KELAS KITA BASED BLENDED LEARNING: BIOLOGY LEARNING MODEL TO IMPROVE STUDENT ACTIVITIES, ATTITUDES, AND ACHIEVEMENTS

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Abstrak. Di era perkembangan teknologi sekarang ini, arus informasi dan ilmu pengetahuan sangat cepat ter*update* sehingga dibutuhkan fasilitas untuk mengimbanginya khususnya di bidang pendidikan. Model pembelajaran konvensional sangat mendukung untuk interaksi antara guru dan murid namun disisi lain model ini kurang mampu memberikan fasilitas berupa akses informasi kapanpun dan dimanapun. Kelemahan tersebut dapat diatasi oleh pembelajaran online sehingga muncul solusi pembelajaran *blended learning,* dimana tetap mempertimbangkan interaksi guru dan murid serta memperluas kesempatan pembelajaran karena tidak terbatas pada waktu dan tempat. Penelitian ini bertujuan untuk mengetahui efektivitas pembelajaran blended learning berbasis situs jejaring kelas kita dalam meningkatkan prestasi belajar, aktifitas dan sikap belajar siswa. Subjek penelitian ini adalah siswa MA yang berjumlah 2 kelas (kelas eksperimen 33 siswa dan kelas control 34 siswa) di Cirebon, Indonesia. pada materi perubahan lingkungan. Desain penelitian menggunakan *Pretest-Postest control group.* Teknik pengumpulan data menggunakan observasi, tes dan kuesioner. Dari hasil penelitian memberikan informasi bahwa kelas eksprimen yang diterapkan model pembelajaran blended learning memiliki prestasi, aktifitas dan sikap belajar yang berbeda secara signifikan (sig<0,05) dari kelas kontrol. Para siswa memiliki sikap antusias karena diberikan kesempatan untuk mengeksplore potensi diri dalam mengkaji literatur berbasis jejaring kelas kita. Implikasi dari penelitian ini adalah model pembelajaran blended learning dapat dikembangkan dan diterapkan pada materi lain bahkan di matapelajaran lainnya.
Kata Kunci: *Blended learning*, model pembelajaran, prestasi belajar, aktifitas belajar.

Abstract. In the current era of technological development, the flow of information and knowledge is very quickly updated, so that facilities are needed to compensate, especially in the field of education. Conventional learning models can support interactions between teachers and students, but on the other hand, this model is less able to provide facilities in the form of access to information anytime and anywhere. These weaknesses can be overcome by online learning, so that a blended learning solution appears, which still considers the interaction of teachers and students and expands learning opportunities because it is not limited to time and place. This study aimed to determine the effectiveness of blended learning based on *kelas kita* network sites in improving student achievement, activities, and learning attitudes. The subjects of this study were two classes of MA students (experimental class of 33 students and control class of 34 students) in Cirebon, Indonesia. The biological material chosen in this study was environmental change. The study design used a Pretest-Posttest control group. Data collection techniques employed observation, tests, and questionnaires. From the results of the study, it provides information that the experimental class applied blended learning model had significantly different achievements, activities, and learning attitudes (sig <0.05) compared to the control class. Students had an enthusiastic attitude because they were given the opportunity to explore their potential in studying literature based on *kelas kita* network. The implication of this research is that a blended learning model can be developed and applied to other materials, even in other subjects.
Keywords: Blended learning, learning models, learning achievement, learning activities.

INTRODUCTION

The 21st century is an era of globalization, where information and communication technology (ICT) is developing very rapidly (Burkhardt et al., 2003; Griffin et al., 2012; A S Shidiq & Yamtinah, 2019). ICT is currently one of the most dominant sectors in daily life. Information technology plays a lot in daily life, including personal needs, company, education, etc. (Daud & Arini, 2015; Dey & Bandyopadhyay, 2019). One of the impacts felt in the world of education is the shift in learning systems from conventional to more open education utilizing ICT. The role of technology in the education sector are included as a part of the curriculum, as an instructional delivery system, as a means of aiding instructions and also as a tool to enhance the entire learning process (Ndlovu & Mostert, 2018; Niess, 2005; Raja & Nagasubramani, 2018; Yamtinah, et al., 2017).

