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Critical Thinking Skills and Argumentative Writing Ability:Is there any Correlation?

Yulian Juita Ekalia[1*], Fransiskus Jemadi[2], Indra Susanto[3]
[1*,2,3]Pendidikan Bahasa Inggris, FKIP, Universitas Katolik Indonesia Santu Paulus Ruteng, Ruteng, Indonesia
Email: [1*]enuyulian@gmail.com, [2]fransiskusjemadi@gmail.com

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Abstract

This study explores the relationship between critical thinking skills and argumentative writing ability among eleventh-grade students at SMAK Fransiskus Xaverius Ruteng. In the Indonesian educational context, students often face challenges in producing well-structured and logically supported arguments, partly due to limited emphasis on critical thinking in traditional teaching methods. Argumentative writing requires not only language proficiency but also the ability to analyze, evaluate, and synthesize information. This research aims to determine whether a significant correlation exists between these two essential academic competencies. The study employed a quantitative correlational research design involving 30 students from the Language Program. Critical thinking skills were measured using the Watson-Glaser Critical Thinking Appraisal (WGCTA), while argumentative writing ability was assessed through a standardized writing test evaluated by a rubric. Data analysis using Pearson's Product-Moment Correlation and SPSS Version 25 revealed a very strong positive correlation ($r = 0.813$) between critical thinking and argumentative writing. The coefficient of determination ($R^2 = 0.661$) indicated that 66.1% of the variance in writing performance can be attributed to critical thinking abilities, while the remaining 33.9% is influenced by other factors such as language proficiency and prior writing experience. The findings confirm a significant positive correlation between critical thinking and argumentative writing, supporting the integration of critical thinking strategies into writing instruction. Students with higher critical thinking scores generally produced more coherent, logical, and persuasive texts. The study suggests that educators should incorporate techniques such as argument mapping, debates, and peer review sessions to enhance both cognitive and linguistic development.

1. INTRODUCTION

Writing is one of the fundamental language skills that plays a crucial role in both academic and professional development [1]. It is not merely a productive skill but also a complex cognitive process that involves organizing ideas, structuring thoughts, and conveying them coherently through written expression. According to [2], writing is a productive language activity that requires students' ability to compose and organize content effectively. This complexity makes writing a challenging skill for many learners, as it demands mastery of various linguistic elements such as grammar, vocabulary, coherence, and logical structure. Furthermore, writing is recognized as a productive language skill because it involves the active creation and construction of meaning through written language [3]. Unlike receptive skills such as listening

or reading, where learners process and interpret information, writing requires the learner to generate original content, express ideas, and communicate messages effectively to a specific audience [4]. This production of language demonstrates not only linguistic competence but also cognitive engagement, as writers must simultaneously manage grammar, vocabulary, syntax, and rhetorical strategies [5].

Moreover, writing serves as a means of knowledge construction and reflection, enabling learners to articulate their understanding, develop arguments, and refine their thoughts in a structured manner [6]. In academic settings, this skill is essential for completing assignments, conducting research, and presenting findings, while in professional environments, it supports clear communication, documentation, and decision-making processes [7].

Among the different types of writing, argumentative writing stands out as an important form of academic expression. An argumentative essay is persuasive writing that presents a claim, supports it with evidence, and discusses opposing viewpoints [8]. The main components include a clear thesis statement, supporting arguments, counterarguments, and a well-structured conclusion. This type of writing is usually utilized in educational settings to develop learners' reasoning abilities and their capacity to present logical, evidence-based arguments. Argumentative writing plays a crucial role in higher education because it fosters critical thinking, enhances analytical skills, and promotes intellectual independence [9]. Unlike descriptive or narrative writing, argumentative writing demands that students not only understand the topic but also take a position, support it with credible sources, and engage with alternative perspectives. This process mirrors academic discourse, where ideas are debated, challenged, and refined through reasoned argumentation [10].Topics often involve controversial issues, such as climate change, education reform, or public policy, requiring writers to critically analyze information and construct reasoned positions.

However, writing argumentative texts is not solely dependent on language proficiency. Writing argumentative text emphasize that successful writing also depends on higher-order thinking skills, particularly critical thinking [11]. Critical thinking refers to the ability to objectively evaluate information, question assumptions, consider multiple perspectives, and make reasoned judgments [12]. It is a key component in constructing sound arguments and avoiding logical fallacies [13].

