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The Influence of The Discovery Learning Model Assisted with Power Point Media on Students' Activities and Learning Outcomes on The Subject of Colloids

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Abstract : The Influence Of The Discovery Learning Model Assisted With Power Point Media On Students' Activities And Learning Outcomes On The Subject Of Colloids. The purpose of this study is to investigate potential influences on students' activities and learning outcomes. Students in class XI of Medan High School participated in this study, which included two classes, specifically courses. Objective test questions and scores on student learning activity observation sheets are used in this study's data collection process. The study's findings demonstrated variations between the control group, which solely employed traditional teaching techniques, and the experimental group, instructed to utilize the Discovery Learning model with PowerPoint support. The average number indicates that the experimental class's learning activities and outcomes outperform those of the control group. According to the posttest hypothesis test findings using the t-test, the $t_{count} > t_{table} = 10.364$, higher than 2.04. The experimental class's average student learning activity outcomes in colloid topics were 75.3, whereas the control class's average scores were 52.7. Therefore, the Discovery learning approach using PowerPoint media influences student activities and learning results in colloid disciplines.

Keywords: Learning Outcomes, Activities, Discovery Learning, *Power Point*

Abstrak : Pengaruh Model Pembelajaran *Discovery Learning* Berbantuan Media *Power Point* Terhadap Aktivitas Dan Hasil Belajar Peserta Didik Pada Pokok Bahasan Koloid. Tujuan penelitian ini yakni untuk mengetahui apakah terdapat pengaruh terhadap hasil belajar siswa dan aktivitasnya. Penelitian ini melibatkan siswa kelas XI SMA Medan yang terdiri dari dua kelas yaitu kelas XI4 yang berfungsi sebagai kelas eksperimen dan kelas. Penelitian ini mengumpulkan data melalui soal tes objektif dan skor pada lembar observasi aktivitas belajar siswa. Hasil penelitian menunjukkan bahwa terdapat perbedaan antara kelas eksperimen yang diajar menggunakan model Discovery Learning berbantuan media PowerPoint dengan kelas kontrol yang hanya menggunakan metode konvensional. Nilai rata-rata tersebut menunjukkan bahwa hasil belajar kelas eksperimen lebih baik dibandingkan kelas kontrol dan aktivitas belajar kelas eksperimen juga lebih baik. Hasil uji hipotesis posttest dengan uji t menunjukkan bahwa $t_{hitung} > t_{tabel}$

= 10,364 lebih besar dari 2,04. Hasil aktivitas belajar siswa pada mata pelajaran koloid rata-rata 75,3 pada kelas eksperimen dan 52,7 pada kelas kontrol. Dengan demikian dapat disimpulkan bahwa model Discovery learning berbantuan media PowerPoint memberikan pengaruh terhadap aktivitas dan hasil belajar siswa pada mata pelajaran koloid.

Kata kunci: *Hasil Belajar, Aktivitas, Discovery Learning, Power Point*

▪ INTRODUCTION

One of the scientific topics that significantly impacts daily life is chemistry. Chemistry is used in many aspects of life, including economics, law, geology, medicine, agriculture, industry, and the advancement of science and technology. Colloid system material is rote material and contains abstract concepts, making students less interested in studying it (Lase & Andromeda, 2019). Several abstract concepts in colloidal materials that emphasize conceptual understanding include the topics of the Tyndall effect, Brownian motion, adsorption, lyophilized colloids, and lyophilized colloids which are difficult to understand. These concepts will be considered difficult by students so that it can reduce their willingness to learn in understanding and studying colloid material which will later have an impact on students' low learning outcomes. Therefore, teachers as facilitators can present learning materials that can clearly visualize the abstract nature of this colloidal material (Khusnaini et al., 2021).

Chemistry is a scientific subject that has a big influence on day-to-day life. Numerous facets of existence, such as economics, law, geology, medicine, agriculture, industry, and the development of science and technology, depend on chemistry. In addition, educators need to be able to develop engaging teaching strategies so that pupils stay involved in class and become more eager to learn (Mudawamah., 2022). Therefore, in assessing and learning chemistry, you must pay attention to the characteristics of chemistry as a product and process. One of the disciplines that is thought to be challenging and dull is chemistry. The learning outcomes for children will decline if this presumption is kept about them. To make the learning process more engaging and straightforward for students to follow, the most recent innovations must be included using various techniques and approaches (Agustin et al., 2019).

At SMA NEGERI 14 Medan, the students' learning completion rate was only 65% of their KKM score, which is 76. Researchers also discovered that learning occurred mainly with the instructor in the classroom, with little to no student-teacher contact. Based on observations and discussions with chemistry instructors, these conclusions were drawn. Chemistry teachers who teach in class still use conventional methods and assignments and teachers only prioritize cognitive and affective aspects, while the psychomotor aspects of students are still very lacking. The lack of teacher expertise in using media that is developing nowadays results in students' learning activities and learning outcomes being reduced. In this sophisticated era, teachers must be able to communicate with the world of technology so that students who take part in the learning process in class are interested and there is an increase in understanding of the material. taught in class.