Technology and information that are experiencing very rapid development help learning activities in the 21st-century era, namely as a provider of information and various other facilities (Barak, 2017; Chen & Jones, 2007). One of the most popular in the world of education today is the use of the internet for learning resources. The internet makes it easy for users to access information whenever and wherever they are. The use of the internet in the world of education is indeed beneficial, but the sources used as learning material by students are usually unstructured and lacking direction (Warnajith et al., 2012).

The development of technology indirectly requires students always to follow the trend, one of which is to have a smartphone (Hardinata, et al., 2018; Kranz, et al., 2013). As of now, the use of smartphones has become a necessity in everyday life (Shidiq, et al., 2020). The use of smartphones among students is usually only used to play music, access videos, play games, and access various other social media to communicate. Kazua & Mehmet (2014) stated that the development of ICT, which has many benefits, has not been utilized optimally in the learning process.

Many studies have been carried out on the use of smartphones as educational technology that are utilized as an interesting and fun learning media when filled with an application and educational content (Ada, 2018; Cahyana, et al., 2017; Montrieux, et al., 2015). Today's technology-based learning applications have contributed to various advancements in the world of education. Through learning media packaged in smartphones, it makes students easy to interpret data, increase understanding, compact information, present data, arouse motivation and interest of students in learning, so that they not only listen to explanations from the teacher but through learning media, they can also make more observations and demonstrations (Sudjana & Rivai, 2011; Tee et al., 2018). Development of media in the form of mobile learning is able to meet the criteria of support for the objectives and content of learning, conformity with student characteristics, the efficiency of learning time, and easy to use by students (Ibrahim & Ishartiwi, 2017; Nuzulia, et al., 2017, Nursamsu, et al., 2020)

It was found in the school environment of MAN 1 Cirebon City that the use of facilities, such as electronics, both laptops, and smartphones, was not optimal in learning. Teachers had difficulty in developing learning media, and the learning resources only came from textbooks. The same learning models and methods were always used by the teachers there so that students did not feel motivated to learn because they got bored easily (Paramita, et al., 2019). Whereas, in the current era, conventional learning activities can already be combined with online learning, for example, in the provision of material, assignments, and even evaluations. Ogunleye (2010) found that online learning effectively facilitated collaborative and cooperative learning among students that served to keep student interest and understanding of course material. The emergence of various types of educational-based applications that can be downloaded on smartphones is something that affects the progress of learning. Today's students are 90s generation students, and students in the

current era are known as native digital, where they were born in the computer era, grew up in the internet era, and using smartphones every day (Chee, et al., 2018), so they will tend to accept this information technology easily to improve learning naturally (Putri, et al., 2019).

Technology-oriented learning in the 21st century has a positive impact on the world of education, namely the emergence of alternative sources of learning and new learning media. Learning that used only to be done conventionally in the classroom with the lecture method can now be done on an online basis (Care & Griffin, 2015; Griffin et al., 2012; Trilling & Fadel, 2009). Online learning is the implementation of teaching and learning that is thoroughly carried out with the help of ICT and does not require face-to-face activities; in this learning, students can learn from anywhere and can be done directly or indirectly without space and time (Anderson & Elloumi, 2005). Another problem that arises in such a learning system is the erosion of the process of interaction between students and students, students and teachers, and their environment. Kazua & Mehmet (2014) said that to overcome the social interactions encountered in technology-based learning, it is to keep mixing traditional learning with online learning. From this point of view, a blended learning model can be the right solution in technology-based learning. The learning process is known as blended learning. Blended learning focuses on student-centered, where students are required to be active in understanding the material (Chatterjee & Kothari, 2015; Faour, et al., 2012; Prihadi, 2012). This learning model is very efficient in terms of time and place because it is not limited to doing in the classroom but can also be done at home. Blended learning offers more flexibility in terms of time, place, and variety of learning methods compared to online and face to face methods (Boelens, et al., 2017). Analysis of the findings from Means, et al. (2013) indicates that blended approaches have been more effective than pure online learning and face-to-face instruction.