Critical thinking enables students to assess sources, interpret data, identify biases, and synthesize information into coherent arguments. As stated by [14], critical thinkers are naturally curious, open-minded, and capable of withholding judgment while exploring alternative viewpoints. These traits are essential when crafting persuasive and logically structured essays. [15] reinforces this idea by noting that students who possess strong critical thinking skills tend to write more compelling and logically sound argumentative texts. They can defend claims with valid reasoning, refute weak arguments, and avoid errors in logic. In other words, critical thinking plays an essential role in argumentative writing by helping writers organize their ideas logically and coherently. It enables students to analyze information, identify key points, and structure their arguments in a clear and persuasive manner. Rather than presenting random thoughts or unsupported opinions, critical thinkers can evaluate the relevance and strength of ideas, allowing them to build well-organized essays that guide the reader through a logical progression of thought.

Moreover, studies have shown that critical thinking has a direct impact on the quality of argumentative writing. [16] argue that developing critical thinking skills allows writers to produce more persuasive and impactful arguments by analyzing information effectively, evaluating evidence critically, and building logical claims. Similarly, [17] found that critical thinking contributes significantly to the clarity, depth, and persuasiveness of argumentative writing. Thus, critical thinking serves as a foundation for creating informative, convincing, and valuable written work.

Given the interdependence between critical thinking and argumentative writing, understanding the relationship between these two skills becomes essential for improving students' academic performance. Research conducted by [18][19] confirms a significant positive correlation between critical thinking and argumentative writing abilities. These findings suggest that enhancing critical thinking skills could lead to better writing outcomes and vice versa.

In the context of Indonesian secondary education, where English is taught as a foreign language, students often face additional challenges in mastering argumentative writing. Another critical issue is seen from traditional teaching methods commonly used in schools across the region. These methods often emphasize drilling, memorization, and teacher-centered instruction rather than active student engagement or inquiry-based learning. As a result, students have limited opportunities to practice higher-order thinking skills such as analysis, evaluation, and synthesis—skills that are foundational to both critical thinking and effective argumentation. In this environment, students are rarely encouraged to question assumptions, explore

multiple perspectives, or construct their own reasoned opinions. This lack of exposure to critical thinking not only affects their cognitive development but also weakens their performance in academic writing tasks, particularly when dealing with abstract or controversial topics in English. In this environment, students are rarely encouraged to question assumptions, explore multiple perspectives, or construct their own reasoned opinions. This lack of exposure to critical thinking not only affects their cognitive development but also weakens their performance in academic writing tasks, particularly when dealing with abstract or controversial topics in English [21].

The integration of critical thinking strategies into writing instruction is essential to ensure that students not only master sentence construction and text structure but also develop analytical, evaluative, and creative thinking skills. In the context of education in Indonesia, the government has promoted the implementation of HOTS (Higher Order Thinking Skills) as part of the national curriculum (Curriculum 2013 and Merdeka Curriculum), aiming to improve the quality of education by fostering higher-level thinking abilities. HOTS includes four core components: analyzing, evaluating, creating, and reflecting —all of which are central to the process of critical thinking.

Argumentative writing instruction, especially in English, provides an ideal space for developing these skills. By encouraging students to identify claims, support arguments with evidence, and evaluate different perspectives, teachers can help learners build logical and systematic ways of thinking. This aligns with the vision of the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek), which aims to produce lifelong learners who are critical, innovative, and responsible.

The integration of critical thinking into writing instruction is essential. [22] highlight the importance of developing higher-order thinking skills (HOTS) through instructional strategies that promote analysis, synthesis, and evaluation. This aligns with the Indonesian Ministry of Education's recent curriculum reforms, which emphasize the development of HOTS across all subject areas [23]. Furthermore, research has shown that writing tasks that require students to engage in argumentation can serve as effective platforms for cultivating critical thinking. Writing argumentative essays encourages students to explore multiple perspectives, weigh evidence, and construct well-supported claims [24]. This dual focus on content and reasoning strengthens both cognitive and linguistic competencies [25].

Empirical studies support the view that there is a strong relationship between critical thinking and writing performance. For instance, Putri (2021) conducted a study at Aulia Cendekia Islamic High School in Palembang and found that critical thinking contributed 48.4% to students' argumentative writing ability [26]. This suggests that improving critical thinking skills can significantly enhance students' writing proficiency. Similarly, [27] reported a high correlation coefficient ($r = 0.787$) between critical thinking and argumentative writing skills among students at IAIN Bukittinggi. This indicates a strong positive relationship between the two variables and underscores the need for targeted interventions to improve both skills simultaneously. The significance of this relationship extends beyond academic performance. In today's information-rich world, individuals must be able to think critically and communicate effectively to navigate complex issues and make informed decisions [28]. Developing these skills early in education prepares students for future academic and professional challenges [29].

