

# THE EFFECTS OF ANALYTICAL SKILLS AND PRIOR KNOWLEDGE ON STUDENT'S ARGUMENTATIVE WRITING ABILITY

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**Abstrak:** Penelitian ini bertujuan untuk mengetahui pengaruh analisis dan pengetahuan awal terhadap kemampuan menulis argumentatif siswa di Kelas XI SMA. Metode yang digunakan dalam penelitian ini adalah metode penelitian kuantitatif dengan desain pra-eksperimental dengan menggunakan pre-test, treatment dan post-test sebagai instrumen pengumpulan data. Penelitian ini dilakukan di Daaruttaqwa Islamic Boarding School Cibinong. Teknik sampelnya hanya menggunakan satu kelas yaitu kelas XI. Dan data tersebut dianalisis secara statistik dengan menggunakan uji beda berpasangan (paired sample t-test). Studi ini mengungkapkan peningkatan signifikan dalam skor pra-test dan pasca-test siswa, dengan peningkatan rata-rata 6.0333. Statistik kuadrat eta menunjukkan ukuran efek yang besar. Tabel sampel berpasangan menunjukkan perbedaan yang signifikan, menolak hipotesis ( $H_0$ ) dan menerima ( $H_a$ ). Hipotesis alternatif ( $H_a$ ) disetujui, menunjukkan bahwa pengetahuan analitis dan pengetahuan awal siswa mempengaruhi kemampuan menulis argumen mereka.

**Kata kunci:** Analisis, Pengetahuan Awal, Argumentatif, Menulis

**Abstract:** This research aims to investigate the effect of analytical and prior knowledge towards student's argumentative writing ability at Grade XI Senior High School. The method used in this study was quantitative research method with pre-experimental design by using pre-test, treatment and post-test as the instruments of collecting the data. The research was conducted at Daaruttaqwa Islamic Boarding School Cibinong. The sample technique used only one class of XI Grade. And the data was analysed statistically by using paired sample t-test. The study revealed a significant increase in students' pre-test and post-test scores, with a mean increase of 6.0333. The eta squared statistics indicated a large effect size. The paired sample ttable showed a significant difference, rejecting the hypothesis ( $H_0$ ) and accepting ( $H_a$ ). The alternative hypothesis ( $H_a$ ) was approved, indicating that students' analytical and prior knowledge affects their argumentative writing abilities.

**Keywords:** Analytical, Prior Knowledge, Argumentative, Writing

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## INTRODUCTION

When learning English, it means learning the basic language skills. There are four skills that students should be required, they are: speaking, listening, reading, and writing. In this study, the researcher chooses one of the basic skills, it is writing. (Azizah & Budiman, 2017) highlight the most prevalent challenge students face in writing, which is claiming knowledge. Furthermore, students entering higher education with weak literacy skills struggle to succeed in administrative literacy standards and academic writing, lacking the flair and elegance associated with philosophical, thoughtful, and analytical thinking. These challenges are influenced by students' backgrounds in

reading, educational experiences, and attitudes before entering university, as well as the curriculum's preference for systematic education over cognitive abilities (Pineteh, 2013). Writing is a crucial language skill for EFL practitioners and researchers, but many students feel overwhelmed when required to write on specific topics, lacking technical skills for acceptable English compositions. (Bani Younes & Salamh Albalawi, 2015). Academic writing includes various types, including expository, narrative, persuasive, descriptive, and argumentative essays.

Argumentative writing is a crucial aspect of academic competency development, often used as an indicator of learners' language proficiency in international tests like the GRE, TOEFL, and IELTS (Zhang, 2018). However, there are several challenges in argumentative essay writing, such as generating ideas, logical argumentation, and cohesion issues. Second-language researchers face rhetorical difficulties in writing argumentative essays, leading to ongoing discussions among researchers on writing these essays for university students (Salsabilah et al., 2023).