In overcoming the problems that exist in MAN 1 Cirebon, research related to the effectiveness of the blended learning model of student learning achievement and student learning activities needs to be done. The use of learning models in principle is to help and facilitate teachers in delivering material in class to students, so students can more easily understand the material delivered by the teacher by utilizing a learning model. The blended learning model can be a solution to overcome the problem of time allocation and more varied learning resources (Ho, et al., 2016). This internet-based learning model can make students more controlled by the teacher both in terms of material and learning. In the implementation of blended learning, *kelas kita* social networking sites can be employed. *Kelas kita* site is an education-based social media that has a role in making it easier for teachers to create and take classes online. *Kelas kita* social media sites, like other social media sites, provide features, and users can gather as many friends as possible. *Kelas kita* application has complete features to support online learning needs, some of the features contained in *kelas kita* applications include text, video, audio, tests, assignments, and quiz features, which are indeed very exciting during the learning process. The various advantages that can be provided by the application of blended learning and *kelas kita* application give rise to a research opportunity. Therefore, this study aimed to apply *kelas kita*-based blended learning model to improve student activity, learning, and achievement. By doing this research, it is hoped that it can give an idea of the effectiveness of the application of *kelas kita*-based blended learning model. Besides, this research is also expected to contribute as an alternative choice of learning models for biology teachers in the 21st-century era.

METHOD

This study used a quantitative approach with the research design of the pretest-posttest control group design. The population in this study was all students of class X MIPA in MAN 1 Kota Cirebon, Indonesia, totaling 164 students. The sample of this research was 67 students, consisting of 33 students as the experimental class (class X MIPA one) and 34 students as the control class (class X MIPA three). The biological material chosen in this study was environmental change. In this study, the control class used had homogeneous conditions with the experimental class, as evidenced by the homogeneity test. Data collection techniques in this study employed several methods, namely; (1) observation of student learning activities during learning using the observation sheet instrument; (2) learning achievement tests on environmental change material using 40 multiple choice questions instruments; and (3) attitude questionnaire towards network site of *kelas kita*-based blended learning using Likert scale questionnaire sheets. The data analysis technique utilized was the analysis of student achievement between before and after treatment in learning. A different test from the N-gain data was carried out using Mann Whitney, and the prerequisite test analysis was the normality test (Shapiro Wilk) and homogeneity test. All three tests utilized the SPSS 20.0 program.

RESULTS AND DISCUSSION

Improvement of Student Learning Achievement

The difference in the improvement of student learning outcomes between classes that applied *kelas kita*-based blended learning models and classes that did not apply the model can be known through the pretest and posttest scores. From Figure 1, it can be identified that both classes experienced an increase in learning achievement at the second meeting compared to the previous meeting. At the beginning of taking the pretest score, where all students have not gotten material about environmental changes, both the experimental and control classes had average scores that tended to be the same. Even the control class was slightly higher than the experimental class. When learning has taken place, and students were given a post-test problem, the average score of the experimental class was much higher than the control class with a large enough difference.
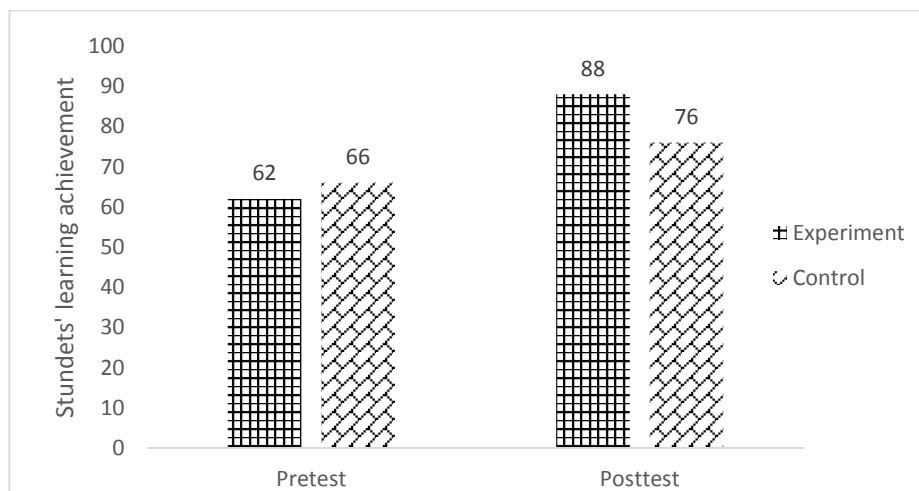