At SMAK Fransiskus Xaverius Ruteng, where this study is conducted, students are exposed to various writing tasks, including argumentative essays. However, anecdotal evidence and preliminary observations suggest that many students struggle with organizing their ideas logically and supporting their claims with credible evidence. It is shown by observing the recent classroom activities, teachers and researchers noted that most students tend to present only personal opinions without clear evidence or logical arguments. For example, in a writing assignment on a controversial topic such as "Should School Uniforms Be Abolished?", many students failed to construct a clear claim, support their arguments with relevant data or references, or consider alternative viewpoints.This may indicate a gap in critical thinking instruction or insufficient practice in argumentation. This study focuses on eleventh-grade students, as they are at a developmental stage where higher-order thinking skills are maturing. At this level, students are expected to engage in more complex reasoning and demonstrate greater autonomy in learning [30]. By examining the correlation between critical thinking and argumentative writing skills among these students, this research aims to contribute to the growing body of knowledge in language and education. In finding the correlation between critical thinking and argumentative, this research used the theory of Wason Glaser Critical Thinking Appriasal (WGCTA). The Watson-Glaser Critical Thinking Appraisal (WGCTA) is widely recognized as a reliable tool for assessing critical thinking skills [31]. This instrument evaluates five key dimensions: inference, assumption recognition, deduction, interpretation, and evaluation of arguments [32].

Using WGCTA in conjunction with a standardized rubric for assessing argumentative writing provides a comprehensive measure of both cognitive and linguistic abilities.

In conclusion, this study adds to the currently available body of research on education in Indonesia and provides empirical data that can be used to inform broader educational practices and policies aimed at addressing this crucial issue. Therefore, the authors would like to conduct a study on correlation between critical thinking skills and argumentative writing ability at senior high school particularly at SMAK Xaxerius Ruteng.

2. RESEARCH METHODS

This study employed a quantitative correlational research design to examine the correlation between critical thinking skills and argumentative writing abilities among eleventh-grade students at SMAK Fransiskus Xaverius Ruteng. Correlational research is suitable for investigating the degree to which two or more variables are related without implying causation [33]. In this case, the independent variable was students' critical thinking skills, while the dependent variable was their argumentative writing performance. Furthemore, this study employed a quantitative correlational research design to examine the relationship between students' critical thinking skills (X) and their argumentative writing abilities (Y) . This design was chosen to explore the natural association between the two variables without manipulating them, making it suitable for educational contexts where experimental control is not feasible. The goal was to determine how strongly critical thinking influences argumentative writing performance.

The population consisted of 202 eleventh-grade students from various academic programs, including Science, Language, and Social Studies tracks. The purposive sampling technique was chosen to select 30 students from Class XI Language Program 1 at SMAK Fransiskus Xaverius Ruteng based on specific criteria relevant to the study's goals. These students were selected because they receive more language and writing instruction, making them ideal for examining argumentative writing skills. The class was accessible due to logistical and administrative support, ensuring smooth data collection. Selecting participants from a single class also created a more homogeneous group in terms of curriculum exposure and English proficiency, improving consistency in the results. Although the total population includes 202 students across different programs, Class XI Language Program 1 was considered representative of the Language track based on academic performance and teaching context.Data were collected using two primary instruments: the Watson-Glaser Critical Thinking Appraisal (WGCTA) and an argumentative writing test. The WGCTA is a validated tool commonly used to measure critical thinking abilities through five dimensions: inference, assumption recognition, deduction, interpretation, and evaluation of arguments [36]. In addition, WGCTA typically, the standard WGCTA consists of multiple-choice questions only, with no essay component. The version referenced in this study is not explicitly specified (e.g., Form A or B), which are the most common standardized versions used in research and professional settings. Paragraph 71 mentions that the test comprises 40 items divided into multiple-choice and essay formats, scoring from 0 to 100. This deviation from the standard format suggests that the researchers may have adapted the instrument by adding an essay section to better align with the study's focus on argumentative writing. This modification likely aimed to capture a more comprehensive view of critical thinking in the context of written argumentation, although it deviates from the conventional WGCTA structure.The test consists of 40 items divided into multiple-choice and essay formats, with total scores ranging from 0 to 100 [37].

For the writing assessment, students were asked to compose an argumentative essay on a given topic. Their performances were evaluated using a rubric adapted from Brown (2007), which included five criteria: content, organization, grammar, vocabulary, and mechanics [38]. Each criterion was scored on a scale from 1 to 5, resulting in a maximum total score of 25, which was then converted to a percentage scale for consistency with the critical thinking test.

