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STUDENTS' LEARNING INTEREST USING COMPUTER AND ANDROID MULTIMEDIA IN ACID-BASE TEACHING

Milanda Putri*, Yenni Kurniawati
Chemistry Education, Islamic State University of Sultan Syarif Kasim Pekanbaru, Riau, Indonesia

Abstract - This research is motivated by the influence of high technology on education; hence educators need to choose the right technology device to use and compare student learning interests with and without the support of computer and android multimedia. It was quasi-experiment research with posttest only and non-equivalent control group designs. The subjects of this research were the eleventh-grade students of Natural Science. There were 2 sample classes—the eleventh-grade students of Natural Science 3 (experiment I) taught using computer multimedia, and the students of Natural Science 1 (experiment II) taught using android multimedia. Interview with teachers, preliminary data test that was homogeneity test, final data test, learning interest questionnaire, interview, observation, and documentation were used to collect the data. The analysis result showed that the learning interest percentage of experiment I was 73.88% with the high category, and experiment II was 81.19% with the very high category. An independent t-test was used to see whether there was a significant difference between experiments I and II. It showed a significant difference in chemistry learning interest between students taught by using computer-based multimedia and those taught by using android-based multimedia on the acid-based lesson of chemistry subject at the eleventh grade of Natural Science. Therefore, Android-based learning could be developed in the learning process to support student chemistry learning interests.

Keywords: *Multimedia, Computer, Android, Learning Interest, Acid-Base*

INTRODUCTION

There are many problems and activities in everyday life that require chemistry as a solution, such as daily products that mostly utilize chemistry, ranging from polymer fuels, foodstuffs, cosmetics and, medicines. In everyday life, we cannot escape from chemistry. (Lina & Artina, 2017). The broad benefits of chemistry should make many human resources master chemistry. This phenomenon is inversely proportional, which can be seen from the low interest of students in studying chemistry. (Hemayanti, Muderawan, & Selamat, 2020). It is not uncommon for students to find it difficult to learn chemistry (Kurniawati, 2017) due to the weak interest of students.

Generally, students have a wrong view of chemistry, so they think that chemistry is a material that is not easy for them to learn and understand. The wrong view affects students' cognitive, affective, psychomotor and scientific processes. This wrong view affects the cognitive, affective, psychomotor and, scientific processes of students. (Harefa, Tafonao, & Hidar, 2020). Given this, chemistry materials should be delivered as attractive as possible and take advantage of increasingly developing technology as a medium to create productive, creative, innovative and effective and, student-centred learning by the current educational curriculum (Rochmani, Agustini, & Mitarlis, 2018). Interest is a sense of liking or interest in something that comes from within oneself without being told. Interest is accepting the relationship between something that is inside

*Corresponding author: Chemistry Education, Islamic State University of Sultan Syarif Kasim Pekanbaru, Riau, Indonesia. Email: milandaputri73@gmail.com

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and outside oneself. The stronger the relationship the greater the interest (Djali, 2011). Interest in learning is an important aspect of learning chemistry because it affects learning outcomes or objectives. Interest is the main capital to achieve goals; the greater the interest, the greater the opportunity to achieve the goal. Interest in learning will also affect learning achievement. (Rozikin, Amir, & Rohiat, 2018) (Khairiyah, Indrawati, & Haryana, 2018) and motivation to learn (Fauziah, Rosnaningsih, & Azhar, 2017).

Student interest in learning can be seen from several indicators of interest. The indicators of interest, according to Baharudin, are interest, awareness, and knowledge (Pasaribu, 2017). According to Slameto, indicators of interest in learning are interest, attention, motivation, and knowledge (Ratnasari, 2017), Meanwhile; according to Djamarah, indicators of interest in learning are liking/happiness, preferring statements, a sense of interest, awareness of learning, participating in the learning process, and paying attention (Syardiansah, 2016). In the learning process, interest in learning is influenced by various factors, namely internal factors and external factors. Internal factors or factors that come from students themselves include motivation, talent, and intelligence. Meanwhile, external factors or factors that are outside of students include teachers, family, social friends, and the environment/community (Fauziah et al., 2017). In connection with existing problems, it is necessary to make an effort to increase student interest in learning; learning based on Communication Technology (ICT) needs to be an important consideration for education managers to encourage the progress of the current era of information technology (Kurniawati, Wigati, & Hasri, 2021). Seeing the rapid development of technology and education can be used to attract students' interest in learning, especially in learning chemistry. Multimedia is the right answer to the problem of decreasing student interest in chemistry learning (Anugraheni, 2017)

Multimedia can be categorized into two, namely computer-based multimedia and Android-based multimedia. Computer-based multimedia learning is a combination of several media, including text, images, animation, audio, and video (Linda, Herdini, & Rahmaputri, 2017) and multimedia based on Android is a learning medium with an open-source operating system for mobile devices which is currently popular; therefore Android is chosen as an educational platform (Hamid, Santoso, & Widanarko, 2017). Based on this background, the researcher is interested in comparing the interests of students when learning is carried out with the two multimedia based on indicators of interest in learning. This research aims to analyze the best media for interest in learning chemistry with multimedia-based learning on computers and androids in one of the chemical materials which both have programs in the media used.