Figure 1. Average pretest-posttest scores of two classes

Based on the N-Gain data of the results of the pretest and posttest in the experimental classes that applied *kelas kita*-based blended learning model and the control class that did not apply the learning model in Figure 2, it is found that there was an increase in high category learning achievement for the experimental class and the moderate category for the control class. There was a big difference in the score of N-Gain between the experimental class and the control class due to differences in models and media used in classroom learning. The experimental class was more lively, fun, and attracted students' attention by using smartphones during learning, where both the source of the material and the method of delivery were very varied. The presence of mobile learning using devices, such as smartphones, was able to support the concept of lifelong education. The nature of mobile learning, which is based on open source, makes everyone can develop and use it according to the wants and needs of learning (Belina & Batubara, 2013). Learning via smartphone is done virtually so that it can be accessed from anywhere, by providing access to all different learning materials and providing content sharing for each user by using the same content, and allowing instant feedback (Ibrahim & Ishartiwi, 2017; Meishar-Tal & Gross, 2014; Ristina, et al., 2020).
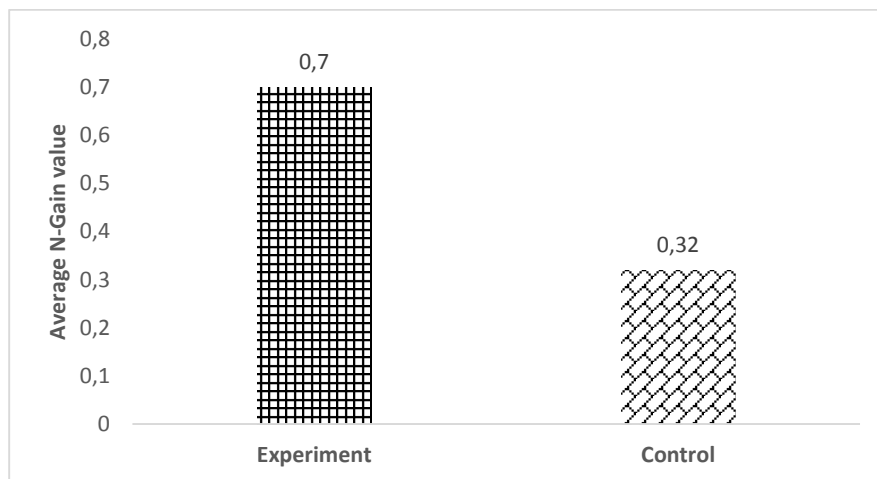

Figure 2. The average total N-Gain test values between pretest and posttest of student learning achievement

The difference in the improvement of student learning outcomes between the experimental class and the control class was followed up by a different test. However, beforehand, the normality test and homogeneity test were first performed to find out whether the data were normally distributed and homogeneous or not. The results of the prerequisite test and the difference test of the difference in the learning outcomes of the experimental class and the control class are explained in Table 1. The normality test conducted in the data processing and analysis process was carried out using the Shapiro Wilk test. Based on the N-Gain normality test results of the experimental class, it showed that the data were normally distributed because the significant value of 0.168 was greater than 0.05, while the control class showed the value of sig., which was smaller than 0.05, so the data were not normally distributed. In the second prerequisite test, the homogeneity test of the two classes showed homogeneous data because the Sig value was higher than 0.05. Because the prerequisite tests in the control class were not met, the different test performed was the non-parametric Mann Whitney Test. The results of the Mann Whitney Test were that both classes had differences in learning achievement improvement. Differences in student learning outcomes between classes that applied *kelas kita*-based

blended learning model and the classes that did not apply the learning model were shown through the N-Gain values that had been recapitulated from the results of the pretest and posttest. The application of *kelas kita*-based blended learning model could improve student learning achievement.

