The use of quartet card game on hydrocarbon to improve learning outcomes ten-grade students

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Abstract. This study has the results of applying for a quartet media game card in student learning outcomes about Hydrocarbons in the Class X MA Darel Pekanbaru. The teacher must understand the types of media available at the school because learning with media can make it easier for students to understand subjects that are often difficult to manifest in traditional learning. One of the media created for hydrocarbon lesson material is quartet card game media because hydrocarbons are one of the chemical learning materials. Chemistry is the science of nature and the nature of things that shape our environment and various changes. With the media quartet card game can help students' motivation in learning so that it can improve student learning outcomes. This type of research is an experimental study with a randomized pretest-posttest control group design. The population of this study is all classes of Pekanbaru Darel X Learning which consist of 7 classes. The sample in this study was obtained after the normality and homogeneity tests, were classes X5 and X7. The experimental class was applied with quartet classes and traditional learning media and control card games. Data were analyzed using a significance level (α = 0.05) and dk = 44, based on data analysis and processing, obtained tcount > t table ie 2.82 > 1.68, this means that media applications can improve student learning outcomes quartet learning card game results with the subject of Hydrocarbon in class X Darel Hikmah Pekanbaru. The influence of the media quartet applies card games for learning outcomes on hydrocarbons in class X MA Darel Hikmah Pekanbaru 15.3%. This study also shows that the use of quartet game cards can improve student learning outcomes.

1. Introduction
Changes in education especially in learning require innovative ideas, so that the learning process can be carried out well and so that students and engage in a variety of cognitive, affective, metacognitive processes, it takes students' motivation in learning [1-3]. Motivation as a strong encouragement of student involvement in the long term in learning activities. a better understanding of the concepts taught will improve student quality and school quality. Lack of motivation from students in following learning makes students less understanding the lessons taught by the teacher[4-7]. Based on the results of interviews at MA Darel Hikmah Pekanbaru, Riau, information was obtained from one of the chemistry subject teachers at MA Darel Hikmah Pekanbaru, that student learning outcomes on the subject of Hydrocarbons in the 2014/2015 school year were still unsatisfactory. The average value of student tests on the subject of hydrocarbons is 69, while the minimum value set is 78, but there are still many students who have not reached the minimum value because students are less active in learning on the chemistry learning. especially students' understanding of hydrocarbon material is still lacking.
Students do not understand the material due to lack of activity and student involvement in finding relevant information about hydrocarbon material. This is due to one of them by lack of motivation to learn[8].

The process of learning hydrocarbon material is usually carried out using conventional methods or group discussion methods, but in the group discussion process only students who are smart and diligent in reading are active and involved. This is evidenced when the teacher asks about the material presented, many students cannot answer the question, because students do not understand the material that has been delivered. This is because the teaching and learning process carried out by the teacher on the subject of hydrocarbons is carried out using conventional methods and is centered only on the teacher. This results in students tend to be bored so they do not master the material so that student learning outcomes are less satisfying and cause a lack of interest in students in chemistry learning[9].

Teaching that can take place well will show the potential for student collaboration in the classroom[10]. To improve student achievement is greatly influenced by the support of the teacher and how to teach the teacher [11]. Therefore, there is a need for learning media that can make students become more active and interested in the subject of hydrocarbons. Taking into account the various problems that exist, the learning media are needed to attract attention and increase student motivation so as to arouse students' interest in learning, especially on the subject of hydrocarbons which is one of the most commonly found chemical materials in the surrounding. Learning media can also involve students actively in the learning process, so that students' understanding of the material taught will increase. One that can help improve student achievement in learning is a media game in learning. With the existence of game-based learning media presented include a good simulation so that it can attract students' interest and attention of students. Almost every learning situation involves learning media that include verbal and visual information, such as text and images that must be continued understanding by students to achieve learning goals. To make good learning media by applying learning knowledge and adapting principles to learning concepts. The learning media game is one of cooperative learning because students work together in groups and achieve individual and group learning goals through peer feedback and discussion on the game media in learning. One of the media games in learning that can support student motivation is the quartet card game media. Quartet cards are a kind of game consisting of several numbers of picture cards, from which the information is written in the form that describes the image. Usually the writing of the title of the picture is written at the top of the card and the writing is more enlarged or thickened and the writing of the image, written two or four rows vertically in the middle between the title and the image. Quartet card game media can also improve student learning outcomes because each student plays an active role in this game and there will be positive changes in student learning attitudes. So the author wants to apply learning media in the form of quartet card games to hydrocarbon material. With the presence of card game media, it is expected to reach the level of student learning outcomes in class X, especially on hydrocarbon material.