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) software. Pearson's product-moment correlation coefficient was used to determine the strength and direction of the relationship between critical thinking and argumentative writing scores [39]. The formula for Pearson's r is:

r = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{[N\sum X^2 - (\sum X)^2][N\sum Y^2 - (\sum Y)^2]}}
where:
- r is the correlation coefficient,
- N is the number of pairs of scores,
- X and Y are the individual scores for the two variables,
- \sum denotes summation.

The correlation coefficient values were interpreted according to established guidelines: very low (0.00–0.199), low (0.20–0.399), moderate (0.40–0.599), high (0.60–0.799), and very high (0.80–1.000) [29]. Additionally, the coefficient of determination (R^2) was calculated to determine the proportion of variance in argumentative writing explained by critical thinking skills.

This methodology provided a systematic approach to measuring and analyzing the relationship between critical thinking and argumentative writing, offering insights into how these skills interact in the selected student population.

3. RESULTS AND DISCUSSION

This research was conducted on February 3, 2025 on 30 students on eleventh grade of SMAK Fransiskus Xaverius Ruteng. In this study, the researcher gave a critical thinking test which consisted of 40 questions and argumentative writing test directly to students. The following table is the result of the critical thinking skill test (X) and the argumentative writing test (Y):

Table 1. The result of the critical thinking skill test (X) and the argumentative writing test (Y):

Variable	Min Score	Max Score	Mean	STD. Deviation	Category
Critical Thinking Skills (X)	47	89	70.5	11.524	Good
Argumentative Writing (Y)	52	96	76.5	12.516	Good

This table presents an overview of the performance of 30 eleventh-grade students from SMAK Fransiskus Xaverius Ruteng on two key academic skills: critical thinking and argumentative writing. The data was collected through standardized tests, analyzed using descriptive statistics, and categorized based on predefined scoring criteria. The purpose of this interpretation is to provide a comprehensive understanding of what these scores mean in the context of student learning, educational outcomes, and the relationship between critical thinking and writing ability.There are two variables in the table. The variables included in the table are: Critical Thinking Skills (X) : Measured using a standardized critical thinking test consisting of 40 questions. Argumentative Writing (Y) : Measured through a structured argumentative text writing test that assessed students' ability to construct coherent, logical, and persuasive arguments.

Both tests were administered to the same group of 30 students, ensuring consistency in sample size and reducing variability due to differences in population characteristics. The use of a uniform sample allowed for more reliable comparisons between the two skill sets.

The tests were scored out of 100, with higher scores indicating stronger performance. The lowest and highest scores achieved by individual students are recorded in the "Min Score" and "Max Score" columns, respectively. The "Mean" column reflects the average score across all participants, while the "Standard Deviation" indicates how spread out the scores were around the mean. Finally, the "Category" column provides a qualitative interpretation of the overall performance level based on established scoring intervals.

Furthermore, minimum and Maximum Scores of the critical thinking (X) is 47 and 89. These scores indicate a wide range of performance levels among students in terms of critical thinking abilities. A minimum score of 47 suggests that at least one student struggled significantly with tasks requiring analysis, evaluation, inference, and problem-solving—key components of critical thinking. In contrast, the highest score of 89 demonstrates that some students excelled in identifying logical fallacies, analyzing arguments, and drawing well-supported conclusions.

However, the minimum and maximum score of argumentative writing test is 52 and 96. Similar to critical thinking, there is a noticeable disparity in students' writing abilities. The lowest score of 52 falls into the "Poor" category, suggesting that at least one student had significant difficulties organizing ideas, supporting claims, or adhering to the structure of argumentative writing. On the other hand, the top score of 96 indicates mastery-level performance, where the student demonstrated strong rhetorical control, clarity, coherence, and persuasive reasoning. The wide gap between the lowest and highest scorers highlights the need for targeted instructional support, especially for those who scored below average. It also shows that when students possess strong foundational writing skills, they can produce high-quality argumentative texts even under test conditions.

Meanwhile, the Mean and Standard Deviation of the critical thinking are 70.5 and 11.524.A mean score of 70.5 places the group's overall performance in the "Good" category, which aligns with expectations for eleventh-grade students preparing for higher education. However, the standard deviation of 11.524

indicates moderate variability in scores. That is, while most students performed reasonably well, there were still some individuals whose scores deviated significantly from the average. This moderate spread suggests that: Most students have developed adequate critical thinking abilities. There remains room for improvement, particularly for those scoring below 60. Instructional strategies should be tailored to accommodate both advanced thinkers and those needing remediation.

