CRITICAL THINKING-RELATED CHALLENGES TO CRITICAL WRITING: A CASE AT A PRIVATE UNIVERSITY IN INDONESIA

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By

Syifa Yulyani

21421018

English Language Education Study Program

Faculty of Teacher Training and Education

La Tansa Mashiro University

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APPROVAL SHEET

CRITICAL THINKING-RELATED CHALLENGES TO CRITICAL WRITING: A CASE AT A PRIVATE UNIVERSITY IN INDONESIA

By

Syifa Yulyani

21421018

Approved on 07th of October 2025

By the Consultant Team

Primay Supervisor	Co-Supervisor
Siti Hanna Sumedi, M.Pd	**Reni Apriani, M.Pd**
NIDN. 0406129503	**NIDN. 0426049105**

RATIFICATION SHEET

CRITICAL THINKING-RELATED CHALLENGES TO CRITICAL WRITING: A CASE AT A PRIVATE UNIVERSITY IN INDONESIA

By:

Syifa Yulyani

21421018

Defended before the Board of Examiners on 02nd of October, And Declared Acceptable

Board of Examiners

Primary Supervisor	: Siti Hanna Sumedi, M.Pd	(.....)
Examiner 1	: Hikmah Pravitasari, M.Pd	(.....)
Examiner 2	: Nurul Afiyattena, M.Pd	(.....)

Rangkasbitung, 7 of October 2025

English Language Education Study Program

La Tansa Mashiro University

Head of Study Program,

Hikmah Pravitasari, M.Pd.

NIDN. 0419119002

STATEMENT OF WORK'S ORIGINALITY

I honestly declare that this thesis, which I have written, does not contain the work or parts of the work of other people, except those cited in the quotations and references, as a scientific paper should.

Rangkasbitung, 05 October 2025

The Writer,



Syifa Yulyani

21421018

MOTTO

"So, remember Me, I will remember you"

(QS. Al-Baqarah:152)

DEDICATION

Allhamdulillah, with pride and happiness, I express my gratitude and thanks. The writer dedicates this thesis to:

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ABSTRACT

This study aimed to investigate the challenges related to critical thinking in critical writing faced by undergraduate students at a private university in Indonesia. The study used a qualitative case study approach, collecting data through documentation of student essays and semi-structured interviews with five participants. The study used interactive data analysis by Miles et al (2020), analyzing data through data condensation, data display, and drawing conclusions. The findings revealed that students experienced challenges in four key aspects of Chaffe (2010). Specific issues included challenges in recognizing contextual meaning, challenges in evaluating the validity and soundness of arguments, challenges in understanding disjunctive syllogisms, and challenges in identifying a thesis. The results of this study indicate that critical thinking skills need to be explicitly integrated into critical writing instruction. Writing instruction should not only focus on linguistic and structural aspects, but should also emphasize the ability to reason, analyze evidence, and understand implied meaning. Lecturers need to design learning activities that encourage students to think reflectively and analytically. Furthermore, the curriculum should support the development of critical thinking skills through a step-by-step approach, from recognizing arguments to constructing valid and sound arguments. By implementing this strategy, higher education institutions can strengthen students' critical literacy, enabling them to produce more logical, coherent, and academically valuable writing.

Keywords: Critical thinking, Critical writing, Case study, Higher education

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Generally, critical thinking is essential for effective writing. In an educational context, critical thinking is crucial for students to share their thoughts and information through clear and informative writing. Critical thinking not only improves the clarity of written expression but also fosters deeper understanding and engagement with complex concepts, making it a crucial skill for students navigating today's information-rich environment (Pramonojati et al., 2020) . In many cases, writing skills often suffer without critical thinking. This means that critical thinking in writing is essential for conveying ideas and thoughts convincingly and openly. Students with higher levels of critical thinking demonstrate significantly better writing skills (Fahim and Haghani, 2021). Similarly, Javed and Aslam (2023) emphasize that integrating critical thinking into learning activities improves students' capacity to generate logical arguments and produce more coherent academic writing. Therefore, when students are accustomed to expressing ideas and examining a topic from multiple perspectives, their writing will be more in-depth and robust, thus, critical thinking and writing are interconnected.

Critical thinking and writing are essential skills for analyzing a topic or information in depth. The relationship between these two skills can produce high-quality and intellectually relevant academic writing. In every country, writing is one of the key elements in language learning. Regardless of whether a high school student or a university student, this skill is the main focus of language learning

(Amhar et al., 2022). Writing not only develops learners' ability to communicate ideas clearly but also enhances critical thinking and academic performance. It serves as a foundation for mastering other language skills, such as reading and speaking. According to Hamied & Emilia (2020), writing competencies are covered syllabus-wise from the primary to tertiary level of education. Ideally, with this very long process, the students' writing should meet the common requirements, including acceptable grammar, conventions, and lexical choices. In addition, critical thinking helps students evaluate various sources objectively and integrate various perspectives into written narratives. Likewise, the result of writing is not only informative but also shows the extent of understanding of writing practices in academic standards. In the digital world, critical thinking has become an essential skill for students, involving problem-solving abilities that are essential for achieving success in technology-driven fields (Sukkamart et al., 2025). In an academic context, this is very important to demonstrate intellectual capacity and in-depth analytical skills on a topic. Therefore, critical thinking cannot be separated from the process of quality writing.

Critical thinking is the main foundation for developing critical writing skills. Students are required not only to convey information but also to be able to analyze, evaluate, and interpret various sources in depth. Critical writing at this level requires students to build logical arguments, consider various points of view, and compose writing that is not only based on opinion but also supported by strong academic evidence and references. Pu (2021) stated that one of the important standards for evaluating the quality of student writing is to think critically. It means every writing

that is produced from critical thinking will have an impact on every writing. Critical thinking is not only vital for academic success but also serves as a catalyst for innovation and problem-solving in real-world contexts (Qi et al., 2025). Critical thinking teaches people to question assumptions, assess evidence, and make logical decisions. Therefore, critical thinking provides people with the flexibility and creativity necessary to adapt to complex and rapidly changing environments. On the other hand, applying metacognitive strategies, such as planning, monitoring, and reflection, can improve students' critical thinking skills in writing arguments and understanding texts (Liu, 2020; Muhid et al., 2020). Therefore, every critical writing requires creativity to present meaningful writing, and critical thinking is one of the main standards in writing.

