



## Research Article

# Critical Thinking Patterns of First-Year Students in Argumentative Essay

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### Abstract

This study aimed to find out the critical thinking patterns of students in the argumentative essay, explain and explore students' arguments that contain critical elements. This study used the content analysis method. Data was obtained from argumentative essays written by first-year students of Brawijaya University who took Indonesian Language courses. The total of data was 90 posts. Data collection was done by assignments and interviews. Data was analyzed using data analysis procedures from Creswell of six stage is preparing and organizing, data exploration, using code, representing findings, interpretations, and validate the accuracy of the findings. Three critical thinking patterns were found in the student's essay, namely pattern I (Inference-Evaluation), and pattern II (Analysis-Evaluation), pattern III (Interpretation-Evaluation). In pattern two, there were four pattern variations while there was only one pattern in patterns I and III. The results of this study indicated that students' critical thinking patterns were oriented towards analytic thinking, namely analyzing various phenomena by revealing evidence and reasons to draw logical conclusions. The pattern found can be used as a reference for writing lecturers in developing students' critical thinking skills in higher education.

### Keywords:

critical thinking patterns, first-year students, argumentative essay

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## **Introduction**

The study of critical thinking becomes a central knowledge in higher education. Every element and discipline makes critical thinking a catalyst for students' intellectual abilities. Critical thinking skills in higher education can prepare students to be communicative, collaborative, creative, innovative, critical and analytical in thinking, and able to effectively solve real world problems (Živković, 2016). Many forms of critical thinking training given to students showed that critical thinking skills in higher education became a central goal in facing the industrial revolution (Kaya, et.al., 2018; Smith et al., 2019; Wilson, 2016).

Critical thinking is the ability to analyze situations or texts and make decisions based on that analysis. The researcher used writing and critical reading to develop and represent the processes and products of their critical thinking (Bean, 2011). For example, the students will be asked to write about familiar or unfamiliar texts and examine assumptions about texts held by different audience. Through writing and critical reading, the students think of ideas, problems; identify and challenge assumptions; and explore various ways of understanding. Critical thinking skills as mental activity is an invisible activity (Cottrell, 2017), but critical thinking skills can be known or measured through forms of activity such as speaking and writing. A person's ability to express ideas in writing reflects his thinking ability because thinking and writing are two activities that cannot be separated. Therefore, this study aimed to see the critical thinking patterns of students as contained in their argumentative essays.

Argumentation is a proposition to influence and convince others both verbally and in writing using evidence or an acceptable reason (Wahid & Marni, 2018). One form of argumentation is essay. To produce a critical argumentative essay, a guideline containing data, theory, phenomena, and problems are needed as a starting point for students to start their arguments. This guide is intended to avoid negative perceptions of students about critical thinking, such as the results of research that shows students' perceptions of critical thinking understanding tend to be negative concept of "critics" (Kanatli Ozturk & Schreglmann, 2018). Critical thinking not only gives negative arguments, but also provides positive solutions.

Critical thinking and argumentation are two different things. However, both of these originate from the same scientific family, namely informal logic so that it can provide pedagogical implications in higher education. The power of argumentation is a representation of critical thinking. Critical thinking is a cognitive ability that can make someone always try new ideas, prove and give reasons for all forms of argument. To practice critical thinking skills in higher education, increasing the focus on argumentation is the answer (Andrews, 2007).

Many researches related to critical thinking and argumentation in higher education have been carried out. Argumentation is used as a tool to measure

students' critical thinking skills (Stupple et al., 2017). The steps in the argumentation become a guideline in the measurement so that critical thinking and argumentation have a very close relationship. In Iran, critical thinking training was used as a tool to improve the ability to write medical students argumentation (Shahsavari & Shokrpour, 2016). Meanwhile, Iranian chemistry laboratory students designed their research in solving problems related to the phenomena they handled, both in defending their arguments and in refuting arguments to measure their critical thinking skills (Kadayifci, et.al., 2012). The three results of this study imply that critical thinking and argumentation can be a measure of cognitive ability to see academic developments in college. The relationship between these two variables is increasingly apparent when given argument mapping training and coupled with critical thinking training to improve students' reflective assessment skills (Dwyer, et.al., 2014). Thus, critical thinking can be assessed through argumentation and vice versa.