2. Methods
The study was conducted in class X MA Darel Hikmah Pekanbaru even semester, 2015/2016 academic year. The time of data collection began in the fourth week of April 2016 to the fourth week of May 2016. The population in this study were all students from 7th grade X, class X1 - X7 while the sample was determined randomly based on the results of the prerequisite test material which is usually distributed and tested for homogeneity. Class X5 was obtained as an experimental class and class X7 as a control class. Experimental research was carried out in two classes with a Randomized Pretest-Posttest Control design group such as Table 1.
Table 1. Research Design Research Design

| Class      | Pretest | Treatment | Posttest |
|------------|---------|-----------|----------|
| Experiment | T₀      | X         | T₁       |
| Control    | T₀      | -         | T₁       |

Information:
T₀: the results of the experimental class pretest and control class
X: treatment of the experimental class with the application of the Quartet Card learning media
T₁: results of the experimental class and control class posttest

Data collection techniques in research are test techniques. The data collected were obtained from:
(1) The prerequisite material test results, (2) Pretest, carried out in both classes before learning about hydrocarbon topics, and (3) Posttest, given to both classes after learning about hydrocarbon topics. While the data analysis technique used in the study is hypothesis testing using the t-test.

2.1 Normality test
Normality test is a test that is conducted to determine the normal whether or not a data distribution.

2.2 Homogeneity Test
Homogeneity test is a test to determine whether two or more groups of data in the study are homogeneous. Homogeneity test, After the data are normally distributed then the homogeneity test is carried out by testing the variance of the two samples (homogeneous or not).

2.3 Hypothesis testing
Hypothesis testing is a test conducted to determine whether the hypothesis is accepted / not. Hypothesis testing is done using the one-party t test. With the testing criteria, the hypothesis is accepted if t count > t table with degrees of freedom dk = n₁ + n₂ - 2 with α = 0.05 for the other degree of price t the hypothesis is rejected (28)

2.4 Effect coefficient
The influence coefficient is a test used to determine the proportion or percentage of total variation in the dependent variable explained by the independent variable.

3. Results and Discussion

3.1 Test the Normality of Prerequisite Material Data
The data used are the results of the prerequisite material test in table 2

Table 2. Results of Analysis of the Normality Test for Prerequisite Material Data

| Class | N  | ̄x  | S    | L_max  | L_table |
|-------|----|-----|------|--------|---------|
| X₅    | 24 | 70,20 | 8,72 | 0,164  | 0,173   |
| X₂    | 22 | 70,79 | 8,94 | 0,0683 | 0,190   |

Information:N = the amount of data in the sample; ̄x = average sample value; S = standard deviation

Table 2 shows normality test results for classes X₅ prerequisites obtained by Lmaks<Label, which is 0.164 <0.173 and class X₂ obtained by Lmax<Label which is 0.0683 <0.190.

3.2 Test Homogeneity of Prerequisite Material Data
Table 3. Results of Analysis of Homogeneity Test Data for Prerequisite Material

| Class   | N  | \(\sum X\) | \(\bar{x}\) | \(F_{\text{table}}\) | \(F_{\text{count}}\) | \(t_{\text{table}}\) | \(T_{\text{count}}\) |
|---------|----|-------------|-------------|------------------|------------------|-----------------|------------------|
| X\(\text{dan} X_7\) | 24 | 1685        | 70,20       |                  |                 |                 |                  |
|          |    |             | 2,78        | 1,05            | 2,02            | -0,12           |                  |
|          | 22 | 1557,5      | 70,79       |                  |                 |                 |                  |

Information: \(N\) = the number of student; \(\sum X\) = number of material values prerequisite for all students; \(\bar{x}\) = average student prerequisite material value

Table 3 shows the test homogeneity of material prerequisites for classes X\(5\) and X\(7\). Class X\(5\) and X\(7\) have a value of \(F_{\text{count}} < F_{\text{table}}\) which is 1.05 < 2.78 and the results of the calculation of \(t\)-test of two parties are obtained \(t_{\text{hitung}}\) value is located between \(-t_{\text{table}}\) and \(t_{\text{table}}\) which is \(-2.02 < 0.12 < 2.02\) so that both classes homogeneous.

3.3 Pretest-Posttest Normality Test

The results of the pretest and posttest normality tests from the experimental and control classes in Table 4

Table 4. Pretest-Posttest Data Normality Test Results

| Data   | Class    | N  | \(\bar{x}\) | S    | \(L_{\max}\) | \(L_{\text{table}}\) |
|--------|----------|----|-------------|------|--------------|------------------|
| Pretest| Experiment | 24 | 25,63      | 5,77 | 0,1257       | 0,173           |
|        | Control   | 22 | 26,70      | 5,20 | 0,1293       | 0,190           |
| Posttest| Experiment | 24 | 76,87      | 5,07 | 0,1443       | 0,173           |
|         | Control   | 22 | 70,34      | 10,75| 0,0838       | 0,190           |

Information: \(N\) = the amount of data in the sample, \(\bar{x}\) = average sample value, \(S\) = standard deviation

3.4 Hypothesis testing

The data used to test the hypothesis in the study is the difference between posttest and pretest scores. The results of hypothesis testing analysis are presented in Table 5