Furthermore, the importance of critical thinking and writing is found in a study by Khalil & Hellalet (2024) in Morocco regarding the integration of critical thinking skills. The teachers used a variety of strategies to improve critical thinking skills in writing classes. The teachers also use several pedagogical approaches in writing classes, such as providing open-ended questions, collaborative conversations, and using structured exercises to develop students' critical thinking. Therefore, the importance of critical thinking skills in improving students' argumentative writing skills and preparing them for future academic and real-world problems is justified. Furthermore, Rahmat et al. (2022) address the issue of how the academic writing process can foster the development of critical thinking skills. The findings of the study indicate that although students generally understand the stages of the writing process, namely planning, translating, and reviewing, the

review stage, which is in line with writing stages, most of these stages cannot be applied effectively without critical thinking exposure. Accordingly, this study emphasizes that writing and critical thinking are interrelated processes; hence integrating both skills in the classroom learning process can improve students' analytical skills and writing outcomes.

Based on the results of the pre-observation at a Private University in Indonesia, students have a fairly good level of linguistic knowledge and writing skills. In writing classroom practice, students are able to write using appropriate vocabulary, form regular paragraphs, and use structured sentences. However, the researcher found quite significant difficulties faced by students, including students having difficulty in determining interesting topics. The topics chosen tend to be general. During writing practice, students also have difficulty in developing an idea. In this context, the ideas conveyed are too general due to the lack of deeper thinking and exploration. Students also tend to repeat the same ideas or topics in several writing practices. This shows that they can write well but still need guidance to improve their quality of critical thinking in writing, especially in critical writing. Therefore, the challenges related to critical thinking in critical writing must be explored further.

Moreover, this prior study aims to investigate students' challenges in critical thinking related to critical writing. In the previous studies, most of them focused on investigating the implementation and correlation of critical thinking in writing (Khalil and Hellalet, 2024; Rahmat et al., 2020). Since there were no such previous studies that specifically focused on the challenges of critical thinking related to

critical writing, hence this study will fulfill the gap. Therefore, this prior study will focus on the importance of investigating the challenges of undergraduate students at a private University. In this prior study, the undergraduate students who are the main subjects in critical thinking practices applied to Critical Writing will be assigned to reveal a comprehensive understanding, and challenges related to critical thinking in critical writing activity, performance, and development of students at a private university in Indonesia.

1.2 Identification of the Problems

Based on the background of the study above, the following problems have been identified:

1. Students have difficulty in determining interesting topics;
2. Students tend to develop ideas that are too general.
3. Students also tend to repeat the same ideas or topics in several writing practices.

1.3 Limitation of the Problems

In terms of limitation of the problem, the researcher limited the study to investigate students' challenges of Critical Thinking related to Critical Writing at a Private University in Indonesia.

1.4 Formulation of the Problems

Based on the limitations above, the researcher formulated a question in which: what are the challenges related to Critical Thinking in Critical Writing at a Private University in Indonesia?

1.5 Objectives of the Study

Based on the formulation above, the objective of this study is to investigate the challenges related to critical thinking in critical writing at a private university in Indonesia.

1.6 Significance of the Study

The researcher is expected to be able to provide significant results of this research for the following:

1. For English Teachers

This study can provide valuable insights into the challenges that students face in connecting critical thinking to critical writing, especially in academic contexts. By identifying the specific difficulties that students face, English teachers can develop more targeted teaching strategies to foster creativity in critical thinking. Teachers can also design more reflective and analytical writing assignments, create questioning techniques and classroom discussions that connect thinking and writing. Furthermore, this study encourages educators to integrate framing methods that help students organize their thoughts, evaluate sources, and articulate arguments more coherently in writing. As a result, the quality of students' writing and the development of higher-order thinking skills can be significantly improved.

2. For Students

This study can motivate students to recognize the importance of critical thinking as a basic skill in academic writing. Through awareness of their cognitive challenges and patterns, students can choose more effective

strategies to plan, organize, and revise their assignments. This study also provides a framework for students to understand how critical analysis, logical reasoning, and reflective thinking enhance their ability to develop well-written arguments. Ultimately, this study facilitates students to become more confident and independent writers who can engage critically with relevant topics.

3. For further researchers

This study contributes to the existing body of knowledge by highlighting the specific relationships and gaps between critical thinking and critical writing in the context of Indonesian higher education. This study offers a foundation for further research on pedagogical practices. Future researchers can use this study as a reference to know challenges related to critical thinking in writing. Furthermore, this study opens up avenues for interdisciplinary exploration between cognitive psychology, applied linguistics, and education.

CHAPTER II

LITERATURE REVIEW

2.1 Critical Thinking

Critical thinking is the essence of writing. Connecting critical thinking in the writing process can have a positive impact on the results of the writing. Siti soraya The basic goal of education is to cultivate students' independent thinking skills to distinguish between right and wrong, which is the essence of critical thinking. According to Paul & Elder (2020), Critical thinking is an active and skilled process that involves conceptualizing, applying, analyzing, synthesizing, and evaluating information obtained or produced through experience, observation, reflection, reasoning, or communication, as a basis for action. Critical thinking skills are very important because they can foster students' attitudes and perceptions, enabling them to acquire and assimilate knowledge, increase their understanding, and develop beneficial thinking behaviors (Anwar & Setyaningrum, 2021). Critical thinking skills are not just about arranging words and sentences, but also mean filtering information, managing the logical structure of arguments, and taking positions that can be academically justified. In addition, Chauhan (2022) claimed that critical thinking means not accepting or taking everything at face value, but questioning and evaluating the source from a critical perspective. Likewise, effective writing requires critical thinking skills throughout the process of creating texts. Therefore, critical thinking will allow writers to present ideas rationally, deeply, and uniquely as the main goal of critical thinking in writing.