A learning strategy called discovery learning may enable students to reach their most significant potential. It is possible to transform teacher-centered learning environments into student-centered ones by implementing the Discovery Learning Model. Students will be directly involved in the learning process because they will discover for themselves what they are learning under the guidance of their teacher. By finding the material themselves means they understand the material better and of course learning will be more meaningful (Hartini, 2021). In the meanwhile, Isnawati (2022) asserts that teachers need to be able to create captivating courses that motivate students to actively participate in their education as part of the cognitive learning paradigm known as discovery learning (Marisya et al., 2020). From these perspectives, it is also feasible to conclude that the discovery learning model is an educational approach that develops students' critical thinking skills and gives them a more active role in exploring their own learning concepts and producing learning outcomes that they will remember (Nurhadi, 2020).

Learning media may be referred to as an internal learning support tool since it can be utilized to pick up students' interests and help them develop their talents or skills in order to assist successful learning (Putri et al., 2022). One learning medium that can be utilized is Microsoft Power Point, a form of software used to design presentation documents in slide form.

Some classroom activities include both the instructor and the students regarding teaching and learning. The teacher's actions influence students' learning activities in the classroom. The personal actions of a teacher when teaching can create and maintain an active and more interactive classroom atmosphere, which is very important for the quality of education (Wahab & Rosnawati, 2021). High student activity in learning makes the learning process effective. According to Siti's study findings in 2022, there is a direct correlation between activities and successful learning. When students actively engage in learning activities, their classroom learning will be much more meaningful.

The study aims to determine the degree to which using PowerPoint presentations in conjunction with the discovery learning paradigm affects student learning outcomes, as stated above.

▪ METHOD

The study was carried out at SMA Negeri 14 in Medan. All students in class XI MIPA served as the study's population, and two classes, XI MIPA 1 as the experimental class and XI MIPA 4 as the control class, were used as samples. Random sampling procedures were used to obtain or choose the samples. This study aims to evaluate the efficacy of the PowerPoint media-assisted discovery learning model on colloids.

Data on student learning outcomes from the experimental and control classes will be subjected to statistical testing, specifically the Independent Sample T-test, to examine differences. The data's normality and homogeneity test is performed first, followed by the t-test.

▪ RESULT AND DISCUSSION

This study was carried out at SMA Negeri 14 Medan with two different classes: one was used as an experimental class, which used PowerPoint media and the Discovery Learning learning paradigm, while the other was used as a control group, which received instruction using conventional techniques. A pretest is administered to ensure the students' starting knowledge of colloid systems prior to delivering distinct courses to each

class. The instructor assisted in determining the learning outcomes and activities of the two student learning groups following treatment by having the students complete a student learning activity questionnaire and giving them a posttest at the conclusion of the class.

Normality Test

Using the Chi-Square test, the data was examined for normality, and the findings demonstrated that, at a significant level of 0.05, the posttest scores for both sample groups had average data, or $(X^2)_{count}<(X^2)_{table}$, for both the experimental class and the control class (Sugiyono, 2015). Accordingly, the data is normally distributed, as shown in Table 1 below.

Table 1. Posttest Data Normality Test

No	Data	X^2_{count}	X^2_{table}	Conclusion
1.	Experimental class posttest	9.18	11.07	Normal
2.	Control class posttest	10.14	11.07	Normal

The table indicates that:

1. Data on chemistry learning outcomes for pupils is often dispersed. The way to find this is to use the absolute level $\alpha = 0.05$ and assess the normality of the student learning outcomes data acquired (X^2) count for the posttest 9.18 in the experimental class by looking at the visible data $(X^2)_{count}<(X^2)_{table}$. This will provide dk 5 of 11.07.
2. It is possible to assess the normality of the control class student learning outcomes data acquired (X^2) computed for the posttest 10.14 after identifying the absolute level $\alpha = 0.05$ and dk 5 is 11.07 from the visible data $(X^2)_{count}<(X^2)_{table}$. The findings demonstrate a normal data distribution on students' chemistry learning outcomes.

Using the Chi-Square test to test for data normality, it was found that, with N = 30 for the experimental class and the control class and a significance level of 0.05, the posttest scores for both sample groups showed normal data or $(X^2)_{count}<(X^2)_{table}$.

Homogeneity Test

Using Microsoft Excel 2013, determine if the posttest and non-test data are homogeneous. The results of the homogeneity test computation for the posttest data for the experimental and control classes are shown in Table 2 below.

