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# The Influence of Inquiry Learning Model Implementation on Students Critical Thinking Ability in Class Learning Activities.

***Abstract***

The objective of this research is to assess how the inquiry-based learning approach can impact the enhancement of critical thinking skills. This is a quantitative investigation that employs an experimental methodology with a Pretest-Posttest Control Group Design. The study includes two sets of participants, namely the experimental and control groups, which were chosen randomly. The sample size consists of 120 students, with 60 pupils in class A-the experimental group, and 60 students in class C-the control group. The results reveal that the mean score of class A (the experimental group) was 85.74, while class C (the control group) scored an average of 70.65. The data analysis indicates that the t-value exceeds the t-table at a 5% significance level. When the t-value surpasses the t-table, the research hypothesis is accepted, signifying a significant difference in the impact of using the inquiry-based learning model on the critical thinking abilities of students who learn through the lecture approach.

**Keywords: Inquiry Learning Model, Critical Thinking, Experimental, Students.**

**Abstrak**

Tujuan dari penelitian ini adalah untuk menilai bagaimana pendekatan pembelajaran berbasis inkuiri dapat berdampak pada peningkatan keterampilan berpikir kritis. Ini adalah penyelidikan kuantitatif yang menggunakan metodologi eksperimental dengan Desain Kelompok Kontrol Pretest-Posttest. Penelitian ini melibatkan dua set peserta, yaitu kelompok eksperimen dan kontrol, yang dipilih secara acak. Besar sampel terdiri dari 120 siswa, dengan 60 siswa di kelas A-kelompok eksperimen, dan 60 siswa di kelas C-kelompok kontrol. Hasil penelitian menunjukkan bahwa nilai rata-rata kelas A (kelompok eksperimen) adalah 85,74, sedangkan kelas C (kelompok kontrol) mendapat nilai rata-rata 70,65. Analisis data menunjukkan bahwa nilai t melebihi t tabel pada tingkat signifikansi 5%. Apabila nilai t melebihi t tabel maka hipotesis penelitian diterima yang menandakan adanya perbedaan yang signifikan dampak penggunaan model pembelajaran berbasis inkuiri terhadap kemampuan berpikir kritis siswa yang pembelajarannya melalui pendekatan ceramah.

**Kata Kunci: Model Pembelajaran Inkuiri, Berpikir Kritis, Eksperimen, Siswa.**



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## INTRODUCTION

A learning system called integrated learning enables students to actively seek for, investigate, and discover scientific topics and principles in a comprehensive, significant, and real-world setting. Learning that connects multiple concepts, ideas, abilities, attitudes, and values, both inside and between subjects, is referred to as integrated learning. To equip students with practical knowledge and enable them to explore various subjects on their own, integrated learning emphasizes more on their active participation in the learning process. It is important to note that this approach pertains to the established curriculum, which comprises of strategies, materials, and methods used to structure learning activities in order to achieve specific educational goals. The 2013 curriculum seeks to enhance the effectiveness of educational procedures and results, which guide the development of students' overall moral and noble character and ensure that each educational unit's graduation competency standards are integrated and balanced.

The educator, taking on the role of a guide, needs to employ diverse resources, approaches, techniques, and instructional frameworks to delve into learners' aptitudes in the instructional and learning journey, specifically pertaining to the study of the physical world, acknowledging the significance of the caliber of education's course and outcomes, primarily for pupils. Physical science constitutes a scientific domain that concerns itself with the systematic exploration of natural phenomena, thus encompassing both the act of uncovering and the acquisition of a corpus of data in the guise of information, ideas, or laws. Natural science can help students develop their critical thinking abilities so they can participate actively in class rather than just memorize information. According to the objectives and characteristics of learning science, students are not invited to memorize but to practice activities directly so that they can gain experience and solve problems from the activities that have been carried out.

Based on an interview with one of the teachers, he stated that learning was still teacher-centered. The methods of lectures, questions, and assignments are used to facilitate learning. Students frequently report boredom when using the teacher-centered learning lecture technique. Students only pay attention to teachers' explanations during the learning process. Less diverse learning models lead to learning that is overly dominated by the teacher (teacher-centered). More kids are treated as objects by teachers than as subjects. Individual learning mastery is not given much emphasis in education, and students are not given the opportunity to grow their capacity for holistic (complete), creative, aggressive, and rational thought across a variety of academic areas.