In addition to expressing well-supported ideas, critical thinking in writing aims to promote intellectual engagement and greater academic independence. Critical thinking skills can be integrated into the writing process. Using critical thinking skills can make a writer a better writer (Rahmat, 2020). Students who write critically are better equipped to evaluate multiple sources, structure arguments logically, and reach reasoned conclusions about claims. Students who lack critical thinking skills may be unable to engage in reasoning and argumentation in writing, which involves understanding claims or perspectives presented in the literature and synthesizing claims from multiple sources (Teng & Yue, 2023). According to Aziz et al. (2024), metacognitive strategies significantly improve critical thinking skills and create a productive learning environment for English language learners. Learners who develop metacognitive skills, such as monitoring their thinking processes, evaluating their progress, and making decisions about their mental efforts, can become effective critical thinkers when writing. Besides, critical writing skills help students learn throughout their lives and improve their employability, especially as writing is increasingly used as a platform to showcase analytical skills. Critical thinking improves the clarity of writing, strengthens the structure of arguments, and encourages reflective judgment, which are fundamental to academic and professional communication (Ramasamy & Mei, 2025). Moreover, the advantages of this process are not limited to improving writing skills but also help students become more skilled in their metacognitive domain, increase their confidence in debating, and prepare themselves to engage fully in a knowledge-based society.

As discussed above, it can be concluded that critical thinking in writing helps students develop their capacity to critically assess information, formulate logical arguments, and express ideas responsibly and clearly. This encourages independent thinking and lifelong learning hence improving their academic writing skills. However, students should also be encouraged to write with reflective judgment and be open to other points of view. Thus, writing that incorporates critical thinking can significantly support the professional and academic growth of students.

2.1.1 Critical Thinking in the Writing Process

Critical thinking in the writing process requires writers to be aware of their assumptions, question the evidence used, and be open to different perspectives. Critical thinking is a writing process that focuses not only on conveying ideas but also on testing, analyzing, and evaluating ideas in depth (Barnet et al, 2019, p. 177). Writing is important to reflect one's critical thinking, and, at the same time, good writing requires critical thinking and its aspects. Writers must not only be able to construct sentences that support their opinions, but they must also have the ability to see the other side of an argument, find logical weaknesses, and create a coherent and convincing writing structure (Imaniar et al., 2024). Writers also need to develop critical thinking skills to analyze arguments more thoroughly and avoid bias in their writing. These skills not only strengthen their position but also help build trust and credibility with their readers. In addition, Latif (2021) observed that different parts of the writing process, like ideational planning, searching for content, and revising, work together. He also stated that both beginner and experienced writers use all of these parts but in different ways and to different extents. Therefore, writing is a

dialogic activity that is not only an expression but also includes the interaction between individual ideas in a broader academic context. This process increases a deeper understanding of a topic being discussed and produces writing that is not only communicative but also reasonable and responsible.

Critical thinking in writing is an iterative process. This skill must be developed in all contexts, especially in educational contexts. Facione & Gittens (2016, p. 29) emphasize that interpretation, analysis, evaluation, inference, explanation, and self-regulation are the six main components of critical thinking related to writing. The writer must be able to understand and interpret the problem to be discussed (interpretation), then analyze the important elements of the argument presented. The evaluation stage is carried out by considering the quality of evidence or assumptions, then making logical conclusions. Furthermore, the argument must be explained and reviewed systematically to ensure that the argument is consistent and in accordance with academic standards.

2.2 Critical Thinking Challenges

Critical thinking is a vital skill in today's complex, conflicting world, yet not so many people have the ability to structure and evaluate arguments logically and responsibly, as it is the key to critical thinking. According to Chaffee (2010, p. 397), critical thinking challenges relate to the construction of an argument that embeds the critical planning, processing, and production. Argument is more than just a dispute or debate, it involves a systematic effort to present reasons that support a conclusion. To make wise decisions, solve problems, and talk to others healthily hence it is important to understand the quality and structure of arguments. In

addition, this ability is also increasingly important in the writing process that derive the information from written and digital sources, where information spreads quickly but does not always have strong logic or accuracy. However, many individuals are still figuring out how to employ their Critical thinking to sort out information, find false arguments, and avoid manipulated opinions (Amani & Mkimbili, 2025). Accordingly, a number of individuals are unable to contribute to more rational and constructive discussions by making clear arguments and evaluating their truth thoroughly. This is what makes critical thinking not only an intellectual ability but also an important mental attitude to construct clear, credible, and effective arguments. In detail, Chaffee (2010, p. 418) revealed several core thinking processes that become challenges in Critical Thinking. These are important and mostly found in the field of education, especially in developing critical engagement and intellectual growth of students, as follows:

1) Recognizing Arguments

Recognizing Arguments refers to an argument for reasoning purposes that consists of one or more. To recognize an argument, the writer must be able to distinguish the parts of a text or speech called Cue Words. In most cases, words such as "because", "therefore", "hence", or "because of" are used to mark arguments (Chaffee, 2010). However, not all arguments have clear clues, so it is important to distinguish between supporting statements and conclusions, which is called Contextual Meaning. Because hidden arguments are common in everyday communication, this ability is essential for critical thinking. By properly

understanding arguments in the form of Cue Words or Contextual Meaning, one can avoid logical fallacies and better understand the speaker's intent.

2) Evaluating Arguments

Evaluating arguments is the process of analyzing whether an argument is logical, reasonable, and convincing. Likewise, Chaffee (2010) identified three main criteria for evaluating arguments: Truth, Validity, and Soundness. First, Truth means one must assess whether an argument is valid or not. In this matter, the premises used in the argument are factually true and can be proven with evidence or data. Second, Validity means an argument is constructed based on a coherent and defensible chain of reasoning that justifies a valid interpretation and conclusion. One can determine whether the reasons are reasonable. Third, Soundness relates to the sound of an argument that is considered the strongest and most reliable form of reasoning derived from Truth and Validity. This evaluation is important for determining confidence in an argument that is not yet clear, but the argument is based on reasonable assumptions. In addition, understanding this evaluation allows one to be a more selective student and learner, as well as a more attentive student.