Indonesian language courses as a personality development course in higher education are the starting point for training students' critical thinking skills. The courses which are oriented towards academic writing activities are the right space in practicing these skills. This course was a subject that must be taken by first-year students in all faculties in Brawijaya University, Indonesia. In this course, students were required to be skilled in using Indonesian, both verbally and in writing based on language rules to hone their thinking skills.

To practice critical thinking skills, a stimulus is needed to explore students' ideas and concept. They need some kind of guidance or reading material so that they are directed in writing arguments based on the opinions and facts they build. This study used a writing guide containing reading material in the form of factual data, theories, and policies in accordance with each theme. Before writing, students read the guide and then determined which part they would use as the main topic to develop their argument. The phenomenon of their concern was explored more deeply based on the information they obtain, both from reading texts and from the knowledge they have before.

The activity of interpreting, analyzing, influencing, and evaluating as a form of critical thinking activity will appear in an argumentative essay as a form of student intellectual maturity. The series of arguments arranged in an essay will show how students process their thoughts so that they become critical because the process of arranging the elements that build critical thinking through the development of ideas and concepts in each phase they write. The arrangement of the arguments will form a pattern that describes the critical or not of the writing. No research has been found on critical thinking patterns in student writing. This is the difference between this research and previous research.

Based on the observations made on the argumentative essay writing skill of the first semester student, the weaknesses in expressing critical arguments in their writing was found. This was seen on how they start the discussion, provide evidence and reason in concluding, and provide solutions to every question they respond to. This was caused by the absence of argument discussion guides that use critical thinking patterns of students who still use simple argumentative discussion patterns. In fact, the power of argumentation writing depend on the degree of critical argument given. Some studies mentioned that students still had difficulty in writing argument essays. Students have difficulty in determining what is needed in the argument essay (Wingate, 2012). Student writing is still conventional and has not involved critical thinking elements (Liu & Stapleton, 2018). This was caused by the low ability of first-year students in writing by using new ways and patterns (Klimova, 2013). Therefore, this problem needs to be studied and discussed further so that it can lead students to write argumentative essay creatively by using critical thinking patterns properly.

### **Method**

This study used a qualitative approach with the content analysis method. The qualitative approach with the content analysis method was used in this study to get a detailed explanation and exploration of critical thinking patterns in argumentative essay written by students. One of the characteristics of qualitative research is analyzing data to describe the theme using text analysis and interpreting its meaning (Creswell, 2012). The qualitative approach was intended to describe, explain, and explore critical thinking patterns in student-written argumentative essay. Meanwhile, content analysis was used to examine ideas and concepts written by students that contained elements of critical thinking and placed these elements in their writing (Krippendorff, 1984).

### **Participants**

The data in this study were in the form of statements of ideas or arguments that contain elements of critical thinking contained in sentences and paragraphs written by students, namely interpretation, analysis, inference, and evaluation. The data sources in this study were argumentative essays written by first-year students who take Indonesian Language courses (Academic Writing) at Brawijaya University Malang, Indonesia. The respondents were 221 students from four faculties, namely the Faculty of Law, the Faculty of Mathematics and Natural Sciences, the Faculty of Marine and Fisheries, and the Faculty of Medicine. After reducing the argumentative essays from 221 students, it was found 90 essays that met the critical criteria. In qualitative research used for sampling is purposive sampling. The aiming sample is the researcher deliberately selecting individuals and places to study phenomena. The

standard used in choosing subjects and places is whether they are "rich in information" (Creswell, 2012).

### **Data Collection Tools**

Data in the form of argumentative essay documents written by students were collected by assignment. Students were asked to write argumentative essay based on the instrument given. Students choose one of three themes and read instruments based on the chosen theme. This theme was only intended for students to write according to their interests in the occurred phenomena. The selection of three themes was based on agreement and specialization of students by voting. The three themes or issues that were read were chosen because these three themes are a hot issue happening in Indonesia, namely the theme of illegal fishing, foreign workers, and curriculum change. By choosing one of the three themes, students will be challenged to hone their critical thinking skills because all three are so close to their daily lives.

### **Data analysis**

The data analysis procedure in this study consisted of six stages, namely (1) preparing and organizing data for analysis, (2) conducting initial data exploration through the coding process, (3) using code to develop a more general description of the data description and theme, (4) representing findings through narration and visuals, (5) making meaning interpretations of the results with personal reflection on the impact of the findings and literature that might inform the findings; and finally (6) validate the accuracy of the findings (Creswell, 2012).