The learning process in the experimental class used a blended learning model. This type of learning model is a learning model that involves e-learning media. The blended learning model involves two types of learning in it, namely conventional learning and learning involving e-learning. The term blended learning is learning that combines all forms of learning, for example, online, live, and face-to-face (conventional) (Kintu, et al., 2017; Pevac, et al., 2005). Based on the opinion of Chen & Jones (2007), a wide range of research studies have found that the blended learning approach had positive effects on student achievement. Students prefer blended learning over traditional learning because blended learning helps improve learning and teaching (Alsalhi, et al., 2019; Dowling, et al., 2013). Implementing a blended learning strategy can improve learning independence and critical thinking abilities and can improve learning achievement (Nazarenko, 2015; Porter, et al., 2014; Puspitasari & Nugroho, 2020; Sari, 2013).

Table 1. Results of prerequisite tests and tests of difference in the experimental and control classes.

Data	Class	Normality Test		Homogeneity Test		Difference Test	
		Sig.	Explanation	Sig.	Explanation	Sig.	Explanation
Gain	Experiment	0,168	Normal	0,134	Homogeneous	0,000	There is a difference
	Control	0,012	Not Normal				

Learning in the experimental class using the blended learning model during the two meetings took place effectively, although, at the beginning of the meeting, it experienced a few obstacles in the application of the media to be used. It was because students had never been identified with blended learning that was collaborating with conventional models with the use of media or technologies that were e-learning. At the beginning of the student meeting in the experimental class, there were still few difficulties and obstacles in opening *kelas kita* account, but because the blended learning model had a cooperative learning stage, the learning activities of students in the classroom returned conducive. Blended learning model has eight stages starting from prepare me, tell me, show me, let me, coach me, connect me, support me, and check me. This learning model is online based on e-learning, marked by the distribution of learning materials online. E-learning is short for electronic learning. One common definition of e-learning is the delivery of learning material through electronic media, such as the internet, intranet/extranet, satellite broadcast, audio/videotape, interactive TV, CD-ROM, and computer-based training (CBT) (Hay, et al., 2010; Khlaisang & Koraneekij, 2019). The use of technology provides added value or advantages in learning in the classroom (Ajilore & Mphahlele, 2013; Costa, et al., 2012). Kagohara et al. (2010) claimed that using Technology- multimedia such as video, Encarta encyclopedia, simulation software, and dry science labs, may offer advantages over textbooks, especially for complex scientific topics and difficult concepts that are unfamiliar to students.

Improvement of Student Learning Activities

There were five indicators of student learning activities observed in this study. Student learning activities that were observed included group cooperation, asking or answering questions, literacy studies, or using *kelas kita* social networking sites in learning,