3) Understanding deductive arguments

Understanding deductive arguments relates to grasping the concept of a deductive argument; if all the premises are true, then the conclusion must be true. Chaffee (2010) highlighted several common types of deductive logic, including Application of General Rule (AGR) relates to build Argument 1, modus ponens ("if A then B; A is true, then B is true) or Argument 2, modus tollens ("if A then B; B is false, then A is false) or Argument 3, and disjunctive syllogism ("if A then B; A

is false, then B is true) or Premise. Formal logic relies on these types because they can help us construct structurally correct arguments. In a scientific or logical process, deduction is used because it provides logical certainty. Understanding deductive types also helps one identify illogical arguments, such as when the conclusion does not consistently follow from its premises.

4) Constructing Extended Arguments

Constructing a thinking process focuses on establishing a structured thinking process that is required to create a long and complex argument. The first step required is to determine a position or thesis, which is called determine a Premise. The reader must then conduct research, collect data, and evaluate the quality and credibility of the sources of information. Next, ideas are organized into supporting arguments 1 through 3, in which Conducting Research (CR) and Evaluating Sources (ES), which logically lead to the main conclusion. To write an extended argument, it is important to consider the opposing viewpoint and critically and fairly respond to it. Chaffee (2010) emphasized that writing an argument is not just about convincing others, but also about helping them think in a clear and logical way. During this process, one is trained to think reflectively, analytically, and communicatively so that they can convey ideas in a convincing and responsible manner.

In conclusion, Recognizing arguments, Evaluating Arguments, Understanding Deductive Arguments, and Constructing Extended Arguments are important in constructing critical thinking to be credible, valid, and effective, yet these are challenging to be done by many individuals. Therefore, the four core thinking

processes that become challenges in critical thinking revealed by Chaffee (2010) will be further employed in this prior study to investigate these in students' critical writing at a private university in Indonesia.

2.3 Critical Writing at the University Level

Critical writing is an essential skill in college that requires students to not only understand and present concepts but also analyze, evaluate, and construct arguments based on relevant evidence. Critical writing involves the ability to question information, uncover hidden beliefs, assess the credibility of sources, and draw academically sound conclusions. Through a systematic, coherent, and reflective writing structure across multiple perspectives, students are expected to not only convey facts but also demonstrate the ability to think critically (Saha, 2022). In higher education, critical writing should be different from descriptive writing. Descriptive writing simply conveys information or describes events without examining them in depth, while critical writing encourages students to sift through information, challenge their existing beliefs, and construct deeper, more complex intellectual narratives. In addition, Ibrahim (2022) claimed that the use of critical writing in higher education also has a positive effect on improving higher-order thinking skills. In other words, critical writing can help students refine their critical thinking and analytical skills when confronting academic and professional challenges.

However, an overly structural and formulaic educational approach often hinders the development of critical writing at the university level. According to Moon (2007), the tendency of higher education to assume that in writing students

will automatically produce critical thinking without any specified teaching writing strategy or technique is a major problem. However, writing becomes a mechanical activity that only replicates information if there is no clear instruction and space for thinking. In addition, a curriculum that focuses too much on quantitative assessment prevents students from taking intellectual responsibility for their writing. This results in poor quality argumentation and shallow analysis in academic assignments.

In a higher education context, students are expected not only to write technically correct but also to be able to construct reflective and analytical arguments. However, many internal and external obstacles hinder this ability. Students' lack of metacognitive awareness of their thinking processes often causes them to have difficulty developing critical thinking. Many of them write without understanding how to evaluate evidence, find hidden beliefs, or make contradictory arguments. The lack of contextual and ongoing critical thinking training exacerbates this problem (Budden, 2007). In addition, exploring more critical ideas is often hampered by the demand to follow a "safe" writing structure and meet the lecturer's expectations. Therefore, critical thinking the students face difficulties in writing not only because of students' critical thinking skill ability but also because of the academic culture and system that influence the way they think.

2.4 Critical Writing Challenges

In writing, there are two main challenges that are faced by students. Linguistic challenges such as grammar and vocabulary accuracy are closely intertwined with discourse challenges such as coherence and cohesion (Bitchener et al, 2020).

Accordingly, the challenges of writing proposed by Hyland (2021) then specified into challenges of critical writing in which discovered and written by several perspectives, as follows:

1. Linguistic Challenges

Linguistic challenges include problems related to language. In this case, linguistic challenges refer to writers who are unable to recognize and follow the rules of grammar, academic or formal vocabulary, and mechanics of writing (Hyland, 2021). Limited mastery of linguistic aspects of writing, such as academic vocabulary and grammar rules, is a major problem, making it difficult for students to make a well-written, clear, and effective writing script. Often, they have to rely on dictionaries or translate words into their mother tongue, the latter being time-consuming and ineffective. Students struggle to meet academic standards in writing because they are not familiar with writing styles and proper citation rules. Students have difficulty in critical writing to convey ideas clearly and confidently (Aizawa et al., 2023). However, the problem related to linguistic challenge in critical writing often hinders students' language-related skill due to the use of specific vocabulary, writing structure, and writing styles.

2. Discourse Challenges

Discourse challenges include problems in term of overall flow, unity, and clarity of a writing. In writing, discourse challenges related to a problem faced by writers in the matter of their competence or ability to construct coherent text and capability of developing cohesive writing text (Hyland, 2021). Besides, discourse challenges primarily relate to students' difficulties in understanding and applying academic

discourse conventions appropriate to the demands of a specific topic. He (2008) stated that students often struggle to organize ideas and connect arguments consistently into a coherent critical writing text. In addition, they struggle to adapt the language style and structure of their writing to academic expectations, especially when they are required to write a text in that needs to be critical and argumentative. The inability to understand the common argumentative structures in critical writing, including how to develop a thesis, support it with relevant evidence, and organize the parts of a piece of writing logically, compounds these problems. In addition, students often have difficulty finding and responding to different perspectives, which causes their writing to be monotonous and uncritical. These discourse challenges suggest that students must understand the social and cultural dynamics of academic discourse if they are to write critically and effectively.