Argumentative writing is a challenging English skill that requires strict use of lexical and grammatical features, and students struggle to generate ideas and express their writing well, resulting in poor written expression and argumentative writing (Seyoum et al., 2022). Analyte studies show that even native English speakers struggle with argumentative writing, with problems such as writing shorter texts, insufficient content, failing to support the point of view, poor organization due to lack of knowledge about argumentative structure, and stylistic inappropriateness. Despite the importance of language skills, argumentative writing remains the most challenging for students (Jusoh et al., 2016).

Analytical ability is crucial for students to study, solve issues, and conduct investigations on the economic condition. It involves high-level cognitive duties such as forming plans, strategies, decisions, and problem-solving, while also distinguishing between concrete and abstract concepts (Ibnusina et al., 2021). Prior knowledge is essential for learning, as it provides a foundation for progress and regulates new information. Inaccurate prior knowledge can lead to misunderstandings and influence learners' perceptions of new information. To guarantee successful teaching and learning, it is critical to assess the nature of prior knowledge before the learning process (Diaz, 2017).

Writing ability is essential for producing outstanding quality essays, strengthening analytical and critical thinking skills needed for this type of essay and improving the argument's substance (Rubiaee et al., 2019). Previous research emphasizes the importance of critical thinking in essay writing, focusing on two major stages: theoretical and practical. Critical thinking is a regular mode of thinking that requires effort and engagement, involving mental tasks like problem-solving, assumption analysis, reasoning, assessment, investigation, and decision-making.

Asma (2018) states that critical thinking is a regular mode of thinking that requires effort and engagement. Analytical abilities are necessary for the process of critical thinking, enabling students to answer problems more specifically by connecting with relevant concepts and effectively expressing information by identifying connections between them (Mayarni & Nopiyanti, 2021).

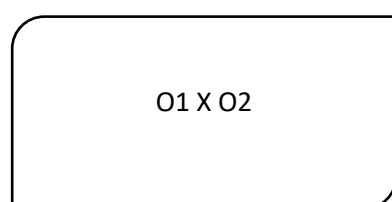
Previous research (Asma, 2018) used qualitative methods, such as collecting student questionnaires and conducting interviews with English teachers at the schools studied. However, this research will use a quantitative approach with pre-experimental design and paired sample t-test to investigate the issue of analytical skills and prior knowledge on student's argumentative writing ability.

The objective of the research is to find out whether the student's analytical and prior knowledge have effect on student's argumentative writing. To investigate the problem, the research question is proposed as follow: do the student's analytical skills and student's prior knowledge affects their argumentative writing?

## **METHODS**

This study used a quantitative approach with a pre-experimental method design, comparing pre-test and post-test results to determine if implementing students' analytical thinking and prior knowledge significantly improved their argumentative writing. One of the characteristics of qualitative research is analyzing data to describe the theme using text analysis and interpreting its meaning (Creswell & Creswell, 2018). The research involved one group (O1), exposed to treatment (X), and post-test (O2) to compare the results and determine if the treatments offered in class had a more significant effect on students' writing achievement. The aim was to determine if there was considerable improvement before and after implementing these strategies.

*The One-Group Pre-Test Post-Test Design Pattern*



Research Description:

Pre-Test (O1): Measurement before treatment.

Treatment (X): Treatment.

Post-Test (O2): Measurement after treatment.

## **Participants**

The data in this study came in the form of assertions of ideas or arguments that comprised aspects of critical thinking in sentences and paragraphs written by students, such as interpretation, analysis, inference, and assessment. The data sources of this study were argumentative essays written by 30 students of XI-A grade students of Daaruttaqwa Islamic Boarding School, Cibinong, Bogor, West Java. The research was conducted for about 2 months consisting of six meetings. In the first meeting, the researchers conducted the pre-test. For the second to the fifth meeting, the treatment was done by student's analysis to the topic given by the researcher. The last meeting was the post-test.