On the other hand, the mean and the standard deviation of Argumentative Writing (Y) are 76.5 and 12.516. With an average score of 76.5, students generally demonstrated strong writing capabilities. The slightly higher mean compared to critical thinking may suggest that students were more familiar or comfortable with writing than with abstract reasoning tasks. However, the standard deviation of 12.516 reveals greater variability in writing scores than in critical thinking scores. This could imply that some students received more focused writing instruction or practice. Writing is more subjective and influenced by personal expression, leading to wider performance gaps. Students with strong grammar and vocabulary skills may have had an advantage. The larger standard deviation emphasizes the importance of individualized feedback and scaffolding to ensure all students reach proficiency.

The Correlation between Critical Thinking Skills and Argumentative

Text Writing Skill

To find out the correlation between critical thinking skill and argumentative text writing skill, the researcher uses the product moment correlation formula.

$$r_{xy} = \frac{n\sum xy - \sum x \sum y}{\sqrt{\{n\sum x^2 - (\sum x)^2\}\{n\sum y^2 - (\sum y)^2\}}}$$

There are several points which we need to complete from formula above. Those points are the number of respondent (n), the total number of Critical Thinking and argumentative text writing (xy), the total number of critical thinking (x), the total number of argumentative text writing (y), the square of critical thinking (x^2), the square of argumentative text writing (y^2).

Table 4.2 The Correlation between Critical Thinking Skills and Argumentative Writing Ability

NO	Students' Initial	X	Y	X^2	Y^2	XY
1	CJD	70	75	4.900	5.625	5.250
2	AKB	51	60	2.601	3.600	3.060
3	AFDAR	75	84	5.625	7.056	6.300
4	OM	65	75	4.225	5.625	4.875
5	APZA	76	77	5.776	5.929	5.852
6	AK	75	85	5.625	7.225	6.375
7	RASP	65	76	4.225	5.776	4.940
8	LAJ	80	96	6.400	9.216	7.680
9	MFJ	70	75	4.900	5.625	5.250
10	BA	89	88	7.921	7.744	7.832
11	SGN	47	52	2.209	2.704	2.444
12	YCJ	53	56	2.809	3.136	2.968
13	MAN	63	64	3.969	4.096	4.032
14	VKW	84	89	7.056	7.921	7.476
15	MKJ	62	64	3.844	4.096	3.968
16	ECV	88	89	7.744	7.921	7.832
17	MTY	87	88	7.569	7.744	7.656
18	FEN	66	56	4.356	3.136	3.696
19	YAI	88	88	7.744	7.744	7.744
20	EAKW	70	80	4.900	6.400	5.600
21	MCB	70	84	4.900	7.056	5.880
22	PGT	67	88	4.489	7.744	5.896
23	MRO	67	56	4.489	3.136	3.752
24	MEGM	80	92	6.400	8.464	7.360
25	RAD	84	92	7.056	8.464	7.728

26	APK	74	80	5.476	6.400	5.920
27	VTC	76	72	5.776	5.184	5.472
28	MTN	64	76	4.096	5.776	4.864
29	BCZ	56	75	3.136	5.625	4.200
30	EW	55	64	3.025	4.096	3.520
TOTAL N=30		∑X 2117	∑Y 2296	∑X²= 153241	∑Y²= 180264	∑X∑Y 165422

In using the Product Moment correlation formula, the researcher had classified the generated numbers based on calculations, making it easier to understand and analyze the obtained correlation. The classification could be seen in the following table.

∑X	=	2117
∑Y	=	2296
$(\sum X)^2$	=	2117 × 2117 = 4481689
$(\sum Y)^2$	=	2296 × 2296 = 5271616
$\sum X^2$	=	153241
$\sum Y^2$	=	180264
∑X∑Y	=	165422

$$r_{xy} = \frac{n\sum xy - \sum x \sum y}{\sqrt{\{n\sum x^2 - (\sum x)^2\}\{n\sum y^2 - (\sum y)^2\}}}$$

$$r_{xy} = \frac{30((165.422 - ((2.117)(2.296)}{\sqrt{\{(30)(153.241) - (2.117)^2\}\{(30)((180.264 - (\sum 2.296)^2)\}}}$$

$$r_{xy} = \frac{4962660 - 4860632}{\sqrt{(4597230 - 4481689)(5407920 - 5271616)}}$$

$$r_{xy} = \frac{102028}{\sqrt{(115541)(136304)}} = \frac{102028}{\sqrt{15748700464}}$$

$$r_{xy} = \frac{102028}{125493{,}82} = 0{,}813$$

$$r_{xy} = 0{,}813$$

Based on manual calculations using the Product Moment correlation formula, the obtained correlation coefficient (rxyr) is 0.813, indicating a very strong positive correlation between critical thinking skills (X) and argumentative writing skills (Y). This means that the higher a student's critical thinking skills, the better Students argumentative writing ability. According to Sugiyono (2013), a correlation value between 0.800 - 1.00 signifies a very strong and significant correlation. Similarly, calculations using Excel with the same formula yielded an rxyr value of 0.813, further confirming this strong correlation. Since 0.813 falls within the 0.800–1.000 range, it reinforces the conclusion that critical thinking skills have a significant and strong influence on students' ability to write argumentative texts.