2.5 Review of Relevant Study

In this study, the researcher found several previous studies that are relevant to this study:

The first study untitled "*A Study on the Difficulties in Writing Argumentative Essays of English-Majored Sophomores at Tay Do University*" by Dang et al. (2020) aims to explore the challenges encountered by English-majored sophomores in writing argumentative essays and to provide insights that can help improve their writing skills. The research employed a mixed-method approach combining questionnaires and interviews involving 90 students and two teachers. Combining descriptive statistics from the questionnaire with thematic analysis of interview responses for the analysis. The findings highlight several key issues: (1) linguistic

difficulties, particularly limited vocabulary, grammatical errors, and problems achieving coherence, which significantly hinder students' ability to express ideas effectively; (2) insufficient background knowledge, which leads to weak arguments and over-reliance on the mother's tongue that affects grammar and word order; (3) organizational challenges, where students struggle to create outlines, formulate strong thesis statements, provide supporting evidence, and write counterarguments; and (4) low critical thinking skills, which results in unconvincing and shallow arguments. The study emphasizes the need for more focused teaching strategies that integrate critical thinking and writing instruction, helping students construct well-supported and logically organized argumentative essays.

The second study conducted by Bulqiyah et al. (2021) entitled "*Investigating Writing Difficulties in Argumentative Writing: Tertiary Students' Perspectives*". This study aimed to explore the challenges faced by tertiary EFL students in Argumentative writing, focusing on affective, cognitive, and linguistic difficulties as perceived by the students themselves. The study used an explanatory sequential mixed methods design, combining a web-based questionnaire and semi-structured interviews with descriptive statistics followed by thematic analysis. The findings revealed that students struggled with low self-confidence, anxiety, and a lack of motivation, which negatively impacted their writing performance. Cognitive difficulties included generating ideas, transferring thoughts from their first language to English, and following writing processes such as planning, drafting, and revising. Linguistic challenges centered on limitations in grammar, vocabulary, and coherence in essay structure. This study emphasizes that both teachers and

students should pay serious attention to these areas, with implications for improving writing course materials and teaching strategies in EFL contexts.

The third research entitled "*Cultural Capital and Argumentative Writing in English: Challenges and Strategies Used by EFL Student Teachers*" by Fajaryani et al. (2021) aimed to explore the challenges experienced by EFL students in composing argumentative essays in English and the strategies they used to overcome those challenges. The study employed a qualitative case study design, with semi-structured in-depth interviews as the primary method of data collection, involving twelve students from a teacher training program in Jambi, Indonesia. Thematic analysis was applied to identify key themes and patterns from the participants' experiences. The findings reveal that students struggle with insufficient vocabulary and grammar, difficulty in constructing arguments, limited critical thinking skills, and unfamiliarity with certain topics. In addition, cultural factors such as parental support, peer relationships, and passive classroom habits influence their writing development. To manage these challenges, students employed cognitive strategies such as brainstorming and outlining, metacognitive strategies such as self-editing and revising, and social strategies through discussions with friends. This study provides insights into how cultural capital shapes students' writing experiences and highlights the need for writing instruction that integrates critical thinking and collaborative learning practices.

The fourth study conducted by Khairuddin et al. (2022) entitled "*Exploring Critical Thinking in Writing*". This study aimed to investigate how undergraduate students applied critical thinking skills during the academic writing process,

focusing on how they applied, analyzed, synthesized, and evaluated information also investigating the challenges. The study employed qualitative design, using open-ended responses from 20 undergraduate students who had attended a research writing course as its main data collection method. Thematic analysis was applied to identify key themes and patterns in the students' experiences. The findings revealed that students faced challenges in all stages of critical thinking, including difficulty finding relevant and research-based articles, analyzing and categorizing large volumes of information, synthesizing ideas into coherent arguments, and evaluating the relationships between ideas and past studies. To overcome these challenges, students developed strategies including refining search keywords, creating tables to organize ideas, engaging in critical reading, and making comparisons across sources. This study provides insights into the integral role of critical thinking in academic writing and emphasizes the importance of supporting students in developing both cognitive and metacognitive strategies.

The fifth study conducted by Ananda et al. (2024) entitled "*Writing Argumentative Essays: Challenges and Strategies of EFL Students in Jambi*". This study aims to assess the challenges faced by EFL students at the University of Jambi in writing argumentative essays and the strategies they use to overcome these challenges. This qualitative case study used semi-structured interviews and document analysis to collect data from fifth-semester students in an English education program. Thematic analysis was applied to identify key themes and patterns in the students' experiences. The findings revealed that students faced difficulties in constructing arguments, organizing their ideas coherently,

formulating a clear thesis statement, and understanding the concepts of counterclaims and rebuttals. In addition, students struggled to integrate supporting evidence and apply appropriate citation techniques. To overcome these challenges, they used strategies such as reading multiple sources, watching instructional videos, using AI tools such as ChatGPT and Grammarly, conducting independent revisions, and seeking feedback from peers and lecturers. The study concluded that more intensive and varied pedagogical support is needed to help students develop critical thinking and academic writing skills in the EFL context.

Therefore, there are several similarities and differences among this recent study and previous studies. In the matter of the similarities, first, this recent study and the previous studies both focus in students at university level. Second, this recent study and the previous studies have in common in terms of research method employed; qualitative study yet some of the study applied mixed method that also include qualitative research by Dang et al. (2020) and Bulqiyah et al. (2021). Lastly, both this recent study and previous studies center on the difficulties in argumentative writing as it is the same genre or term as critical writing. On the other hand, there are differences between this recent study and previous studies in terms of aspect of writing difficulties. Most of studies investigate the difficulties of writing regarding to the writing strategies while this recent study specified the writing challenges concerning critical thinking-related challenges. Although, a previous study by Khairuddin et al. (2022) reviewed challenges in writing related to Critical Thinking, nevertheless the aspects of critical thinking-related challenges are differ from this recent study in which apply critical thinking challenges

framework by Chaffee (2010). Therefore, this study focusing on the exploration of critical thinking challenges and critical writing skills in students at private university in Indonesia. Thus, this study makes a theoretical and practical contribution to the importance of four aspects of critical thinking, such as Recognizing Arguments, Evaluating Arguments, Understanding Deductive Arguments, and Constructing Extended Arguments.