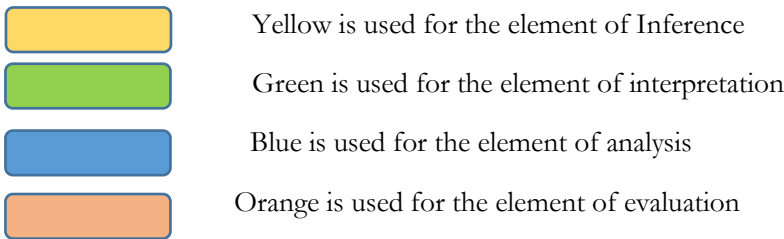
## **Results**

Based on the results of the analysis, three general patterns and four sub-patterns in pattern II were found in the student writing. In general, the argumentative writing began with three elements of critical thinking, namely inference, analysis, and interpretation. At the end of the writing, the closing argument used the critical thinking element, namely evaluation. The interesting thing about this finding was the variation of critical thinking elements used in the contents of the student essay. In the content section, a variety of critical indicators can be seen in how students properly process their arguments in explaining the evidence and the reasons for drawing conclusions.

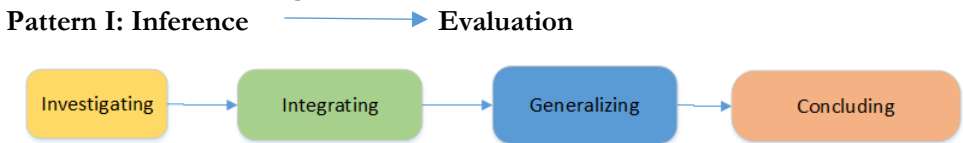
**Table 1.**  
*Data Obtaining Containing Critical Thinking Elements*

Number of data sources	Pattern found	Elements of Critical Thinking	Data obtaining
	Pattern I	Inference-interpretation-analysis-evaluation	7
90 argumentative essay	Pattern II-a	Analysis-inference-Interpretation-evaluation	22
	Pattern II-b	Interpretations-analysis-analysis	25
	Pattern II-c	Analysis-inference-evaluation-interpretation-evaluation	16
	Pattern II-d	Analysis-evaluation-interpretation-evaluation-inference-evaluation	12
	Pattern III	Interpretation-analysis-evaluation-interpretation-inference-analysis	8
<b>Total data</b>			90

To look the details of patterns contained critical thinking elements in this article, they are shown with different colors. Each of the color descriptions is as follows.



**Figure 1.**  
*Color hints at critical thinking elements*



**Figure 2.**  
*Pattern I Inference-Evaluation*

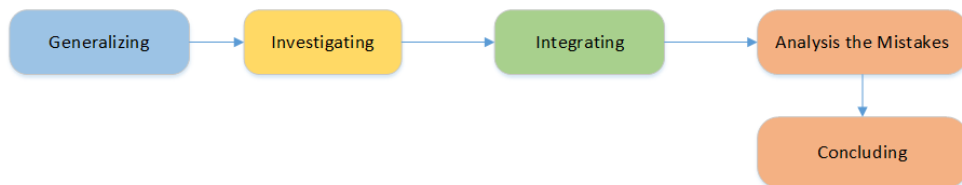
Pattern I is a simple pattern of critical thinking. It can be seen in Figure 1 that in the students’ argumentative essays, begins with an inference element, students investigated the problem by providing valid evidence. The evidence was used as the basis of the argument and the evidence was interpreted by integrating it. In integrating activities, students described the relationship between the available evidence and described the effects or certain consequences of existing problems (Marzano & Kendall, 2007). After strengthening the argument by providing evidence, students generalized and drawled conclusions. From this pattern, it

appears that students had represented their critical thinking through arguments written in the form of essays. Although, the element of critical thinking that appears in this one pattern still looks simple, students had fulfilled the four elements that build critical thinking, namely inference, interpretation, analysis, and evaluation (Marzano & Kendall, 2007).