METHODS

This type of research is a quasi-experimental research with a Postest Only, Non-Equivalent Control Group Design research design according to Table 1.

Table 1. Research Design Post-test Only, Non-Equivalent Control Group

Class	*Pre-test*	Treatment	*Post-test*
Experiment I	-	X_1	T_1
Experiment II	-	X_2	T_2

This research was conducted on students of class XI IPA 1 and XI IPA 3 at SMA Negeri 8 Pekanbaru in semester 2 using the purposive sampling technique. This study's data collection techniques included questionnaire techniques, interview techniques, observation, and documentation. The questionnaire used was first validated by the supervisor and then tested in class XI IPA 2 followed by validity and reliability tests so that the questionnaire used was valid and reliable.

After the homogeneity and normality test, the hypothesis test is continued using quantitative descriptive analysis techniques. The data analysis technique used in this study was the parametric test using the independent t-test technique. In addition to statistical hypothesis testing, a descriptive analysis of students' interest in learning was also carried out by analyzing data on all items in the respondent's answer format in the questionnaire data which were given 5 alternative answers. Based on the test results, the data in this study were normally distributed. Then the data is presented with the formula:

$$P = \frac{F}{N} \times 100\%$$

Information:
P: The percentage number
F: Frequency (number of respondents' answers)
N: Number of the case (number of individuals)

Then the data is classified into quantitative data, which numbers can describe:

Table 2. Categorization Guidelines

No	Score Range	Category
1	0 % - 20%	Very Low
2	21% - 40%	Low
3	41% - 60%	Moderate
4	61% - 80%	High
5	81% - 100%	Very High

The categorization of student interests is based on the table above. The multimedia display used is as follows.

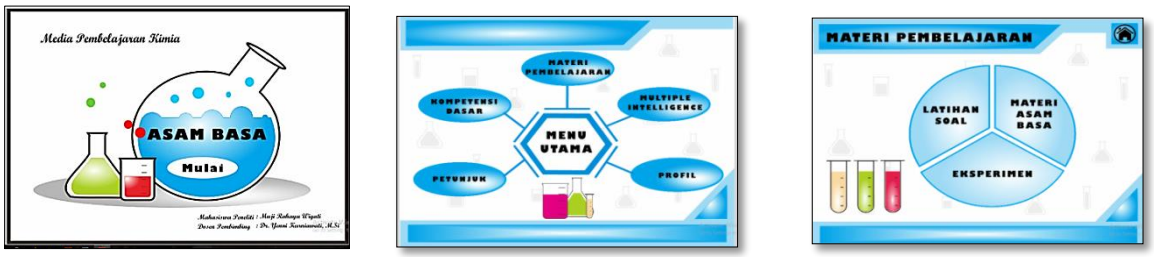

Figure 1. Computer Multimedia Display

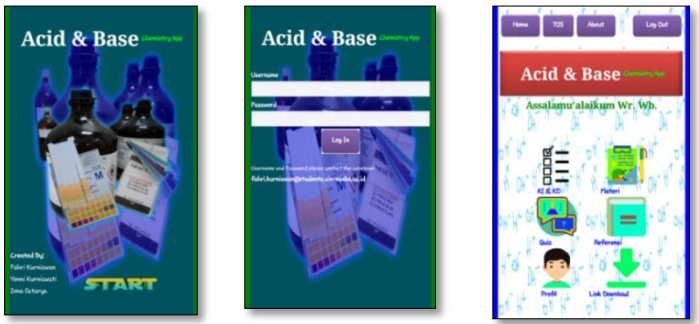

Figure 2. Android Multimedia Display

RESULTS AND DISCUSSION

The data obtained from this study were data from student interest in learning questionnaire which was analyzed using descriptive analysis techniques, based on the interest in learning questionnaire, data on the categorization of student interest in the experimental class II students and I were also obtained. Initial data analysis was conducted in class XI IPA 1 and class XI IPA 3. Then the data were also obtained from interviews with students who were used as supporters. The results of the initial data analysis can be seen in the following table:

Table 3. Sample Homogeneity Test Results

Kelas	Sig.	Asymp. sig	t_{count}	df	Sig.(2-*tailed*)
Experiment I	0.379	0,064	3,48	69	0,001
Experiment II		0,200			

Based on the table above, it can be seen that the significance value (Sig.) is 0.379. So 0.379 > 0.05, it can be concluded that the two samples come from populations with the same ability or are homogeneous. So that class XI IPA 3 was chosen as Experiment class I and class XI IPA 1 for Experiment class II. Furthermore, the normality test is carried out on the interest in learning questionnaire.