2.6 Theoretical Framework

The theoretical framework of this research is visualized and elaborated as follows:

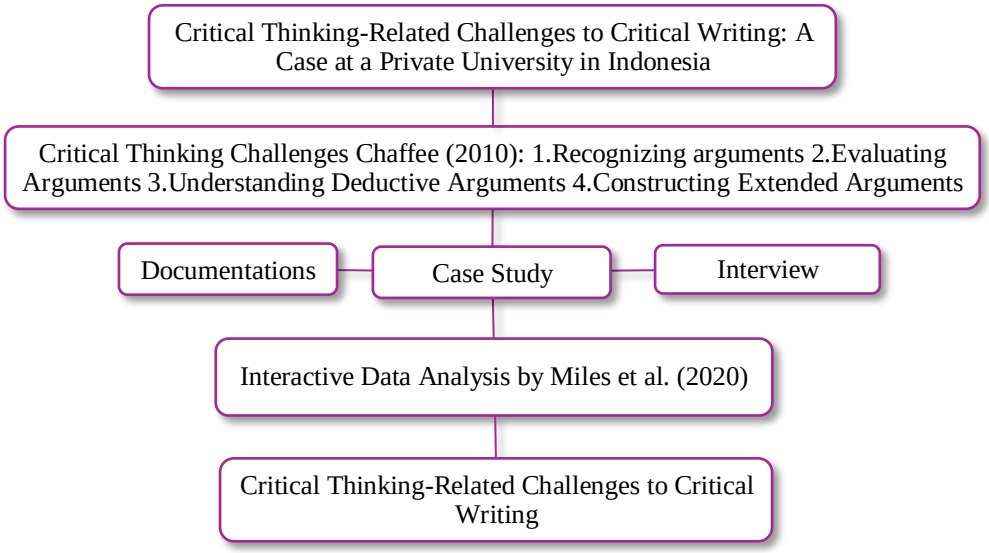


Figure 2.1 Theoretical Framework of the Study Focus on critical thinking challenges in critical writing

This study is illustrated by the theoretical framework above. This recent study entitled "*Critical Thinking-Related Challenges to Critical Writing: A Case at a Private University in Indonesia"*. Then, this study will investigate students' challenges related to Critical Thinking in Critical Writing by following a theory

proposed by Chaffee (2010); Recognizing arguments, Evaluating Arguments, Understanding Deductive Arguments, and Constructing Extended. Yin (2017) his study uses a case study approach, which combines document analysis and interviews as the primary methods of data collection. Documentation helps to investigate the data needed, while interviews are used to gain in-depth insights into students' challenges of critical thinking in critical writing. Data analysis followed the interactive model by Miles et al. (2020), which involved an iterative process of data condensation, data display, and conclusion drawing to ensure validity and reliability. Therefore, the findings of this study will reveal students' challenges related to Critical Thinking in Critical Writing.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Design

In this study, a qualitative research method with a case study design will be employed since the aim of this prior study is to investigate critical-thinking challenges related to critical writing at a private university in Indonesia. The research method is a qualitative case study design, which aims to explore and investigate the challenges of students' critical thinking in critical writing. A case study is a qualitative approach used to understand a specific phenomenon in depth within a specific context. Yin (2017, p. 45) emphasized that a case study is an empirical inquiry that investigates a contemporary case in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be evident. This method was chosen because it includes a rich and detailed exploration of the students' experiences and perspectives related to a case within a real-world context. Furthermore, the case study design allows the researcher to investigate a case, critical thinking-related challenges, deeply within a specific context, in this context, Critical Writing at a Private University in Indonesia.

3.2 Setting and Participants

This research will be conducted at a private university in Indonesia, specifically within the English Language Education Study Program. This program includes a Critical Writing course in the curriculum to help students enhance their academic and critical thinking skills through writing activities. During initial observations, the researcher noticed students faced significant challenges in developing critical

thinking in classroom writing practices. This situation makes the location highly relevant and offers potential for further exploring the challenges students face and the factors that influence their ability to write critically.

The participants in this study included five undergraduate students from the 4th semester at a private university in Indonesia. Participants are selected through purposive sampling because they met specific criteria relevant to the study's focus, particularly their involvement in critical writing activities and their relatively strong writing skills in each classroom setting. The strength of purposive sampling lies in choosing information-rich cases for in-depth analysis. These cases provide a wealth of knowledge about issues central to the investigation's purpose (Munhall, 2008, p. 697). The participants consisted of three females and two males, all of whom had completed the Critical Writing course in the English education program.

3.3 Data Collection Techniques

The data collection in this study will use Documentation and Interviews, which will be explained in detail as follows:

3.3.1 Documentation

Documentation is a data collection technique that involves gathering written materials or artifacts related to the research focus. In this study, documentation refers to students' writing exercises from the Critical Writing course. Documentation aims to identify indicators of critical thinking, such as Recognizing Arguments, Evaluating Arguments, Understanding Deductive Arguments, and Constructing Extended Arguments (Chaffee, 2010, p. 415). According to Creswell & Creswell (2023), documentation is useful because it provides stable, unobtrusive,

and accurate text-based data. These documents are used to analyze students' actual writing performance in applying critical thinking in their critical writing. The researcher selected essays written as part of students' coursework to serve as documentation for this study. In this study, documentation is understood as a data collection method that uses students' written essays from the Critical Writing course, chosen because they effectively demonstrate critical thinking skills. The analysis was conducted using Chaffee (2010) indicators, which enable researchers to examine the extent to which students Recognize Arguments, Evaluate Arguments, Understand Deductive Arguments, and Construct Extended Arguments more comprehensively. Consistent with Creswell (2023), this documentation provides stable, accurate, and authentic data regarding students' application of critical thinking skills in academic writing practice.

3.3.2 Interview

An interview is a data collection method involving direct interaction between researchers and participants to gather detailed information relevant to the research focus. In this study, interview is conducted to explore students' challenges regarding integrating critical thinking into critical writing. As a qualitative method, interview allow participants to openly share their views and perspectives through flexible, open-ended questions (Creswell, 2023). This study will use semi-structured interviews because they align with the exploratory nature of this research, which aims to explore the challenges of critical thinking in critical writing. The semi-structured interview is formal and conducted according to an interview guide, but still allows flexibility (Taherdoost, 2021). The researcher developed 26

interview questions addressing students' challenges related to critical thinking in critical writing and focused on the four components of critical thinking in writing as identified by Chaffee (2010). Interviews will be conducted individually with five selected participants. To collect the data, the researcher followed the interview procedures proposed by (Taherdoost, 2021). The procedures of interview are as follows:

1. The researcher ensures a good appearance to foster a sense of comfort for the students.
2. The researcher introduces herself and the institution to the students.
3. The researcher explains the objectives of the study and interviews students based on the subject research.
4. The researcher will collect the data from each student and record all answers as part of the data documentation.
5. The researcher closes the session by expressing gratitude for their participation.