In an effort to improve the quality of learning so that students readily understand what they are learning, a teacher must be able to choose a learning model that is relevant to the subject matter as an alternative to selecting the best learning model. The ideal learning model encourages student participation in the learning process, produces memorable experiences, and fosters the growth of students' critical thinking

abilities. Critical thinking means not simply trusting information that comes from various sources but thinking reflectively rather than just accepting outside ideas without significant understanding and evaluation. In mental tasks including problem-solving, decision-making, persuading, assumption analysis, and doing scientific research, a concentrated and clear process known as critical thinking is used. Critical thought leads to profound revelation. The significance of an experience is revealed by this information, which teaches students the underlying notion. Students' ability to think critically may be enhanced by using a learning paradigm that calls for it when solving scientific problems.

The inquiry learning strategy can be used by students to acquire and develop their critical thinking skills. A set of educational exercises emphasizing the process of critically and analytically thinking about an issue in order to explore and identify solutions might be understood as an inquiry. The inquiry paradigm is also thought of as instruction that gets in the way of kids conducting their own experiments. It is envisaged that children will gain knowledge and skills by self-discovery rather than by memorizing a list of facts. In a broad sense, you want to see what's going on; you want to do something; you want to find answers to your own questions; connect one discovery with another; and compare what you find with what others find. The ability to think critically can be developed in kids by encouraging their curiosity and encouraging them to seek out their own solutions through the use of inquiry-based learning. The teacher can pose a question for which the solution is known during the inquiry learning process; this will give students the chance to study more and come up with their own solutions. Accordingly, pupils' critical thinking abilities will manifest and can grow. As a result, the inquiry learning paradigm and the growth of students' critical thinking abilities are connected.

## METHOD

This research can be classified as quantitative research utilizing experimental methods. The investigative approach was utilized to evaluate the influence of the inquiry-based education model on the critical thinking abilities of students. The research implemented a Pretest-Posttest Control Group Design, which encompassed two groups selected randomly: the control group and the experimental group. The experimental group underwent treatment, whereas the control group did not. Before the treatment, a pre-examination was conducted on both groups, followed by a post-examination after the treatment. The pretest results of both groups were analyzed to ensure homogeneity, while the posttest results were used to determine the normality of the data and the effect of treatment. The study population comprised all students in classes A and C, totaling 120 students. Cluster random sampling was used to choose the sample, and the selection was randomized using a lottery based on class. The study utilized documentation and tests to collect data.

## RESULT AND DISCUSSION

After conducting a comprehensive investigation on category, A (the cohort that underwent experimentation) prior to introducing the inquiry-driven learning approach, the amassed data divulged that the top score was 90 and the bottom score was 33. The extent of the values (R) was 57, and the number of class segments (k) was determined to be 6, with the class segment span (p) being calculated correspondingly. Since the t counts were discovered to be lower than the t tables, it can be inferred that the academic achievements of the students in the experimental group adhere to a standard distribution. Correspondingly, the research outcomes for category C (the group under control) before implementing the lecture-based education method indicated that the highest score was 83 and the lowest score was 37. The extent of the values (R) was 46, with 6 categories being utilized for the number of class intervals (k), and the class interval length (p) was calculated. Since the t counts were found to be lower than the t tables, it can be concluded that the grades of students in the control group also follow a normal distribution.

