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Analysis of the Effect of Discipline Learn and Self-Confidence on Chemistry Learning Achievement

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Abstract:
Research has been conducted with the purpose of identifying the partial and simultaneous influence of discipline learn and self-confidence on student learning achievement in class X chemistry subjects at MA Darul Hikmah Pekanbaru. The kind of research adopted is survey research with quantitative approach. The research was conducted at MA Darul Hikmah Pekanbaru in the even semester of 2023/2034 using random sampling technique using the slovin formula so as to get a research sample of 122 students. Data collection techniques through literature studies and questionnaires. The results showed that discipline learn had a positive and significant reaction on chemistry learning achievement with a contribution of 17.5%, self-confidence had a positive and significant reaction on chemistry learning achievement with a contribution of 14.1%, and discipline learn and self-confidence simultaneously had a positive and significant reaction on chemistry learning achievement with a contribution of 18.2% the remaining part is likely influenced by other aspects not included in this research.

Keywords: Discipline Learn, Self-Confidence, Learning Achievement

Introduction

Education plays a very crucial role in helping humans face the challenges of life. This is due to the influence of education on all aspects of personality and individual development. With education, a person can develop various aspects of his personality, such as attitudinal values, knowledge, and skills (Wahab *et al*., 2021). Education acts as a crucial basis in producing quality human resources (Aprilla *et al*., 2023). Education can be understood as an effort that aims to build and shape, direct, and develop individual personalities and abilities.

Education can be provided in various ways, one of which is formal education organized in schools. Education in Indonesia has several levels, one of which is the Senior High School (SMA) level (Syaadah *et al*., 2023). At this level, students are given various knowledge, including one of which is chemistry (Priliyanti *et al*., 2021).

Chemistry is the first exact subject studied by grade X students in Senior High School (Pepi *et al*., 2019). Chemistry in high school is a subject that must be taught because it can develop students' thinking skills and encourage their creativity. But in practice chemistry is considered as one of the science fields that is less favored by students because it is difficult and boring for some students. One sign of a learner's learning difficulty is the low learning achievement he or she achieves (Hadewia, 2022).

Learning achievement is one of the evidences that shows the ability of a person who carries out the learning process according to the weight or value he has achieved (Reda Boro *et al*., 2021). Basically, the results obtained are not only due to the abilities and characteristics of students, but students need to have important factors in themselves to improve learning achievement, namely learning discipline (Nurjanah *et al*., 2021).

Discipline is very important in the learning process. A disciplined attitude in learners is one of the keys to success in obtaining maximum learning achievement (Winarsih *et al*., 2018). Disciplined learners will follow all class rules and be able to follow the learning process effectively. In theory, to obtain good learning achievement, students need to develop good and organized learning methods (Devi Oktavia *et al*., 2023).

Another internal factor that affects learning achievement is self-confidence (Dewi *et al*., 2020).

Self-confidence is an important element that should not be overlooked for the development of students in their learning. Self-confidence is defined as a belief in one's abilities, therefore individuals can do various things without feeling anxious. One of the activities that reflect students' self-confidence is the courage to express opinions during learning discussions and the courage to ask questions when facing difficulties in learning (Wati & Supriatna, 2023). Variations in the level of self-confidence possessed by individuals will certainly affect their learning achievement (Prasetiawan *et al*., 2020).

The results of temporary pre-research from a chemistry teacher in class X MA Darul Hikmah Pekanbaru there are various obstacles that arise during chemistry learning, namely: 1) more than 50% of students' chemistry learning achievement has exceeded the set score standard, 2) students tend to find it difficult to understand chemistry material, 3) some students come late to class and delay completing the tasks given by the teacher, 4) there are students who feel nervous, anxious, afraid when the teacher orders them to come forward in front of the class to do the task witnessed by their friends. So that during chemistry learning takes place, students are only silent, do not dare to express opinions and do not dare to ask questions.

Theoretical

Study Discipline

Discipline is defined as a condition formed through a process of behavior that reflects obedience, compliance, and regularity to things that must, must or are allowed to be done. Thus, discipline is not something that is brought from the beginning, but is something that is influenced by teaching or educational factors. Disciplined behavior for students is one of the keys to success in order to achieve maximum achievement or learning outcomes (Winarsih *et al*, 2018).

Self-Confidence

Self-confidence is a part of personality that reflects a person's belief in his or her abilities (Napitupulu *et al*., 2020). Self-confidence can support individuals to maximize their abilities so as to avoid the doubts that often interfere, having self-confidence allows one to increase their courage when going in front of the class and are enthusiastic about participating in learning in the classroom, so there will also be changes in students not only in learning achievement but also in the behavior and attitudes of students.