3.4 Data Analysis Techniques

This study employs qualitative data analysis. Qualitative data analysis is a core component of educational research, aiming to explore the depth and complexity of participants' experiences and interpret how these experiences shape the meaning of events, practices, or challenges they face. In this study, documents from five students' essays and interview results will be analyzed through an interactive approach to understand recurring difficulties in applying critical thinking. Document analysis supported the identification of individual and common patterns

across writing assignments. The analysis in this study will adopt the interactive model, which consists of three main components: data condensation, data display, and drawing conclusions (Miles et al, 2020, p. 31). The components are as follows:

3.4.1 Data Condensation

Data condensation is the process of selecting, focusing, simplifying, abstracting, and transforming data from documents and interview transcripts. This process occurs throughout the research process. The researcher filtered and simplified data from student essays and interview transcripts to focus and direct them. From the essay documents, sections containing arguments, evidence, and deductive reasoning were sorted and condensed into data units that corresponded to critical thinking indicators. Meanwhile, interview results were summarized from long statements into concise data that highlight students' challenges in writing essays.

3.4.2 Data Display

Data display is a type of data analysis in qualitative research, where collected data is organized and summarized. This data can be displayed in tables, diagrams, graphs, or concept maps to demonstrate the relationships between the findings from the documentation and interviews. The purpose of the data display is to help researchers see what is happening more clearly in a visually appealing format. The researcher can see patterns and the correspondence between written and spoken data more clearly and comprehensively.

3.4.3 Drawing Conclusions

The final phase is drawing conclusions, where researchers interpret the data to discover patterns, draw inferences, and develop an understanding of students' critical thinking skills in critical writing. Initial conclusions emerging from data collection are continually verified through cross-confirmation, triangulation of data sources, searching for negative evidence, and direct validation with participants. Drawing conclusions in qualitative data analysis is used to assess and consider the meaning of data results, and then draw conclusions to summarize data in statements and verify conclusions to review data results.

Based on the description above, the components of qualitative data analysis using an interactive model can be visualized as follows:

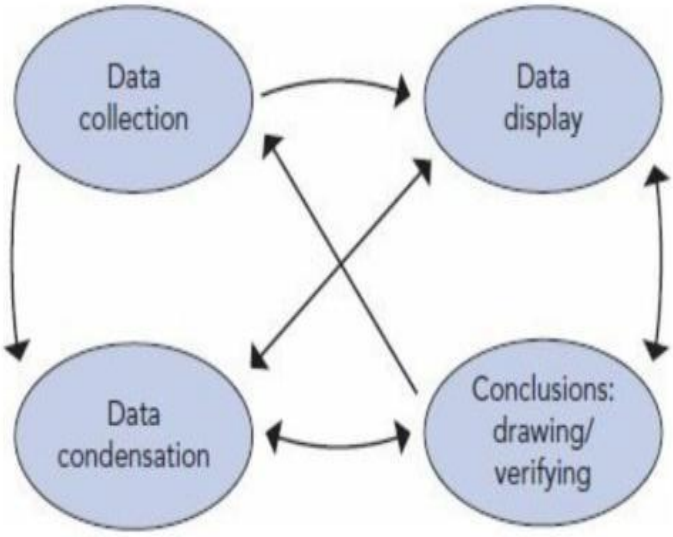


Figure 3.1 Model of Data Analysis by Miles et al. (2020)

3.4 Trustworthiness

To ensure credibility in this qualitative research, the researcher employs data triangulation as the primary validation strategy by combining data from documentation in the form of student essays and interviews with the same students. In line with Yin (2017, p. 154), the use of multiple sources of evidence can strengthen construct validity and internal validity by establishing a convergent line of inquiry. In the context of this research, data triangulation allows the researcher to compare students' actual performance in writing with their reflections through interviews, thereby ensuring data consistency and minimizing potential bias. Triangulation helps verify findings across data sources, thereby enhancing the clarity and credibility of the analysis (Miles et al., 2020). Thus, the application of data triangulation between documentation and interviews not only strengthens credibility but also ensures the confirmability of the research findings, ensuring that the analysis remains methodologically and academically rigorous.

3.5.1 Credibility

The credibility of this study refers to the believable and truthful findings from the perspective of the participants. According to Creswell (2023, p. 242), this can be established through techniques like triangulation and member checking, where data are validated by participants to ensure accurate interpretation. In this study, credibility was achieved by comparing responses from interviews with the students' written texts, allowing the researcher to see consistency in what they say and what they write. Miles et al. (2020) further suggest using rich descriptions and actively considering rival explanations as part of internal validity procedures. These steps

ensure that the conclusions truly reflect what participants experienced, not merely the assumptions of the researcher.

3.5.2 Confirmability

Confirmability in this study refers to the extent to which findings are based on data provided by participants and are not influenced by the researcher's biases or perspectives. Creswell (2023) emphasized that confirmability can be strengthened through the use of an audit trail that transparently documents the analysis process. In this study, confirmability was maintained through maintaining detailed coding records, allowing a clear path from the raw data, student essays, and interview transcripts to the final categories and findings. Miles et al. (2020) emphasize linking findings directly with visual data displays and keeping a trackable sequence of data processing steps as essential to this principle. These strategies help ensure that interpretations are reviewed and verified by other researchers, ensuring objectivity and methodological rigor.

