., 2007, Guru dalam Proses Belajar Mengajar, Bandung: Sinar Baru Algesindo.
[9] Kintu, M. J., Zhu, C., Kagambe, E. 2017. International Journal of Educational Technology in Higher Education. 14/7.
[10] Wichadee, S., Orawiwatnakul, W. 2017. International Journal of Instruction. 10/1.