presenting the results of discussions, and concluding the material concepts after learning. Based on the results of observations made during the study, there was an increase in student learning activities in the first meeting to the second meeting, both student learning activities in the control class and the experimental class. Figure 3 presents the percentage of the average value of the learning activities of the control class and the experimental class in the first meeting to the second meeting. The increase in student learning activities in the experimental class was by 15% from the first meeting to the second meeting, while the learning activities of students in the control class increased by 14% from the first meeting to the second meeting. The experimental class and the control class experienced an increase in learning activities, but the highest increase was found in the experimental class. Based on Figure 3, it is seen an increase in the percentage of student learning activities in the experimental class, increased from good criteria to very good with a final percentage of 88%. Meanwhile, the increase in student learning activities in the control class remained stable in good criteria, with a final percentage of 79%. A large percentage in each class was derived from the acquisition of the value given by the observer to students as the value of student learning activities during learning activities in the classroom.
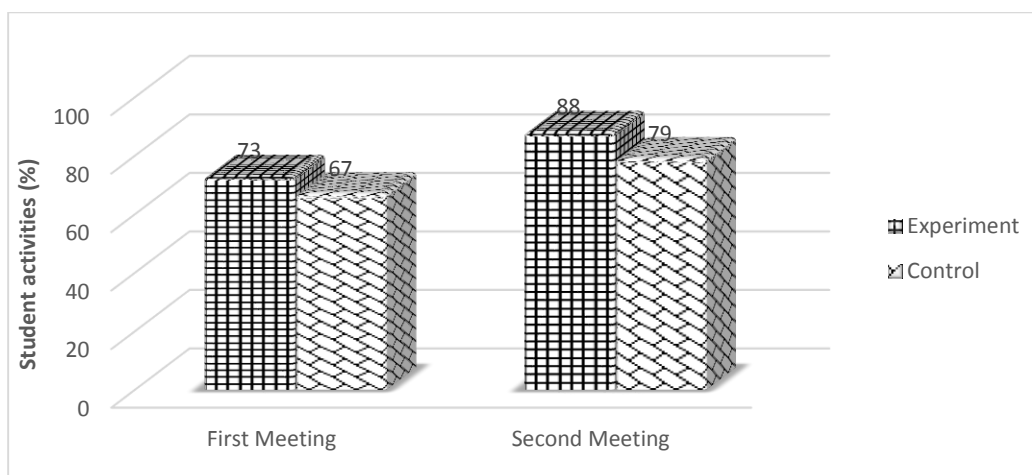

Figure 3. Differences in the students' activities of the experimental and control class

Student learning activities during the learning process that was taking place from the first meeting to the second meeting showed an increase in each indicator, as seen in Figure 4. There were differences in scores obtained, where these differences determined how much improvement was obtained by each indicator of student learning activities during the research process took place. Scores obtained at the first meeting of each indicator tended to be low and increased at the second meeting. The experimental class has increased with a total percentage of 71%. Meanwhile, an increase in the percentage of student learning activities in the control class was 60%. Based on the results of the analysis of these data, it can be concluded that the increase in the score of student learning activities in the experimental class was higher than in the control class. Criteria for student learning activities in the experimental class showed very good criteria, while the criteria for student learning activities in the control class showed quite good criteria.

At the first meeting of the five indicators, the highest value of student learning activities in the experimental class was in indicators one and three, namely group cooperation and literacy studies or using *kelas kita* social networking sites in the learning process. Meanwhile, the lowest value was on indicator five, which was to conclude the

concept of material after learning. The high value of indicators one and three at the first meeting in the experimental class showed that students had started to be enthusiastic in following the learning process. It is the enthusiasm that arose from these students that would encourage them to always participate in each learning process that took place. One of the factors that influenced enthusiasm was instructional material. The instructional material the teacher uses in learning speaking skills really impacts the students' enthusiasm (Nur, 2019), where the more familiar and suitable with the lives and interests of students, the more enthusiastic students are in learning. In this study, during the learning process, students were involved with their respective smartphones that were very closely related to student life. It gave a different impression for students in following the learning process in the classroom.
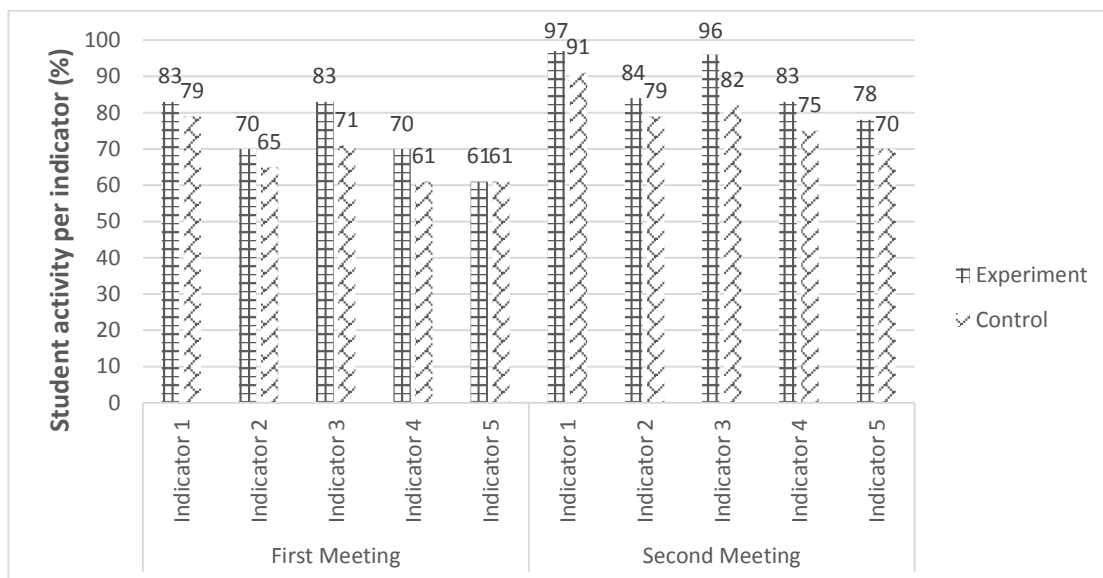