In addition to using the product moment correlation formula, the researcher also consults the critical value of r table at a significant level of 5% below;

Table 4.3 Critical Value Table for Correlation r Product-Moment

s	Significance Level		N	Significance Level		N	Significance Level	
	5%	1%		5%	1%		5%	1%
3	0.997	0.999	27	0.380	0.487	55	0.266	0.345
4	0.950	0.990	28	0.374	0.478	60	0.254	0.330
5	0.878	0.959	29	0.367	0.470	65	0.244	0.317
6	0.811	0.917	30	0.361	0.463	70	0.235	0.306
7	0.754	0.874	31	0.355	0.456	75	0.227	0.296
8	0.707	0.834	32	0.349	0.449	80	0.220	0.286
9	0.666	0.798	33	0.344	0.442	85	0.213	0.278
10	0.632	0.765	34	0.339	0.436	90	0.207	0.270
11	0.602	0.735	35	0.334	0.430	95	0.202	0.263

12	0.576	0.708	36	0.329	0.424	100	0.195	0.256
13	0.553	0.684	37	0.325	0.418	125	0.176	0.230
14	0.532	0.661	38	0.320	0.413	150	0.159	0.210
15	0.514	0.641	39	0.316	0.408	175	0.148	0.194
16	0.497	0.623	40	0.312	0.403	200	0.138	0.181
17	0.482	0.606	41	0.308	0.398	300	0.113	0.148
18	0.468	0.590	42	0.304	0.393	400	0.098	0.128
19	0.456	0.575	43	0.301	0.389	500	0.088	0.115
20	0.444	0.561	44	0.297	0.384	600	0.080	0.105
21	0.433	0.549	45	0.294	0.380	700	0.074	0.097
22	0.423	0.537	46	0.291	0.376	800	0.070	0.091
23	0.413	0.526	47	0.288	0.372	900	0.065	0.086
24	0.404	0.515	48	0.284	0.368	1000	0.062	0.081
25	0.396	0.505	49	0.281	0.364	1.100	0.059	0.074
26	0.388	0.496	50	0.279	0.361	1.200	0.055	0.067
27	0.382	0.486	51	0, 175	0.058	1.300	0.052	0.060
29	0.352	0.476	52	0.172	0.046	1.400	0.049	0.053
30	0.349	0.466	53	0.169	0.044	1.500	0.045	0.046
31	0.0346	0.456	54	0.165	0.042	1.600	0.042	0.039

After the researchers consulted the critical value of r table above, at a significant level of 5% with N = 30 = 0.349. Based on the results of consultation with r table, it is evident that rcount is greater than r table (0.813 > 0.349). The use of N = 30 is common in statistical analysis due to the Central Limit Theorem, which suggests that with a sample size of around 30, the sampling distribution of the mean begins to approximate a normal distribution, even if the original data is not normal. This makes parametric tests like Pearson correlation more reliable. Additionally, N = 30 is often considered a practical minimum sample size for obtaining stable and meaningful results, and many statistical references provide critical values starting at this sample size, making it a standard reference point. At N = 30, the critical value for a 5% significance level is 0.36, meaning if the calculated correlation coefficient (r) is equal to or greater than 0.361, the correlation is considered statistically significant. The 5% significance level ($\alpha = 0.05$) is widely used because it provides a reasonable balance between sensitivity and control over Type I error the chance of falsely detecting a correlation when there is none and is a conventional threshold in many scientific fields for determining statistical significance.It can be concluded that there is a significant correlation between critical thinking skills and argumentative text writing skills, in eleventh grade students of SMAK Fransiskus Xaverius Ruteng.

To confirm the statistical significance of the Correlation between critical thinking skills and argumentative text writing skills at eleventh grade students of SMAK Fransiskus Xaverius Ruteng, hypothesis testing needs to be done by comparing the significance value (pp-value) of the analysis using SPSS 25 program. The following is a table of correlation results based on the SPSS program.