Learning Achievement

Learning achievement is a form of achievement from the process that has been passed during learning. Achievement will be equivalent to the process that students go through, which is expected to lead to a better direction. Learning achievement is one of the evidences that shows the ability or success of a person who carries out the learning process according to the weight or value he has achieved. Thus, learning achievement describes the maximum level of success that an individual achieves after going through learning activities.

Hypothesis

Hypotheses or basic assumptions are temporary conjectures on a problem that still need to be sought and must be proven correct through research. The hypotheses in this study are:

1. Discipline Learn variable is proven make a significant influence on the chemistry learning achievement of grade X students at MA Darul Hikmah Pekanbaru.
2. Self-confidence variable is proven to make a significant reaction on the chemistry learning achievement of grade X students at MA Darul Hikmah Pekanbaru.
3. Discipline Learn and Self-Confidence variables together are proven to make a significant reaction on the chemistry learning achievement of grade X students at MA Darul Hikmah Pekanbaru.

Research Methods

This investigation applies a survey method based on a quantitative based approach with the aim of describing the data descriptively. The data collection process was carried out by distributing questionnaires

to a total sample of class X students, namely 122 students with 62 female students and 60 male students obtained by simple random method, with the calculation of the number of samples carried out using the Slovin formula to determine participants in the study. Here is the explanation of the formula:

$$n = \frac{N}{1 + N(e^2)}$$

Description:
n = Total samples
N = Total Population
e^2 = Error tolerance level (0.05)

The learning discipline and self-confidence questionnaire instruments were designed in a closed format and used a Likert scale with four answer options that had been verified through validity and reliability tests.

Data obtained from questionnaire instruments regarding study discipline, self-confidence, and learning achievement in this study was analyzed using descriptive statistical methods. This analysis aims to describe and provide explanations related to the data collected. This study used Microsoft Excel and SPSS version 25 for Windows in processing descriptive statistical analysis data. After the data has been collected, the next step is data processing and analysis to ensure that the findings obtained are able to provide answers to research and test the hypotheses that have been formulated. The data analysis process in this review used SPSS version 25 software to check normality, homogeneity, linearity, and multicollinearity. Hypothesis testing was carried out by applying simple linear regression test, multiple linear regression test, F test, and coefficient of determination analysis.

Results and Discussion

Test Instrument

The instrument in this review, the tool used is a questionnaire given to class X students. To ensure the quality of the survey instrument, validity and reliability tests were conducted.

Validity Test Results

Researchers utilized SPSS version 25 to conduct validity tests on the independent variables, namely learning discipline (X1), self-confidence (X2), and learning achievement (Y). This test is carried out by adjusting the calculated correlation coefficient value / rcount against the rtable. The degree of validity (df) is calculated using the n-2 formula, where n refers to the number of samples.

The degree of validity (df) is determined to be 122-2 = 120, and with an alpha level of 0.05, the rtable value is 0.361. If the calculated value for each statement item, as displayed in the corrected total item correlation column is greater than or equal to the rtable value, a statement is considered valid if the calculated value exceeds the value listed in the rtable. However, if the value obtained is lower than r-table, the item is considered invalid. This test was conducted with SPSS 25 software, which resulted in 20 valid statements.

Reliability Test Results

This test evaluates the questionnaire used in the test to establish the impact of other independent factors (discipline learn and self-confidence) on the dependent variable (study achievement). Decision-making criteria, specifically alpha 0.60, must be determined before conducting the reliability test. Data is said to be reliable if the value obtained exceeds 0.60, while if the value is below 0.60, then the variable cannot be considered as a dependent variable. The findings of this reliability analysis for the variables used in this study are presented below:

Table 1. Reliability Test Results

No	Variables	Item	Coefficient AIpha	Alpha Test Cronbach	Description
1	Discipline Learn	20	0,829	>0,6	Reliable
2	Self-Confidence	20	0,901	>0,6	Reliable

Based on Table 1 shows that the variables in the questionnaire used in this investigation have met the reliability criteria, because the value obtained exceeds 0.60.

Analysis Prerequisite Test

Results Normality Test Results

This study analyzed the data using *Kolmogorov-Smirnov* because the sample size exceeded 50. Using SPSS software, this normality test produced the following results:

Table 2. NormaIity Test Results

One-Sample Kolmogorov Smirnov Test			
	Discipline Learn	Self-Confidence	Learning Achievement
N	122	122	122
Asymp. Sig (2-tailed)	.190	.200	.087

According to Table 2, the value for each variable exceeds 0.05, indicating that this data has a normal distribution.