### Pattern II: Analysis → Evaluation

In pattern II, there were found patterns of analysis. Students began their argument with the element of analysis, which was analyzing the problem by generalizing. There were four sub-patterns found in this pattern II. The differences of the four subpoles were the element of critical thinking in the contents of the writing, while the opening and closing equally describe analysis and evaluation. Their writing began with a generalized analysis, while the closing section contained an evaluation by analyzing errors and drawing conclusions. The following was a description of each subpole II.

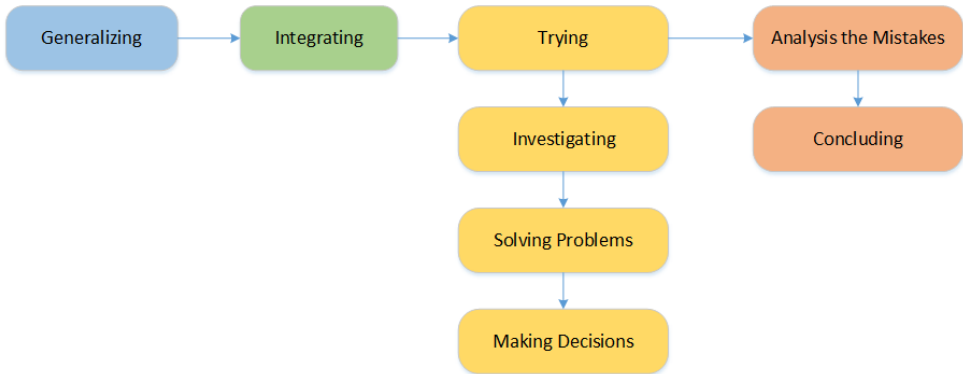
#### Pattern II-a



**Figure 3.**

#### *Pattern II-a Analysis- Evaluations*

Pattern II-a which begins with analysis and develops patterns in the evaluation section with the appearance of two elements of evaluation, namely analyzing errors and drawing conclusions. In this pattern, students began their arguments with analysis statements that were reinforced by inference (investigating). Then interpretation (integrating) or describe the process or reason of the phenomenon discussed and conclude by analyzing errors and drawing conclusions. Critical thinking was characterized by the sharpness of the argument in evaluating the issues discussed.

**Pattern II-b****Figure 4.***Pattern II-b Analysis- Evaluations*

In sub pattern II-b it shows that at the beginning of the student's writing, there is an element of analysis. Students generalized the problems / phenomena discussed, namely starting their arguments by describing the general principles of the chosen theme. Then, they strengthen the general picture by interpreting it. The sub-indicator of the interpretation that arises was integrating. The type of activity was describing the process and reason for something, describing the key elements of information, describing the effects or certain consequences, describing the relationship between information with one another, explaining ways or steps, linking information with other things, paraphrasing, and summarizing (Marzano & Kendall, 2007). The interesting thing in this finding was the variation in the inference section. There were four inference subindicators that appear in student writings, namely trying, investigating, solving problems, and making decisions.

Inference includes 3 things (Facione, 2015), as follows. (1) Proof of writing. It means that there is an opinion to support other people's opinions and find a place of support finding to find the right information. (2) Alternative solutions to problems. It means that formulating several alternatives to solve problems, to postulate a series of assumptions about questions, to project alternative hypotheses about an event, to develop various different plans to achieve several objectives; draw prejudices and project the various possible consequences of decisions, positions, policies, theories, or beliefs. (3) Basic conclusions. it means that applying the right inference model in determining the position, opinion or point of view, which must be taken on a particular problem; provide a set of statements, descriptions, questions or other forms of representation, to be circulated, with the right level of logical power, their inferential relations and their consequences or presuppositions that they support, represent, imply or appeal; determine which of the several conclusions that



may be the most guaranteed or supported by the evidence that exists, or which should be rejected or deemed unreasonable by the information provided. This pattern ends with evaluation by analyzing errors and drawing conclusions.