Table 4.4 The Correlation between Critical Thinking Skills and Argumentative Text

Correlations

		Critical Thinking Skills	Argumentative Text Writing Skills
Critical Thinking Skilss	Pearson Correlation	1	.813**
	Sig. (2-tailed)		.001
	N	30	30
Argumentative Text Writing Skills	Pearson Correlation	.813**	1
	Sig. (2-tailed)	.001	
	N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

Based on the SPSS analysis above, the correlation between the two variables significant (2-tailed) obtained the result of 0.001 <0.05. This means that there is a significance correlations between the critical thinking skilss andargumentative text writimg skilss, and the correlation coefficient is 0.813 (r table value).

Then, the researcher consulted the critical value of r tabel at a significant level of 5% with N = 30 = 0.349. Based on the results of consultation with r tabel, it is evident that r count is greater than r tabel (0.813> 0.349). It can be concluded that there is a significant correlation between critical thinking skills and argumentatitive text writing skills in SMAK Fransiskus Xaverius Ruteng students. The interpretation on manual calculations using the prduct moment correlatioan formula a correlation coefficient (r) of 0,813 was obtained. The result of Pearson correlation analysis showed is a very strong correlation between critical thinking skills and argumentative text writing skills (r = 0,813, p = 0,001). Since the p-value (0,001) is less than the siginificance level of 0.05 this indicates that, the alternative hypothesis (H_a) has been accepted, and the null hypothesis (H_0) has been rejected.

Therefore, it can be concluded that that critical thinking skills have a strong positive correlations with argumentative text writing skills at eleventh grade Students of SMAK Fransiskus Xaverius Ruteng. This suggests that Students with better critical thinking skills tend to demonstrate better argumentative writing abilities.

To determine the contribution of the independent variable (X) to the dependent variable (Y), the coefficient of determination (r2r^2) is used. Additionally, to measure the percentage of influence of critical thinking skills on argumentative writing skills, the R2R^2 (R-square) value is utilized.The results of this analysis are presented in Table below.

Table 4.5 The contribution of critical thinking to the skill of writing argumentative text

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.813[a]	.661	.649	6.82866

a. Predictors: (Constant), Y

The R Square value of 0.661 indicates that 66.1% of the variability in argumentative text writing skills (Y) can be explained by critical thinking skills (X). This means that the higher a person's critical thinking skills, the better their skills in writing argumentative texts. However, there is still = 33.9% (100% - 66.1% = 33.9%) variability that is influenced by other factors outside critical thinking skills.

Discussion

The findings of this study reveal a very strong positive correlation (r = 0.813) between critical thinking skills and argumentative writing abilities among eleventh-grade students at SMAK Fransiskus Xaverius Ruteng. The coefficient of determination ($R^2 = 0.661$) indicates that 66.1% of the variance in argumentative writing performance can be explained by critical thinking, highlighting its central role in academic writing development. These results align with theoretical perspectives such as those from [5]), who defines critical thinking as the ability to evaluate information objectively, question assumptions, and make reasoned judgments all essential components of constructing persuasive arguments. This suggests that students who engage in reflective and analytical thinking are better equipped to structure their ideas logically and support claims with evidence, which is crucial for effective argumentation.

Furthermore, [9] argue that critical thinkers are naturally curious, open-minded, and able to withhold judgment while exploring alternative viewpoints. These traits directly influence the quality of argumentative texts, as students must not only defend their position but also anticipate and refute counterarguments effectively. The high correlation found in this study supports these views, reinforcing the idea that critical thinking enhances both reasoning and expression in writing. Additionally, the use of the Watson-Glaser Critical Thinking Appraisal (WGCTA) as a theoretical basis further strengthens this connection [27], as it emphasizes five key dimensions of critical thinking — inference, recognition of assumptions, deduction, interpretation, and evaluation — all of which are vital in developing structured and logical written arguments.

This study's findings are also supported by empirical research such as [18], who reported a high correlation (r = 0.787) between critical thinking and argumentative writing among students at IAIN Bukittinggi. Similarly, [16] found that critical thinking contributed 48.4% to argumentative writing performance, although the contribution in the present study (66.1%) is even higher. This difference may reflect variations in instructional approaches or contextual factors such as curriculum emphasis on Higher-Order Thinking Skills (HOTS) in Indonesian schools. The growing importance of integrating critical thinking into writing instruction is evident, especially in educational contexts where argumentation plays a central role in academic success.

Despite the strong relationship observed between critical thinking and argumentative writing, it is important to acknowledge that 33.9% of the variation in writing performance remains unexplained. This suggests that other internal and external factors also play a role in shaping students' writing abilities. Internal factors include language proficiency, motivation, and prior writing experience, which significantly affect how clearly students can express complex ideas. For example, a student might think critically but struggle to convey their ideas due to limited vocabulary or lack of writing practice. External factors such as teaching strategies, classroom environment, and access to resources also contribute to writing development. Therefore, improving writing instruction should involve a multi-faceted approach that includes fostering critical thinking alongside linguistic competence and supportive pedagogical practices.