Based on the results of the analysis in the table above, it can be seen that the significance value for experimental class I is 0.064, and for the experimental class II is 0.200. It shows that the questionnaire data is normally distributed because the significance value of the two classes is greater than 0.05. It can be continued with the independent sample t-test.

Based on the calculation of the independent sample t-test in the table above, it is obtained t_{count} = 3,48 then determine the df using the n-2 formula, the sample in this study is 71 so that the price of df = 71-2 = 69. With df 69 at the 5% significance level obtained the price of t table = 1.667. Based on this value, it is found that the $t_{table} < t_{count}$ is 1.667 < 3,480 and the sig. (2-tailed) = 0.001 0.05 so that Ha is accepted and Ho is rejected. So, it can be concluded that there is a significant difference between student interest in learning with multimedia computer-based learning and Android on acid and base material.

Interest in Learning Experiment Class I

Based on the post-test questionnaire analysis of student learning interest, the percentage of student interest in the experimental class I was 73.88%, including the high category. The percentage of student interest in the experimental class I can be seen in Table 4.

Table 4. Percentage of Indicators of Learning Interest in Experiment Class I

Interest Indicator	Percentage
Interest	71,14
Awareness	75,62
Participation	68,57
Attention	82,86

Based on the table above, students 'interest in learning in the aspects of interest, awareness, and Participation is in the high category, and students' learning interest in the indicators of attention is in the very high category.

Interest in Learning Experiment Class II

Based on the results of the posttest questionnaire analysis of students' interest in learning, the percentage of student interest was 81.19%, including the very high category. The percentage of student interest in the experimental class can be seen in Table 5. Based on the table, students 'interest in learning in the aspects of interest, awareness, and Participation is in the high category, and students' learning interest in the indicators of attention is in the very high category

Table 5. Percentage of Indicators of Learning Interest in Experiment Class II

Interest Indicator	Percentage
Interest	78,75
Awareness	80,74
Participation	77,64
Attention	89,63

Comparison of Learning Interest in Experiment Class I and Experiment Class II based on Indicators of Learning Interest.

In this study, the indicators of interest in learning according to Djamarah are used because, according to the researcher, the indicators proposed by Djamarah are simpler, including:

a. Interest

Students interested in a certain field of study will feel interested in learning it. They will learn things related to the field of study and will be enthusiastic in the learning process without burdening them (Pasaribu, 2017). The comparison of the percentage of interest indicators can be seen in Fig. 3. Based on the picture, it can be seen that the percentage of the questionnaire indicator of learning interest "Interest" with a higher percentage is the experimental class II.

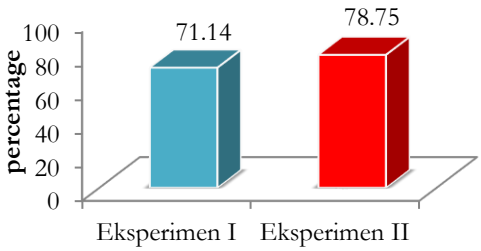

Figure 3. Percentage of Interest Indicators for Experiment Class I and Experiment Class II

b. Awareness

Awareness is a conscious effort or impetus to carry out the learning process and creates directed behavior to achieve goals in the learning process (Pasaribu, 2017). The comparison of the percentage of awareness indicators can be seen in Figure 4. Based on the picture, it can be seen that the percentage of the questionnaire indicator of interest in learning "Awareness" is higher, namely the experimental class II.

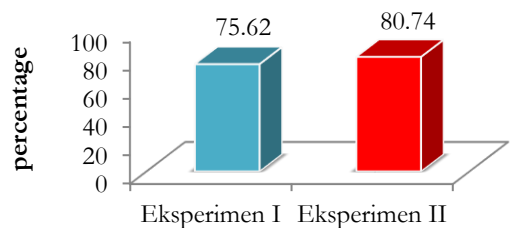

Figure 4. Percentage of Awareness Indicators for Experiment Class I and Experiment Class II

c. Participation

Participation or involvement can be interpreted as someone's interest in an object so that that person will be happy and interested in doing activities related to that object. The greater a person's interest in an object, the more he will participate in that object (Lutfiani, Lukum, & Rumampe, 2016). The comparison of the percentage of participation indicators can be seen in Figure 5. Based on the picture, it can be seen that the percentage of the questionnaire indicator of interest in learning "participation" is higher, namely the experimental class II.