### Pattern II-c

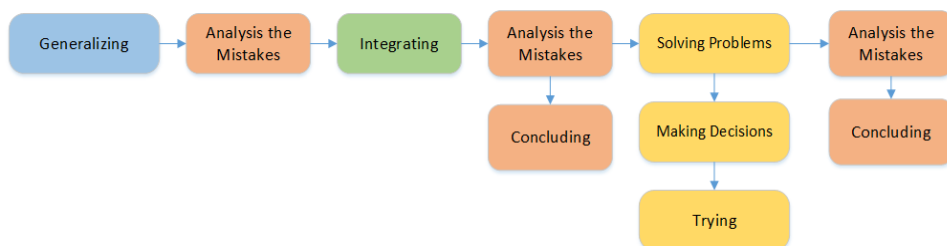


**Figure 5.**

#### *Pattern II-c Analysis-Evaluations*

In contrast to pattern II-b, in pattern II-c the contents of the essay contain elements of evaluation. That means in this pattern, students had begun to be more critical in expressing their arguments. This could be seen when starting the writing with analysis by generalizing the problem discussed, then describing it in depth (investigating) and reevaluating the arguments that have been described. After being evaluated, it was integrated by describing the key elements of information and drawing conclusions. In this pattern, there was a repetition of the evaluation element. This shows that the ability of students to process critical thinking was developed because people who think critically will evaluate and then conclude things based on facts to make decisions (Dwijananti & Yulianti, 2010).

### Pattern II-d



**Figure 6.**

#### *Pattern II-d Analysis-Evaluation*

Pattern II-d has developed a critical thinking pattern from the previous pattern. In this pattern, the evaluation element dominates. Every other pattern (analysis, interpretation and inference) is always clarified by the element of evaluation. This shows that in critical thinking through argument writing, students are more likely to analyze errors, both facts and opinions, from the phenomena discussed. The argument that begins with this element of analysis is clarified by evaluation and then confirmed by problem interpretation (integration). The next is evaluated by analyzing errors and drawing conclusions. In the next section, the statement did not stop at a tentative conclusion. However, it is clarified by the element of inference. In the inference section (solving problems, making decisions, trying), students try to

explore their arguments before drawing final conclusions. Critical thinking skills is an activity of identifying differences in information, analyzing information and formulating hypotheses, evaluating evidence and finally finding solutions to problems discussed (Afify, 2019).

**Pattern III: Interpretation** → **Evaluation**



**Figure 7.**

*Pattern III Interpretation-Evaluation*

Pattern III is a form of critical thinking in student writing which begins with an element of interpretation. This pattern shows that the elements of interpretation and evaluation dominate. The power of critical thinking can be seen from how students rank critical elements in their writing according to the development of ideas through sharp analysis, reason and strong evidence to draw conclusions. From pattern III, it appears that the interpretation ability of new students was limited in integrating even though an indicator does not emerge, namely symbolizing. However, this does not reduce the criticality of their writing because in principle critical thinking was a directed and clear process used in mental activities such as solving problems, making decisions, persuading, analyzing assumptions, and conducting scientific research (Johnson, 2002).

This pattern is similar to pattern II-d because there are six critical elements. However, there was more variation in subindicators in pattern II-d so that it appeared that pattern II-d described a denser essay of critical arguments. The difference was in the opening argument. The pattern II-d began with an element of analysis, in pattern III began with an element of interpretation. The weakness is the element of analysis that appears is only limited to generalization, both when it appears at the beginning of the writing and in the contents of the writing.

## Discussion

From the results of the analysis above, the variation of critical thinking patterns contained in the argumentative essay of early semester students from various faculties in Universitas Brawijaya, Indonesia showed a unique and critical variety. Even though the first-year students face academic writing courses, this has demonstrated patterned writing skills. The elements of critical thinking were found in each of their written statements. The elements of critical thinking were clearly stated so that students could provide solutions and solve problems based on the phenomenon or problem they choose. Students will be free to undergo the academic process because critical thinking is an important component in any academic program (Carter, et.al., 2017). With critical thinking, students can respond to various

problems themselves and their communities in accordance with the competencies and scientific fields they do by identifying problems, synthesizing, analyzing and then providing solutions. In addition, critical thinking is a way for someone to improve the quality of thinking using systemic techniques of thinking and produce intellectual thinking in ideas initiated.

The patterns found can answer this research problem related to the quality of students' argumentative essay writing. The existing pattern aroused because the stimulation given was in the form of readings containing phenomena or problems that were happening in Indonesia. The reading aroused the students' critical mind to organize their arguments and write them down in the essay. In addition, writing instructions serve as benchmarks in guiding students to be able to explain arguments critically. Writing instructions or instruments are very important in producing quality writing (Cheong, Zhu, Li, & Wen, 2019; Mohammed & Cunningham, 2019; Stewart, 2019; Yu et al., 2019). With the given instrument, students were more focused in displaying their arguments critically. Essays that range in length from 7 to 10 paragraphs were arranged based on students' understanding and interest in the given phenomena. They were free to choose three of the readings that have been provided and then they respond in the form of argument essays. Taking new issues and making them as learning materials is more interesting for students than learning is only focused on theory (Borglin, 2012) so that choosing reading that can stimulate students' critical thinking skills contextually was considered more suitable for this research.