Homogeneity Test Results

This test is conducted to evaluate whether the data has a uniform distribution or not. Testing the homogeneity of data from samples using One-Way Anova. The results of the homogeneity test obtained can be seen in the following explanation:

Table 3. Homogeneity Test Results

Test of Homogeneity of Variances		
Variables	**Significance**	**Description**
Study discipline with learning achievement	0,109	Homogeneous
Self-Confidence with learning achievement	0,937	Homogeneous

Table 3 indicates that each independent variable has a value that exceeds the 0.05 threshold, which means that all variables have equal variance and can be considered homogeneous.

Linearity Test Results

The purpose of this analysis is to determine whether there is a meaningful linear connection between two of the variables studied. The following results show the results of the linearity test obtained, namely:

Table 4. Linearity Test Results

Anova Table		
Variables	**Significance**	**Description**
Study discipline with learning achievement	0,866	Linear
Self-Confidence with learning achievement	0,813	Linear

Table 4 indicates that each independent variable has a value that exceeds the 0.05 threshold, indicating that all variables have a linearly significant relationship.

Multicollinearity Test Results

This test evaluates the intercorrelation between independent variables in the regression system. For the regression model to function optimally, the independent variables must be free from interrelationships with each other. The VlF (Variance lnflation factor) value indicates whether a relationship exists. If the tolerance value exceeds 0.l0 and the VlF is less than l0, then the independent variables in the regression model are considered free from multicollinearity. The results of this test are presented as follows:

Table 5. MuIticollinearity Test Results

Coefficients		
Variables	Collinearity Statistics	
	Tolerance	**VlF**

Discipline Learn	0.350	2.857
Self-Confidence	0.350	2.857

Table 5 shows that the discipline learn (X1) and self-confidence (X2) variables obtained tolerance values exceeding 0.l0 and VlF values smaller than l0.0. Thus, it can be concluded that there are no indications of multicollinearity among the independent variables in this test.

Hypothesis Testing

Simple Linear Regression Test Results Discipline Learn

This test is applied to measure how much impact the discipline learn variable has on learning achievement results. The following results are obtained from this test:

Table 6. Simple Regression Test Results of Discipline Learn

		Unstandardized Coefficients		
Model		**B**	**t**	**Sig.**
l	(Constant)	70.783	27.377	.000
	Discipline Learn	.216	5.052	.000

Based on Table 6, the model made in this study is: $Y = 70.783 + 0.216X_1$ with notes:

a. The constant (α) of 70.783 means that if the discipline learn is equal to zero, then the students'chemistry learning achievement is 70.783.
b. The regression coefficient (b) is 0.216 and indicates positive, which indicates that each one unit increase in learning discipline will result in an increase of 0.216 in chemistry learning achievement.

Simple Linear Regression Test Results Self-Confidence

This test is applied to measure how much impact the self-confidence variable has on learning achievement results. The following results are obtained from this test:

Table 7. Simple Regression Test Results Self-Confidence

		Unstandardized Coefficients		
Model		**B**	**t**	**Sig.**
l	(Constant)	72.491	29.158	.000
	Self-Confidence	.201	4.566	.000

Based on Table 7, the model made in this study is: $Y = 72.491 + 0.201X_2$ with notes:

a. The constant (α) of 72.491 means that if the self-confidence is equal to zero, then the students'chemistry learning outcomes are 72.491.
b. The regression coefficient (b) is 0.201 and indicates positive, this means that every one unit increase in self-confidence will cause an increase of 0.201 in chemistry learning achievement.

Multiple Linear Regression Test Results

The purpose of this test is to forecast the average value of the independent variable according to the values of the dependent variable. The results obtained from this test are as follows:

Table 8. Multiple Regression Test Results

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
Model	B	Std. Error	Beta		
l (Constant)	70.205	2.655		26.438	.000
Discipline Learn	.160	.073	.135	.960	.399
Self-Confidence	.070	.072	.310	2.214	.029

Based on Table 8, the model made in this study is: $\boldsymbol{Y = 70{,}205 + 0{,}160X_1 + 0{,}070X_2 + e}$ with notes:

a. The constant (α) of 70.205 means that if the learning discipline and self-confidence in the object of research are equal to zero, then the learning outcomes (Y) of students are 70.205.
b. The regression coefficient (b_1) which is 0.160 and positive, indicates that each one-unit increase in the discipline learn variable (X1) will cause an increase of 0.160 in student learning achievement (Y).
c. The Regression coefficient (b_2) is 0.070 and positive, indicating that each increase of one unit in the self-confidence variable (X2) will cause an increase of 0.070 in the learning achievement (Y) of students.
d. "e" is a factor that can influence other than those in the study. This means that there are other factors besides discipline learn and self-confidence.