Figure 4. Recapitulation of student learning activity indicators

Indicator description: (1) group collaboration; (2) asking or answering questions; (3) literacy studies or using *kelas kita* social networking in learning; (4) presenting the results of the discussion; and (5) concluding the concept of material after learning. The application of *kelas kita*-based blended learning model has been shown to influence the increase in student learning activities due to the experimental class learning activities that were higher than the control class. In *kelas kita*-based blended learning model, the teacher helped in improving students' psychomotor aspects. During the learning process took place, students were in groups, and each student used a smartphone to access the subject matter to be learned on that day. Student worksheets that must be pre-filled had been uploaded to *kelas kita* social networking site so that students simply downloaded and filled them out. Likewise, with the learning videos, each student could see directly through their smartphones.

Student learning activities in the experimental class that applied *kelas kita*-based blended learning model demanded and made students active in finding information. Students became often asking, even though the question was not just about the subject matter being studied. Students became more active in working together between groups. Although each student was busy with their own smartphone, but it was used to learn by opening the subject matter uploaded online to the account. During the learning process, students were active in discussing with their group mates. Each group discussed in solving

some of the questions that must be done in a student worksheet (LKS), which previously had to be downloaded first. After completing the worksheets, the students from each group came to the front of the class to present the results of their discussion. At that stage, students were enthusiastic about delivering the results of the discussion. In contrast, for the control class that did not involve e-learning media, where learning resources only came from books and worksheets, the learning activities of students were only discussing and working on the problems contained in the worksheets. The interest and motivation of students from the control class appeared to be less developed because they were easily bored. It was very different from experimental class students who appeared to have a high interest and motivation in the learning process. A good and appropriate learning process will motivate learners and will eventually have an impact on improved learning outcomes (Sardiman, 2011; Shidiq, 2016; Triarisanti & Purnawarman, 2019).

Kelas kita-based blended learning model relies on e-learning-based media so that students can learn unlimited space and time, and then, students will increasingly understand more about the material learned in the classroom. Syarif (2012) stated in his research that blended learning is a flexible approach to designing programs that support a mixture of different times and places for learning. The blended learning model is basically a combination of learning excellence that is done face-to-face (face to face learning) and virtually (e-learning) (Hurlbut, 2018). Online learning or e-learning in blended learning becomes a natural extension of traditional classroom learning using face-to-face learning (Boelens, et al., 2017; Hilliard, 2015). Through the blended learning model, the learning process is more effective because the conventional teaching and learning process will be assisted with e-learning learning, which in this case, stands on the information technology infrastructure and can be done anytime and anywhere. Terras, et al. (2012) reported that blended instruction was perceived as an effective method for learning among teacher education students in the areas of meeting course objectives, involvement of the course instructor, media elements, and overall learning experience.