The essay writing was done in their class for two hours. Students worked on time without obstacles because they could understand writing instruments clearly. The authenticity of their ideas could be accounted for because they read, wrote, and thought at the same time and place. An important note in this argument essay was how they could provide data, evidence, and the right reasons so that they could draw conclusions in the end correctly. The sharpness of their analysis of the phenomenon that occurred would enrich their critical vocabulary in writing the argument. When students are able to analyze objectively and evaluate problems well, critical thinking skills will greatly support their academic performance (D'Alessio, Avolio, & Charles, 2019). The results of this study add to the treasury of knowledge related to how students can write critically in a patterned and structured manner. This can be used by teachers in teaching academic writing courses, especially the type of argumentation writing in the form of essays.

The diversity of emerging patterns shows that early semester students have been able to represent their critical thinking through argumentative essays. It is evident that argumentation is a space to practice critical thinking skills (Andrews, 2007; Joiner & Jones, 2003; Kadayifci et al., 2012). Although the critical thinking element does not appear as a whole in the essay, it does not affect the substance of the critical

content of the student's writing. The four elements of critical thinking, namely inference, interpretation, analysis, and evaluation appear in each pattern in various positions. The more often the critical thinking elements contained in the argumentative essay, the more sharp the student's argument will be in solving problems and providing solutions.

From the variety of existing patterns, the analysis dominates the elements that often appear at the beginning of the writing or also called as the opening part of the essay. In the Evaluation pattern, four sub-patterns emerged and most students wrote argumentative essay with this pattern. The analysis element becomes the main focal point in initiating argumentative essay for students. This was in line with the statement that critical thinking is analytic thinking, which a way of thinking that focuses on the process of analysis of various things (Donosoepuro, 1993). By building an argument, students must understand the problems that exist, think about how to connect problems with previous knowledge, and continuously reflect on each step to the conclusion process (Chores, et.al., 2009).

Critical thinking is a skill in solving problems and drawing conclusions. At the end of the students' argumentative essay pattern, there was an element of evaluation. In this section, students had been able to express arguments by analyzing errors and drawing conclusions. Evaluation was a skill to distinguish between strong and relevant arguments and weak or irrelevant arguments (Watson, et.al., 2002). Before evaluating, students sharpen their analysis of the issues discussed based on their prior knowledge and based on the information they get so that they can assess the relevance or failure of the arguments they provide and conclude with a logical conclusion.

This analysis skill is a manifestation of students' critical thinking. When they are accustomed to analyzing the problems around them, this will sharpen their intellect in assessing and concluding many things. Writing activities will further open their horizons to sharpen their knowledge and expertise. In any course, academic writing activities become a way to develop students' critical thinking skills. As a first step, Indonesian language courses become compulsory subjects, which include displaying opinions, both in verbal and in writing using Indonesian language rules. By this ways, students have known how to give logical opinions, provide facts, and sharpen opinions so that they can provide solutions and suggestions and explore their thoughts.

## **Conclusion**

Based on the findings and discussion, it can be concluded that critical thinking patterns in the argumentative essay of Universitas Brawijaya Indonesia students were oriented to analytic thinking, which was more likely to analyze the phenomena around them by exposing evidence and reason so that they can provide solutions

according to the information and knowledge they get. Their idea began by analyzing existing phenomena based on the problems they chose from the instruments given. The six patterns found provide a new alternative in writing learning to train students' critical thinking skills. This pattern can be used as a reference in writing in college, especially writing argumentative essays. This pattern can be developed for other types of writing and requires further research in order to explore students' critical thinking skills through academic writing activities.

The results of this study can be used as a reference for further research in developing critical thinking patterns in writing argument essays, both in different samples, such as in final year students and graduate students or in other types of argumentation writing, such as research reports. In addition, instructors of academic writing courses can use this pattern in practicing students' critical thinking skills on an ongoing basis through argumentation writing activities



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