The effectiveness of learning using social media to improve student's communication skills in fluids’ topics

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Abstract. This research aims at measuring the effectiveness of learning set using social media in improving students’ communication skills in the topic of fluids. This is experimental design research using One Group Pretest-Posttest, using a Project-based Learning model. This research is a part of Research and Development (R & D); the ADDIE learning set developed to consist of syllabus, lesson plan, materials, LKPD, test, and evaluation instruments. This research takes place in MTs. Negeri 1 Kota Gorontalo, using 25 students as the sample. The result of the data analysis shows that the average communication skill indicates a significant difference; the N-Gain is in high category of 0.72. Therefore, it can be concluded that the learning set using social media is effective to improve students’ communication skills in the topic of fluids.

1. Introduction

As one of the developing countries, Indonesia needs to educate its people as written in UUD 1945 regarding national development goals in education (fourth paragraphs of UU D 1945): “educating the nation’s people.” Therefore, education is a key to develop qualified human resources. Learning technology must get along with the rapid global development, makes teachers required to improve themselves in updating and utilizing learning technology according to the characteristic of the materials. The technology update is increasingly visible when it comes to digital industry revolution 4.0 that brings out changes in all aspects of life and their positive and negative effects. Generally, the revolution makes it easy to communicate using media and learning sources [1,2]. However, the revolution can also harm the morality of teenagers and students.

The result of observation and interview from some elementary and secondary school on January 22, 2017, regarding the usage of learning device and media shows some issues; a) the lack of learning media in physics and science course, b) the media is verbal, c) the students’ learning outcome is low, d) the discrepancy in the use of learning media and the subject characteristic, and e) some of the teachers do not pay attention to the usage of learning media. This research contributes solutions regarding the issues above; one of them is by giving suggestions on how to develop the learning media and what media to use in the learning process using social media. Therefore, social media is not only for social life but can also be used as a learning media. According to a study by [3], 98% of students have their own smartphone, and the features can be used learning physics and improve their learning outcomes.

Surveys by some researchers in September 2018 also discovered that 99.9% of students who have smartphones wasted their time in using social media only to chat with friends or killing times. The survey also found out that 86.67% of the students have social media accounts such as Facebook and WhatsApp, and 13.33% have Instagram, YouTube, and other social media accounts. Giving the fact that
social media is in their life, education should take part to become such innovation to support the learning process. The message, picture, video, document file features can be used in delivering the learning materials. Thus, research needs to be done with the aim of measuring the effectiveness of learning set using social media in improving students’ communication skills.

2. Methods
This is a research in the form of a one group pre-test and post-test design experiment, with a project-based learning model, and as a part of ADDIE Research and Development (R & D). The learning set consists of syllabus, lesson plan, materials, LKPD, communication skill test, and evaluation. The subject is 25 students of class VIII of MTs. Negeri 1 Kota Gorontalo.

3. Result and Discussion
The effectiveness of the learning set can be reached by analyzing students’ activities during the class and the result of the test for three meetings. The students’ activities and the result of the communication skill test are as follows:

3.1 The analysis of students’ activity
The activity is analyzed using average percentage formula of students’ activity [4], and the results are:

| Convergence | Percentage | Average  |
|-------------|------------|----------|
| I           | 81.02%     |          |
| II          | 84.22%     | 83.76%   |
| III         | 86.05%     |          |

According to table 1, the results of the activities for three consecutive meetings are 81.02%, 84.22%, and 86.05%. Therefore, the average percentage is 83.76% (good). The students’ activity being observed during the class is the students’ communication skill, divided into written and oral communication [5]. The indicator was initially based on research by [6], but then had been revised by suggestions from experts and practitioners in Forum Group Discussion (FGD), as well as from the advisors. Therefore, the written communication indicators are the structure, content, and development, while the oral communication indicators are presentation, content/information, coordination, and logic. There had been communication about a fluid topic (hydrostatic pressure, Pascal’s Law, and Archimedes Law), as well as the materials and LKPD, among students and teachers through social media groups before class. This group discussion was made to minimize the time spent and to give the students the opportunity to practice their communication skills.

3.2 Student’s communication test
The test was done using pre-test and post-test in the form of an essay given to 25 students. The result can be seen in table 2.

| No | Pre-Test | Post-Test |
|----|----------|-----------|
| 1  | 41       | 71        |
| 2  | 82       | 90        |
| 3  | 90       | 100       |
| 4  | 75       | 100       |
| 5  | 68       | 95        |
| 6  | 55       | 90        |
| 7  | 52       | 100       |
| 8  | 57       | 86        |
According to the table, the results are:

1. The achievement of minimum completeness
   The achievement of minimum completeness is analyzed using Classical Completenss Theory [7]. The analysis is aimed to know the percentage of students who achieve and do not achieve the minimum completeness. According to the table, those who achieve the minimum completeness (based on $KKM=75$) are 24 students, and only 1 that does not achieve it. Therefore, the percentage is 96%, which means that the learning media that had been used is effective. This corresponds to the research conducted by [3] claims that Android-based WhatsApp can be used to improve cognitive and learning motivation.

2. N-Gain Interpretation
   This interpretation aims to overview the improvement of students’ communication skills after the treatment using an innovative learning set (social media). The formula is based on research by [8].
Figure 1. The improvement of students’ communication skill

According to the picture, the N-Gain is in the category of normalized, with a high interpretation of 0.72. This result conforms the research saying that science communication skills can be improved through scaffolding during the learning process [9,10]. The improvement is possible because the students use written communication during the online activity (social media group) before and after the learning process. Written and oral communication is also used during material (fluid). In other words, students’ communication skills can be improved not only in classroom but also in online by using social media.

4. Conclusion
According to the analysis and discussion above, it can be concluded that innovative learning set using social media is effective to improve students’ communication skills about fluid topics and it can be used as an alternative way to teach other topics in science learning.

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