Table 5. Results of Hypothesis Test Analysis

| Class   | N  | \(\sum X\) | \(\bar{x}\) | \(S_{\text{gab}}\) | \(T_{\text{count}}\) | \(t_{\text{table}}\) |
|---------|----|-------------|-------------|------------------|------------------|-----------------|
| Experiment | 24 | 1230        | 51,25       | 9,15             | 2,82             | 1,68            |
| Control  | 22 | 960         | 43,64       |                  |                  |                 |

Information: \(N\) = the number of students receiving treatment, \(\sum X\) = the number of posttest and pretest differences, \(\bar{x}\) = the average value of the posttest and pretest differences

Table 5 shows \(t_{\text{count}} = 2.82\) and \(t_{\text{table}} = 1.68\), at \(dk = 44\) and \(t_{0.95}\). \(t_{\text{count}} > t_{\text{table}}\) so the hypothesis is accepted. Thus the application of quartet card game media can improve student learning outcomes on the subject of hydrocarbons in class X MA Darel Hikmah Pekanbaru.

3.5 Coefficient of Effect of Student Learning Outcomes

The data used for calculating the magnitude of the influence quartet card learning media application on improving student learning outcomes in research is the calculation of hypothesis test data with the value \(t = 2.82\) and \(n = 46\). So that the coefficient of influence (Kp) is 15.31\%. This shows that the application of quartet card game media has an influence on student learning outcomes on the subject of Hydrocarbon elements in class X MA Darel Hikmah Pekanbaru, which is equal to 15.31\%.

The application of quartet card game media in research is done after the teacher explains the subject matter. In the experimental class using quartet card game media while in the control class it is...
not. Before the study was conducted, the entire population, namely 7 classes from class X MA Darel Hikmah Pekanbaru, were first given a prerequisite material test. The results of analysis of the prerequisite material test data were carried out using the Lilliefors test. Next is the determination of the experimental class and the control class randomly selected, class X5 as the experimental class and class X7 as the control class.

Both samples were given a pretest to determine students' initial abilities on the hydrocarbon subject. After that, different treatments were given where the experimental class with media applications played quartet cards while in the control class without a media application playing quartet cards. Then the two samples were given posttest to determine the difference in values obtained after being treated. The difference in the value of the posttest-pretest is used to test the hypothesis and see the coefficient of influence of student learning outcomes on the topic of hydrocarbons.

Hypothesis testing using the right-t test shows the results that the hypothesis is accepted. Thus the hypothesis "The application of quartet card game media can improve Student Learning Outcomes in the Subject of Hydrocarbons in Class X MA Darel Pekanbaru Wisdom" accepted. The learning effect coefficient is obtained through data from the calculation of the hypothesis test with the magnitude of the coefficient of influence is 15.31%. This shows that the application of the Quartet Card game media has an influence on student learning outcomes on the subject of Hydrocarbon elements in class X MA Darel Hikmah Pekanbaru, which is equal to 15.31%.

Experimental class students have high learning motivation because of the application of quartet card game media. This media is a game that increases motivation and interest in students. This sense of motivation will lead to enthusiasm for learning in students so that there is an increase in learning outcomes. It can be seen that the average value of the pretest-posttest difference in the experimental class is 51.26 greater than the difference in the average value of the pretest-posttest control class by 43.63 and the increase in student motivation can be seen in the student's affective sheet.

To create a sense of competition between groups, at each meeting a player is transferred. Each player from the original group moves randomly to carry out the quartet card game competition. So that at each meeting, each group representative tries to collect the most quartet card scores so that the original group is the winner at each meeting. The application of quartet card learning media can increase student activity in the learning process. From the aspect of the average affective assessment of students in the experimental class is higher than the control class. Students from the experimental class are more actively involved in the learning process such as showing curiosity by often asking the teacher and actively answering the questions given. Experimental class students are more communicative with group friends and teachers than the control class. It can be seen that students want to ask a group friend or teacher if they have difficulties, students can express their opinions and students can answer questions correctly and logically. The average aspect of students taking part in the learning process in an orderly and disciplined manner also showed higher students in the experimental class than the control class. The affective observation of students proves the involvement of students in the learning process by applying quartet card learning media.

Increasing the activeness of students in learning can improve student learning outcomes. States that one way that teachers do to improve student learning outcomes is by activating students in the learning process. If students learn actively, then the information they receive can be stored longer so that student learning outcomes become better. A pleasant learning atmosphere makes students more motivated in following the learning process. This fun learning atmosphere is created because students do not feel bored in learning, where the application of quartet card game media is a learning medium in the form of a game. In addition, students become active in expressing opinions because students are motivated to take part in learning and when the student does not understand the material, the student also asks the teacher.

4. Conclusion
Based on the results of the study it can be concluded that: Application of Quartet Card learning media can improve student learning outcomes on the subject of Hydrocarbons in class X MA Darel Hikmah
Pekanbaru, The magnitude of the influence from implementation of the Quartet Card learning media on improve student learning outcomes on the subject of Hydrocarbons in class X MA Darel Hikmah Pekanbaru amounted to 15.31%.

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