Table 2. Sample Homogeneity Test

Data source	Class	S^2	F_{count}	F_{table}	Information
Posttest	Eksperimen	53.61	1.75	1.86	Homogeneous
	Kontrol	94.13			Homogeneous

S2 = Sample Variance; F_{table} = db (n1 – 1), (n2 – 1) ($\alpha = 0.05$)

The experimental and control classes' post-test results are computed using the value table for the F distribution with a real level of α = 0.05, a db in the numerator of 29, and a db in the denominator of 29. This yields Ftable < F α 0.05 (29.29) = 1.86. Given that the values of Fcount.

Hypothesis Testing

In Microsoft Excel 2013, a right-sided t-test is a statistical test that can be used to evaluate a hypothesis once the homogeneity and normality of the data have been confirmed. Finding out if the study's hypothesis is accepted or denied is the aim of this test. Ho is accepted and the degrees of freedom (db) are n - k and α = 0.05 if $t_{count} < t_{table.}$ The data from the hypothesis test are shown in Table 3.

Table 3. Hypothesis Test Results PostTest Data

Class Data	t_{count}	t_{table}	Information
Experiment **Posttest** $\bar{x}$ = 78.9 S = 7.322 S^2 = 53.619 **Control** **Posttest** $\bar{x}$ = 55.9 S = 9.702 S^2 = 94.137	5,45	2,04	Ha is accepted, Ho is rejected

According to calculations, Ho is rejected while Ha is approved when tcount = 5.45. The ttable = 2.04 result is obtained from the t distribution data. The results of this experiment suggest that learning outcomes about collisions are impacted by the Discovery Learning Learning Model, Supported by PowerPoint Media. The Discovery Learning learning model's emphasis on student autonomy in finishing the learning process demonstrates its effectiveness. Additionally, the paradigm has the potential to enhance student learning outcomes, and it is reinforced by media that can heighten students' curiosity about learning. One of the media that can be used for successful student learning outcomes is Power Point media, with various variations provided, teachers as facilitators during the learning process can create slides that attract students' attention by adding visual effects of sound, movement and animation. can be used as an option to display learning material during the learning process which can show students' learning success.

Numerous studies' findings indicate that as learning media are added, learning models' significance will grow. Nainggolan (2019) found that using media and power point-based learning models might enhance student learning results. Power point models and other media can help students learn more about chemistry, according to Nurfalah et al. (2023). This indicates that media can also significantly contribute to students' improved learning outcomes.

Calculation of Student Activities

The average learning activity scores that students receive for the experimental and control classes clearly show the outcomes of the student activity calculation. The information is displayed in Table 4 below:

Table 4 Average Assessment of Student Activities

Realm	Class	Average
Student Activities	Experiment	75.3
	Control	52.7

The average score for the learning activities in the experimental class, which consisted of 30 students, was 75.3, whereas the control class, which also consisted of 30 students, had an average score of 52.7. Completing an observation sheet on students' learning activities by other researchers during the learning process led to the discovery of these findings. It became clear from the researcher's presentation of the data how each class was handled differently throughout the educational process. The experimental class's learning activities were superior because the students were taught utilizing the discovery learning paradigm, which benefited from using PowerPoint materials. The control class had an average score of 73.5, showing far more student learning activities than the experimental class, which only scored an average of 52.7. Observing this difference in the two courses' average results is possible. The PowerPoint media makes the material presentation interesting, and the discovery learning stage can encourage students to actively seek out their knowledge and understanding with the assistance and guidance of the teacher, resulting in much better learning activities from the start of the lesson to the end. This is why students in the experimental class pay close attention to the learning process and can participate in discussions. This is different from the control class whose learning activities are below the average for the experimental class because the delivery of material during learning only uses conventional models without the help of interactive and interesting media, thus making students' learning activeness invisible, students tend to get bored and are not interested in participating in learning.

This is supported by other research using power point media with different material, namely, Mandasari (2023) stated that the results of his research showed that learning theme 8 by applying power point media experienced a significant increase. According to research conducted by Jannah., et al (2020), if the media used is interesting and appropriate, it can influence and increase learning activities for students. Students adopting the discovery learning paradigm must be able to use their talents to search for and locate stuff deliberately (Kresnadi., et al 2018). By using power point media, students' enthusiasm for participating in the learning process increases, thereby motivating students to continue learning with full enthusiasm so that learning activities increase.

▪ CONCLUSION

Following the completion of the study, it was shown that students' learning results in chemistry when taught about colloid systems were significantly impacted by the use of the Discovery Learning learning paradigm with the help of PowerPoint materials. It is intended that other researchers will make use of the research's recommendations. Additional research on other subjects is required, and the findings may be contrasted with various media and instructional strategies.

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