F Test Results (Simultaneous)

This test aims to ensure the validity of the hypothesis about study discipline and self-confidence on learning achievement utilizing the F test with a confidence level of 0.05 to analyze it. The following table presents the analysis of the results of SPSS version 25:

Table 9. Simultaneous Test Results

ANOVA	
F	Sig.
13.215	.000

Table 9 shows that the count F value is 13.215, exceeding the Ftable value of 3.07, with a (Sig) value of 0.000, lower than 0.05. As a result, the decision for H0 is canceled, while H1 is approved. This means that both discipline learn (X1) and self-confidence (X2) have an influence on the learning achievement variable (Y).

Coefficient of Determination Results

This test is applied to determine the impact of discipline learn (X1) and self-confidence (X2) on learning achievement (Y). The results of the R2 test are presented below:

Table 10. R2 Test Results

Model Summary		
	R	R Square
Discipline Learn	.419	.175
Self-Confidence	.385	.141
Discipline Learn and Self-Confidence	.426	.182

Table 10 shows the coefficient of determination / (R Square) of 0.182 or 18.2% which indicates that learning discipline (X1) and self-confidence (X2) have an influence of 18.2% on learning achievement (Y), the remaining part is likely influenced by other aspects not included in this research.

Discussion

The discussion of this investigation will be briefly outlined below:

The Impact of Discipline Learn on Chemistry Learning Achievement

The regression test results for the conjecture evaluating the reaction of each independent variable on the dependent variable explained that the discipline learn variable (X1) obtained a sig value of 0.000, lower than 0.05. Then (H0) is rejected and (H1) is accepted, which means that the discipline learn variable (X1) has a partial reaction on learning achievement (Y). Discipline is a behavior that determines the success of a learner. Disciplinary behavior that is embedded in a person can form regular behavior so that everything that is done is in accordance with the desired plan. Through the discipline that is carried out, it can realize the conditions of a comfortable learning environment.

The Impact of Self-Confidence on Chemistry Learning Achievement

The regression test results for conjectures that evaluate the reaction of each independent variable on the dependent variable explain that the self-confidence variable (X2) gets a sig value of 0.000, lower than 0.05. Then (H0) is rejected, and (H1) is accepted, which means that the self-confidence variable (X2) has a partial reaction on learning achievement (Y). The need to have high self-confidence in a person can help get good learning achievement. A person who has self-confidence is generally able to have confidence that whatever steps he takes in his learning activities will produce satisfactory results later.

The Impact of Learning Discipline and Self-Confidence Simultaneously and Significantly on Chemistry Learning Achievement

The results of the F test estimate that the F value of 13.215 exceeds the F table value of 3.07 with a probability (Sig) of 0.000 low than 0.05. Then the decision on H0 is rejected, while H1 is accepted. The discipline learn factor (X1) and self-confidence (X2) together have a significant reaction on the learning achievement variable (Y). The R square result is 0.182 or 18.2%, which means that discipline learn (X1) and self-confidence (X2) together affect learning achievement (Y) by 18.2%. The remaining part is influenced by other variables not examined in this study. This conclusion is in line with the findings of previous research by (Rahmadhani et al., 2019) explaining that discipline learn and self-confidence together have a significant reaction on student learning outcomes in economic subjects. The amount of contribution made by discipline learn and self-confidence to learning outcomes is 13.3%.

Conclusions and Recommendations

Conclusions

The reaction of discipline learn and self-confidence on learning achievement, as described in the research findings and analysis, can be summarized as follows:

1. The reaction of discipline learn on student learning achievement in chemistry subjects is that there is a parallel reaction between discipline learn and student learning achievement with the coefficient of determination of discipline learn on learning achievement is 17.5%.
2. The reaction of self-confidence on student learning achievement in chemistry subjects is that there is a parallel reaction between self-confidence and student learning achievement with the coefficient of determination of self-confidence on learning achievement is 14.1%.
3. The reaction between discipline learn and self-confidence simultaneously on students' learning achievement in chemistry subjects is that it shows that the variables of discipline learn and self-confidence together have an reaction on students' learning achievement with a coefficient of determination of 18.2%.

Recommendations

In connection with the description above, in an effort to improve learning discipline and self-confidence in students, there are several recommendations that can be followed up as follows:

1. The study results show that discipline learn and self-confidence have a relationship / can affect student learning outcomes, so that the development of learning discipline and self-confidence of students can be used as a source of referral to enhance the quality of learning and student learning outcomes.
2. Educators are expected to be facilitators and motivators for students so that they can improve learning outcomes. This is because the educator is one of those whose role is to provide criticism, suggestions and positive feedback to students.
3. For further researchers, with the results of this study, it is hoped that it can perfect because the results of this research still have many shortcomings, and it is hoped that it can expand the scope such as based on factors that affect learning outcomes other than learning discipline andself-confidence, so as to add other variables that are more varied.
4. The questionnaire instrument for learning discipline and self-confidence can be combined with evaluation tests or intelligence tests of students so that they can know with certainty the mindset of students

according to the results obtained.

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