An interesting observation from the data is that some students performed better in writing than in critical thinking tests, and vice versa. This phenomenon underscores the multifaceted nature of writing and highlights the importance of developing both cognitive and linguistic competencies in tandem. It also calls for individualized assessment and instruction, especially in classrooms where students have diverse strengths and weaknesses. For instance, students with strong grammar and vocabulary knowledge may perform well in writing despite lower critical thinking scores, while others may excel in reasoning but struggle to organize their thoughts coherently in text.

In conclusion, this study affirms the theoretical and empirical link between critical thinking and argumentative writing. It supports the view that critical thinking is not just an ancillary skill but a core component of effective writing, especially when students are required to analyze, argue, and persuade. By grounding writing instruction in critical thinking strategies, educators can enhance students' academic performance and prepare them for future challenges in higher education and professional communication. Future research could explore specific interventions that integrate critical thinking into writing curricula and examine their impact on long-term writing development. Additionally, investigating the interplay between critical thinking and other factors like motivation, metacognition, and digital literacy may provide deeper insights into the complexities of writing performance.

4. CONCLUSION

The findings of this study reveal a very strong positive correlation ($r = 0.813$) between critical thinking skills and argumentative writing abilities among eleventh-grade students at SMAK Fransiskus Xaverius Ruteng. The coefficient of determination ($R^2 = 0.661$) indicates that 66.1% of the variance in argumentative writing performance can be attributed to critical thinking, underscoring its central role in academic writing development. Given this significant relationship, integrating critical thinking strategies into writing instruction becomes essential for improving student outcomes. This section outlines specific implications for teachers, students, and future researchers, offering practical and implementable suggestions.

For teachers, especially those teaching English or writing courses, it is crucial to design lessons that actively promote critical thinking alongside language skills. One effective strategy is the use of Socratic questioning during pre-writing activities. Teachers can guide students to ask questions such as "What evidence supports this claim?" , "Are there alternative viewpoints?" , or "How reliable is this source?" to encourage deeper analysis before writing begins. Additionally, debates and discussion-based learning can be incorporated to help students explore multiple perspectives and strengthen their ability to defend positions logically. These methods not only enhance argumentation but also develop reasoning skills necessary for high-quality writing.

Another useful approach is argument mapping, where students visually organize their arguments using graphic organizers. This helps them structure claims, supporting evidence, and counterarguments coherently. Teachers should also emphasize logical reasoning and fallacy recognition, explicitly teaching students how to identify errors in logic such as ad hominem attacks or straw man arguments. Furthermore, providing constructive feedback focused on both content and reasoning —not just grammar or vocabulary—ensures students understand how to improve the quality of their arguments. Integrating technology tools like Padlet, Google Docs, or peer review platforms can also support collaborative writing and critical evaluation of peers' work.

For students, developing self-regulated learning habits is key to improving both critical thinking and writing skills. They should engage in active reading, highlighting main ideas, evaluating sources, and identifying biases in texts they read. Keeping a reflective journal or blog where they write about what they have learned and how they apply it to their own writing can also foster metacognitive awareness. Students are encouraged to participate in peer review sessions, where they assess each other's writing based not only on grammar but also on the strength of arguments and use of evidence. Setting personal goals based on teacher feedback

and using rubrics that emphasize critical thinking criteria —such as clarity of argument, use of evidence, and consideration of counterarguments—can further support their growth.

For future researchers, this study opens up several directions for further investigation. Experimental studies could compare different instructional methods—such as inquiry-based learning versus traditional instruction—to determine which most effectively develops both critical thinking and writing skills. Researchers might also explore the long-term impact of integrating Higher-Order Thinking Skills (HOTS) into writing curricula, especially within the context of Indonesia's Curriculum 2013 and Merdeka Curriculum reforms. Investigating how digital literacy influences argumentative writing, particularly in terms of source evaluation and information synthesis, is another promising area. Comparative studies across educational levels—from junior high to university—could provide insights into developmental trends and inform curriculum design. Lastly, developing and validating new assessment tools specifically designed to measure critical thinking in writing contexts, rather than general critical thinking tests like WGCTA, would enhance the accuracy of future research.

In conclusion, this study affirms the theoretical and empirical link between critical thinking and argumentative writing. By integrating critical thinking strategies into writing instruction, educators can significantly improve students' academic performance and prepare them for success in higher education and professional communication. A holistic approach involving teacher-led strategies, student-centered practices, and research-informed interventions is necessary to fully harness the potential of critical thinking in enhancing argumentative writing skills.

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