## **Data Collection**

The study employed three tests to gather data: pre-test, treatment, and post-test. The pre-test measured students' writing ability by allowing them to create an argumentative essay. The treatment involved explaining the importance of argumentative writing and providing a topic for students to analyze. The students then

had to create an argumentative essay based on their analysis results. The post-test assessed students' abilities after learning the treatment, assessing their understanding of argumentative writing. The students were required to produce another analytical argumentative essay on a new topic, assessing the impact of their analytical abilities on argumentative writing. The study aimed to evaluate the effectiveness of the treatment in enhancing students' writing skills.

### Data Analysis

The researcher used the A formula of t-test for one group, also known as paired sample t-Test, and SPSS in counting media to assess test findings. They used the normality distribution test to determine if a variable is normal, and the normalcy distribution test to validate data distribution. A dependent t-test was used to compare pre-test and post-test averages. The dependent test was calculated using SPSS Statistics for Windows version.

## RESULTS AND DISCUSSION

This chapter presents the results of the study and discussion result. It elucidates the writer's data analysis and discussion of the whole research. This study investigates the impact of Analytical and Prior Knowledge on students' argumentative writing abilities at Grade XI Senior High School. The research used a quantitative method with pre-experimental design, collecting data through pre-test, treatment, and post-test instruments. The sample consisted of 30 students from Daaruttaqwa Islamic Boarding School in Cibinong, Bogor, West Java. Pre-test scores were calculated using an objective test, while post-test scores were determined by taking similar tests after treatment. The study aimed to track students' progress in developing topic analysis skills by creating argumentation papers on selected topics. The data from pre- and post-tests were displayed before the t-test was calculated. After carrying out a pre-test, four treatments, and a post-test in class XI-A, the result showed that the majority of students achieved higher results. Two students had equal results (6.7%), 27 students received result increases (90%), while only one student received result decreases (3.3%).

After comparing pre-test and post-test results, students in the good category increased while those in the enough and poor categories fell, and those in the excellent category increased (see figure 1).

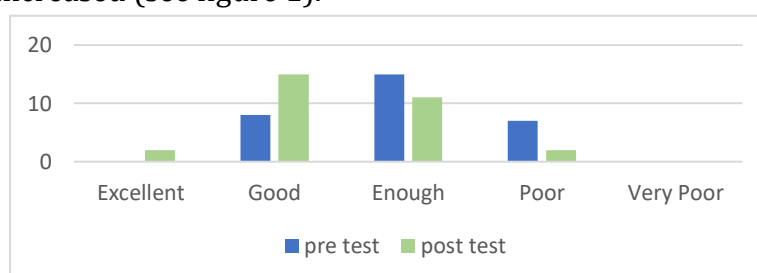


Figure1. Student's Pre-Test and Post-Test Comparison Chart

The mean was derived by averaging the students' pre-test and post-test results. The pre-test and post-test mean values were then compared to determine the

significance of the effect. Table 1 shows the mean findings for both pre-test and post-test.

Table 1. Mean of Pre-Test and Post-Test

	Mean	N	Std. Deviation	Std. Error
Pre-Test	71.46	30	8.122	1.483
Post-Test	77.50	30	8.148	1.487

Table 1. displays paired sample statistics, revealing a mean score of 71.46 in the pre-test and 77.50 in the post-test. N represents the total number of samples (30). The data was diverse before and after incorporating students' analytical and previous knowledge, with standard deviations of 8.12291 and 8.14841, respectively, and standard error means of 1.48303 and 1.48769. This finding demonstrated that students' analytical skills and prior knowledge had an impact on their argumentative writing abilities.

Table2. Paired Sample T-Test

		Paired Differences				t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
PRE-TEST	71.4667	8.12291						
POST TEST	77.5000	8.14841						
		-6.03333	3.63397	.66347	-7.39028	-4.67639	-9.094	.000

Table 2. showed the t-test findings, the results that were significant. The mean result was -6.03333, with a standard deviation of 3.63397, a standard error mean of 0.66347, a lower range of -7.39028 and an upper interval of -4.67639, a t-test result of -9.094, a degree of freedom of 29, and a 2-tailed significance level of 0.000 < a (0.05). If the significance score is less than a = 0.05, it may be inferred that the difference is significant, and it has been demonstrated that (Ho) was rejected and (Ha) was accepted, implying that the analytical and previous knowledge of students has a substantial influence on argumentative writing.