Data collection of student attitudes toward the application of *kelas kita*-based blended learning model in this study used a questionnaire sheet with a Likert scale with five alternative answers, including SS (strongly agree), S (agree), R (doubtful), TS (disagree), and STS (Strongly disagree). The recapitulation results from student attitude assessment data towards *kelas kita*-based blended learning model obtained from the questionnaire assessment sheet are shown in Figure 5. Based on Figure 5, the responses of 33 students' attitudes towards the application of *kelas kita*-based blended learning model tended to have strong and very strong categories, while the categories weak and very weak had a value of 0%.
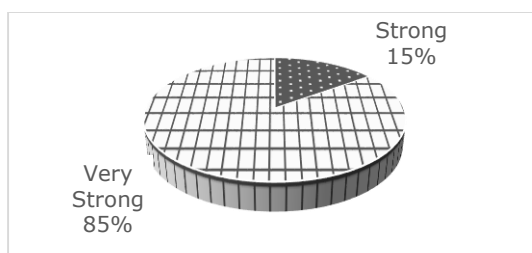

Figure 5. Percentage of students' attitudes toward the application of *kelas kita*-based blended learning model

The average student attitudes of the 20 questionnaire statements were 85% strong, which means that students' attitudes toward the application of *kelas kita*-based blended learning model on the subject of environmental change were positive. Positive responses could be seen when students were happy and enthusiastic about the lesson so that students

could understand the material presented by the teacher. It affected student learning outcomes to be increased compared to before. Positive responses raised by students were usually caused by the atmosphere in the classroom, whether the atmosphere in the classroom was fun or boring. Valeriu (2015) revealed that one of the factors that influenced students' positive responses to learning was the teacher's teaching style in creating a comfortable learning atmosphere.

The application of *kelas kita*-based blended learning model that was used in the classroom as a medium for student learning elicited various student responses. Some students showed a happy and enthusiastic attitude in participating in learning in the classroom; some students just stayed quiet and were lazy to follow the lesson. It could also be caused by several factors from their own students, namely because students were lazy to learn, quickly got bored, and uninterested, also because lessons in the class did not appeal to students (Indit, 2012). However, during the two meetings in the experimental class, the average student showed a good response, namely following the learning with enthusiasm. Trianto (2013) argues that effective learning begins with a student-centered learning environment; the teaching must be centered on how students use their new knowledge. Based on this conceptual framework, there is a tendency today to return to the idea that students will learn better if the environment is created naturally. Learning will be more meaningful if students experience what they learn, not know it. A similar opinion is expressed by Kuswana (2012) that the learning environment is very influential in the way students learn. An environment that influences the way students learn includes physical, biological, socioeconomic, and cultural factors.

Student responses in learning are very important because, from the responses of these students, it can be found out whether the treatment given to students can be accepted or even rejected by students. If a student receives the treatment given during the learning process, it means he/she has a positive attitude towards the treatment. Conversely, if a student rejects the treatment given during the learning process, it means that he/she has a negative attitude towards the treatment given during the learning process. If students do not reject or reject, it means that they have a neutral attitude towards the treatment given in the learning process (Sukmadinata, 2012).

CONCLUSION

Based on the results of the study, it can be concluded that there were differences in the increase in student learning activities on indicators using *kelas kita* social networking sites during learning. Improved student learning outcomes of the experimental class were higher than the control class. It was evident from the N-Gain pretest, and posttest data was 0.70 in the high category for the experimental class and 0.32 in the medium category for the control class. Students gave positive responses from the aspects of the application (receiving), response (responding), and assessment (valuing) to the application of *kelas kita*-based blended learning model on the subject of environmental change. Overall, it can be concluded that the application of *kelas kita*-based blended learning model could significantly improve student achievement, activities, and learning attitudes (sig <0.05). Students had an enthusiastic attitude because they were given the opportunity to explore their potential in studying literature based on *kelas kita* network. The implication of this research is that a blended learning model can be developed and applied to other materials, even in other subjects.

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