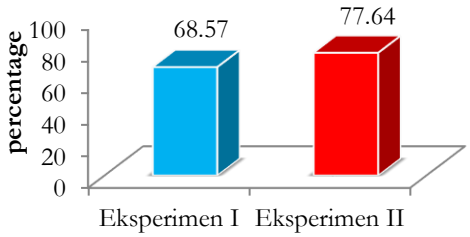

Figure 5. Percentage of Participation Indicators for Experiment Class I and Experiment Class II

d. Attention

Attention in learning is the concentration or activity of a person on observation, understanding, or anything else by setting aside things that are not related to the learning. So, students interested in a field of study will have an interest in learning, their souls and minds will focus on that learning (Pasaribu, 2017). A comparison of the percentage of attention indicators can be seen in Figure 6. Based on the picture, it can be seen that the percentage of the questionnaire indicator of learning interest "Attention" was higher in the indicator of awareness, namely the experimental class II.

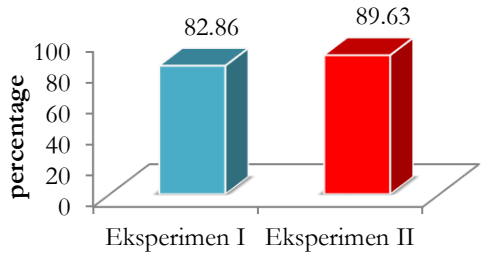

Figure 6. Percentage of Attention Indicators for Experiment Class I and Experiment Class II

In experimental class I, the indicator of interest in learning which has the highest percentage is the indicator of attention, which is equal to 82.86%. This is in line with research conducted by Rajagukguk (2009), which states that students' interest in learning who is treated with computer multimedia is better than learning without using computer multimedia. This is supported by the advantages of computers, including being able to help old students in receiving learning material, stimulating students to work on practice questions because of the pictures and their attractive appearance, computer control is in the hands of students so that the speed in running multimedia computers can be adjusted to the speed of students in understanding the material, learning can be delivered more interesting so that it can increase students' interest in paying attention to learning (Rajagukguk, 2011). The indicator of interest in learning with the lowest percentage is the indicator of Participation at 68.57%. Lack of Participation in learning is due to the limitations of computer multimedia where learning with computer multimedia is only effective when used by one person or a small group (Suryani, Basir, & Rusmin, 2014). But in

research, the learning process is carried out by the method of discussion and groups, wherein one group there are only 1 or 2 computers or laptops.

The results of this study indicate that computer multimedia can help older students in receiving material because computer control is in their hands. Computers can also help attract students' interest in learning. However, the use of multimedia computers in the learning process also has a weakness: the high cost of procuring computers for learning. Although this can be overcome by using students' laptops, this is not effective because the size of the laptop is quite large and heavy, making students object to carrying it.

In experimental class II, the indicator of interest in learning with the highest percentage is the indicator of attention, 89.63%. The results of this study are in line with research conducted by Isma Ramadhani Lubis and Jaslin Ikhsan (2015) that learning with Android-based multimedia can be used to increase student motivation in paying attention to learning. This is encouraged because of the advantages of using android multimedia in the learning process, namely the flexibility in using Android to be used anytime and anywhere without any time limit. These advantages are supported by Android devices that are small in size, light in weight, so they are easy to carry anywhere (Lubis & Ikhsan, 2015). Android-based learning is effective when used in learning. Android-based multimedia can support student activities anywhere and anytime, so students can find information according to their needs (Fatma & Partana, 2019). Based on the interview results, most of the students were interested in Android-based learning because, according to them, using Android was easier. It could help them understand learning. It was not heavy, and it could be said that all students in the experimental class II had an android.

The indicator of interest in learning with the lowest percentage is the indicator of Participation which is 77.64%. Lack of Participation in learning using multimedia android occurs because of the limitations of android multimedia, including not all students have devices that can support android-based learning and the type and quality of Android that students have to affect the appearance of android multimedia which sometimes causes less than optimal material display (Lubis & Ikhsan, 2015). When the research was carried out, the shared media could not be operated optimally on devices with different operating systems. Researchers overcome this limitation by doing screen capture media and distributing it to students in pdf format. The results of this study indicate that learning using multimedia android is more effective in increasing students' interest because of the practicality of android multimedia, especially because its small size and lightness make it easier for students to carry it anytime and anywhere. However, the use of Android-based multimedia is only limited to Android devices.

CONCLUSION

The results showed a significant difference between the learning interest of experimental class I, which was carried out with computer multimedia, and experimental class II, which was carried out with android multimedia. The experimental class questionnaires I and II were with high and very high categories. In both classes, the indicators of interest, awareness, and Participation were categorized into high categories, while the indicators of attention were very high. The use of computer and android multimedia can increase students' interest in learning chemistry, especially on indicators of attention influenced by practicality and ease of use of both multimedia.

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