We conclude that the intervention significantly changed the students' capabilities based on these data. The results, however, do not indicate how much of an impact the intervention had. Doing an effect size statistics calculation is one technique to potentially do this. One of the most utilized effect size statistics, eta squared, is calculated and interpreted as explained in this section.

$$\text{Eta Squared} = \frac{t^2}{t^2 + (N - 1)}$$

t = (-9.094)  
N = 30

$$\frac{t^2}{t^2 + (N - 1)}$$

$$\frac{(-9.094)^2}{(-9.094)^2 + (30 - 1)}$$

$$\frac{(-9.094)^2}{(-9.094)^2 + (30 - 1)}$$

Eta Squared = .74

In order to determine the size of the effect, the researcher used the criteria of the effect size by (Fawad, 2020) which is shown in the table below.

Table 3. Effect Size Criteria

Effect Size	Criteria
.1	Low Effect
.06	Moderate Effect
.7	High Effect

Given the eta squared value of .74 the researcher can conclude that there was a large effect, with a substantial difference in the pre-test and post-test of analytical and prior knowledge towards student's argumentative writing.

The student's pre-test ( $M = 71.46$ ) and post-test ( $M = 77.50$ ) scores significantly increased, according to the results;  $t(29) = -9.094$ ,  $p < .001$  (two-tailed). The exam scores increased by 6.0333 on average, with a 95% confidence range that fell between -7.39 and -4.67. A significant impact size was shown by the eta squared statistics (.74). The paired sample  $t_{table}$  showed that the significant (2-tailed) value was  $0.000 < \alpha (0.05)$  and the  $t_{score}$  was -9.094. It is known that ( $H_0$ ) was rejected and ( $H_a$ ) was approved if the significance score is less than  $\alpha = 0.05$ . This indicates that the difference is significant.

## Discussion

This study investigates the impact of analytical and prior knowledge on students' argumentative writing abilities. The results show a significant difference in students' argumentative writing abilities, with a paired sample  $t_{table}$  score of -9.094, indicating a significant difference between the two groups. The alternative hypothesis,  $H_a$ , was accepted, indicating that students' analytical and prior knowledge significantly impacts their writing abilities.

The findings align with a previous study that found a strong correlation between critical thinking and essay writing, with students finding it beneficial. Teachers also highlighted the importance of critical thinking skills in essay writing, emphasizing decision-making, reasoning, problem-solving, analysis, and evaluation. Both students and teachers agreed that promoting critical thinking among students can enhance their essay writing proficiency (Asma, 2018; Marni et al., 2019). The findings align with a previous study that highlighted the correlation between critical thinking and essay writing, emphasizing the importance of decision-making, reasoning, problem-solving, analysis, and evaluation.

## CONCLUSION

Argumentative writing is a crucial skill in language proficiency, requiring coordination and balance of various processes. Mastering this skill is a significant challenge, as it requires linguistic and cognitive abilities. Academic writing is a complex process that involves analyzing, expressing information, thinking critically, and focusing on method and style. Argumentation is the process of constructing a statement and



supporting it with facts and logic, and prior knowledge is essential for argumentative essays. However, students often face problems in writing essays, including minimal interest, difficulty following writing stages, and a lack of analytical thinking and prior knowledge. The researcher aims to investigate the impact of analytical and prior knowledge on students' argumentative writing, focusing on idea generation, clear thesis statement development, essay outline, and general essay format. The study at Daaruttaqwa Islamic Boarding School Cibinong involved 30 XI Grade students, and the results showed a significant increase in students' ability in argumentative writing due to the addition of analytical and prior knowledge. The statistical analysis indicated a large effect size, indicating the significant impact of these factors on students' writing abilities. Based on these outcomes, the alternative hypothesis ( $H_a$ ) was accepted, indicating that students' analytical and prior knowledge affect their argumentative writing abilities.

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