Based on the computation, it is evident that the largest variant is dk quantifier = n - 1 = 32 - 1 = 31, while the smallest variant is dk denominator = 31 - 1 = 30. Using the f-count = 1.26 and f-table = 1.835, we can accept Ha and conclude that there is no significant difference in value between the experimental group and the control group if f-count < f-table = 1.26 < 1.835. As such, it is simple to distinguish between the experimental and control classes. The computations indicate that t-count = 0.3885 and t-table = 1.9996, with α = 5% and dk = 32 – 31 -2 = 61. Since t-count < t-table, which is 0.3885 < 1.9996, we can accept H0 and conclude that there is no significant difference in the pretest scores of class A and class before receiving treatment. For the posttest normality assessment in the experimental class at a significance level of α = 5% with dk = 6-1 = 5, we obtained 2 counts = 8.124 and 2 tables = 11.0705. Similarly, for the posttest normality analysis in the control class at a significance level of α = 5% with dk = 6-1 = 5, we obtained 2 counts = 7.310 and 2 tables = 11.0705. As t counts < t tables, we can conclude that the data is normally distributed.

The outcomes of prior calculations suggest that the post-evaluation grades of pupils in categories A and C conform to a normal distribution and are even. Hence, the t-test was employed to verify any discrepancies between the mean values of the control and experimental groups. If the t-value surpasses the critical t-value, with a significance level of α = 5% and degrees of freedom (df) = 32+31-2 = 61, it can be concluded that there is a meaningful difference in the mean value of the experimental group. According to the final data, it can be deduced that the mean score of the experimental group X1 = 75.84 and the control group X2 = 60.75, with sample sizes of n11 = 32 and n22 = 31, resulted in a t-value of 4.476. With α = 5% and df = 61, the critical t-value is obtained as t-table = 1.6702. As the t-value exceeds the t-table, the null hypothesis (H0) is discarded, and the alternative hypothesis (Ha) is accepted. These findings indicate that the inquiry-based learning model has a constructive impact on learning.

Before learning begins using the inquiry learning model for the experimental class and the lecture method for the control class, a pretest is first held to find out the initial conditions of the two classes before learning. The pretest questions come from questions that have been previously tested in class, namely classes that have previously received material. Tryouts were conducted to find out whether the items met the quality of good questions or not. The tools used in testing the analysis of the test instrument include validity, reliability, level of difficulty, and differentiating power. The results of the 15 items tested in class showed that the questions that were appropriate to be used for the test were 12 items, and those used for the pretest and posttest were 10 items. Class C served as a control class with a scientific approach in the subsequent learning process, while class A served as an experimental class that received therapy utilizing the inquiry learning model. Both the experimental class and the control class received the same post-test questions when the learning process was complete. The results of the posttest scores were used to determine the final grade for the control class, whereas the outcomes of the posttest scores and skill scores determined the final grades for the experimental class.

The calculation outcomes for cluster A (test group) indicated an average rating of 85.74 with a standard deviation (S) of 13.95, whereas cluster C (control group) achieved an average rating of 70.65 with a standard deviation (S) of 12.76. The normality trial executed after the experiment for the test group revealed X2count = 8.124, and for the control group, X2count = 7.310. With $\alpha = 5\%$ and dk = 5, X2table = 11.0705, which indicates that both groups were distributed normally as X2count < X2table. The posttest t-test analysis was carried out by setting the criteria that H0 is accepted if t-count < t-table, with dk = n11 + n22 – 2, and a significant level of 5%. From the calculations, dk = 32 + 31-2 = 61, and t-count = 4.476 and t-table = 1.6702, with an average of 85.74 for the test group (A) and 70.65 for the control group (C). If t-count > t-table, which is 4.476 > 1.6702, then Ha is accepted, indicating variations in the learners' analytical thinking abilities after obtaining treatment. Thus, it can be concluded that there are differences in analytical thinking skills between students taught using the inquiry learning model and those taught using a scientific approach. Therefore, it can be inferred that learning with the inquiry learning model has an impact on students' analytical thinking abilities.

## CONCLUSION

The implementation of inquiry-based learning can enhance the critical thinking capabilities of students. Research studies reveal that Class A, which underwent the experimental approach, scored an average of 85.75, while Class C, the control group, obtained an average score of 70.65. It is evident that there is a notable distinction between the effects of inquiry-based learning and traditional lecture-based teaching on students' critical thinking abilities. Based on the disparity in the mean scores of the experimental and control groups, it can be concluded that the inquiry-based learning method positively impacts the critical thinking skills of students. The experimental class surpassed the control group in terms of mean score.

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