CHAPTER IV
RESEARCH FINDING AND DISCUSSION

4.1 Research Finding

This study applied documentation and semi-structured interviews as the primary research instruments. These instruments were used to investigate students' challenges with critical thinking in writing. The results obtained from the documentation and semi-structured interviews revealed several emerging themes. In the aspect of recognizing arguments, the theme that emerged was challenges in recognizing contextual meaning, which indicates students' challenges in interpreting and distinguishing the intended meaning behind statements. In the aspect of evaluating arguments, the prominent themes were challenges in evaluating valid and soundness arguments, which highlights students' difficulties in distinguishing between logical structure and the truth value of premises. Furthermore, in the aspect of understanding deductive arguments, the theme that emerged was challenges in disjunctive syllogism, which indicates challenges in applying this form of reasoning appropriately. Finally, in the aspect of constructing extended arguments, the identified theme was challenges in identifying a thesis. This study further identified nine subthemes. These subthemes provide more nuanced insights into the specific obstacles students face in critical writing. Thus, the results of documentation and semi-structured interviews are discussed further below:

4.1.1 Challenges in Recognizing Contextual Meaning

Contextual meaning is a crucial aspect of critical writing because it requires students to understand not only the literal meaning of a word but also the meanings that emerge from the context in which it is used. In critical writing, meaning is often implied rather than stated directly, making the ability to interpret context crucial for producing accurate arguments. Documentation and semi-structured interviews revealed that students often face challenges in recognizing implied meanings and adapting word meanings to suit different contexts. This problem makes their writing less coherent and often ambiguous. For example, when students only understand superficial meanings, it's what something looks like on the outside, but not necessarily what it *really* means. They fail to connect ideas logically, resulting in weak arguments. The use of cue words such as however, therefore, because, or although also becomes problematic when their meanings do not align with the context of the sentence. As a result, arguments can appear contradictory or irrelevant. Challenges with contextual meaning also affect the analytical depth of students' writing. Without the ability to understand implied ideas and adapt words to the situation, students tend to produce descriptive rather than critical writing as explained further below:

a. Inability to Implied Meaning

   From the student documentation, it was found that some arguments written by students exhibited literal interpretation without considering implied meaning. For example, one student concluded that an author agreed with an argument when, in fact, the author provided an indirect counterargument.

This indicates that students were unable to grasp the implied meaning contained in the text. Another case found in the documentation was students copying statements directly from the source without analyzing what the author actually implied. This indicates that students often miss the depth of the argument written. From the results of students' documentation, it can be shown below:

Table 4.1.1 Inability to Implied Meaning

Students' essay	CM	Preliminary Code
The development of generative AI technology, particularly ChatGPT, has had a significant impact on how students develop critical thinking skills in higher education. On the one hand, AI helps simplify complex concepts and increases learning engagement. However, on the other hand, excessive reliance on AI has the potential to undermine students' intellectual autonomy. In this context, it is important to review traditional learning approaches, such as Bloom's Taxonomy, to be more responsive to the cognitive and affective needs of AI-assisted learning environments. A study by Gonsalves (2024) shows that the use of AI affects not only the cognitive domain but also the affective domain, such as emotional engagement and collaboration, which are crucial for the quality of students' critical thinking.	*"On the one hand, AI helps simplify complex concepts and increases learning engagement.* ***However,*** *on the other hand, excessive reliance pn AI has the potential to undermine students' intellectual autonomy." (D-S1-IIM)*	Inability to Implied Meaning
Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the ways in which students learn and engage with material. These technologies offer significant advantages such as personalized support, increased	"*These technologies offer significant advantages such as personalized support, increased engagement, and enhanced creativity.* ***However,***	Inability to Implied Meaning

engagement, and enhanced creativity. However, concerns have also emerged, particularly about their impact on cognitive processes like critical thinking and memory, as well as on affective elements such as motivation and emotional development. This complexity suggests that while AI has the potential to be a beneficial tool in education, its influence on both cognitive and affective domains must be critically examined.	*concerns have also emerged, particularly about their impact on cognitive processes like critical thinking and memory, as well as on affective elements such as motivation and emotional development*." (D-S5-UDC)	

From the table above, this sentences indicates that students emphasize the challenge of interpreting meanings that are not explicitly stated, reflecting their challenge in understanding the contextual meaning contained in arguments. Students do not provide complete arguments related to these contextual meanings. They tend to state contradictory ideas superficially without elaborating on the underlying reasons, evidence, or logical connections that could support these claims. The cue word "however" in the sentence should be understood as a marker of contrast or conflict between two opposing ideas, namely the benefits and risks of using AI in learning. However, the documentation results show that students do not grasp the relationship between these opposing meanings and understand the sentence literally. This indicates that students are unable to interpret the contextual meaning and implicit relationships between clauses, thus failing to understand the hidden message that the author is actually highlighting, which encompasses both the positive and negative aspects of AI use. Thus, this inability falls into the category of inability to implied meaning, because

students cannot recognize meaning that is not explicitly stated through the discourse marker "however." As a result, the arguments are incomplete and lack coherence, making the overall reasoning invalid in terms of argumentative quality. This issue was also further emphasized in the student's semi-structure interview:

"*The challenge is that* ***it can be hard to catch the implied meaning of a text, especially if the language is academic or figurative."*** *(I-S1-IIM)*

"I ***often struggle to identify the correct sense of a word in academic texts****." (I-S5-UDC)*

From the result of semi-structure interview above, it is shown that students are aware of their weaknesses in understanding implied meaning but still struggle to overcome them. These challenges impact the quality of critical writing because the inability to grasp implied meaning leads to weak arguments and shallow analysis.

From the results of students' documentation and interviews, the researchers concluded that the inability to understand meaning is one of the most significant obstacles to students' critical writing. Students tend to take texts literally, thus failing to grasp deeper layers of meaning. This condition often results in their writing being shallow and lacking in argumentativeness. They struggle to construct convincing arguments because they do not read the text critically and thoroughly. In this context, semantic inference skills need to be emphasized more in critical writing lessons. Students should be accustomed to viewing texts not only from the

meaning of each word, but also from the meaning hidden behind the sentence structure (Ibrahim, 2022). With this habit, their writing will be richer in analysis and less trapped in superficial meanings. The researchers also assessed that practicing reading academic texts with a focus on implied meaning is crucial. This not only improves critical reading skills but also strengthens argumentation in writing.

4.1.2 Challenges in Evaluating Valid Arguments

In critical writing, validity plays a central role in determining the strength of an argument. An argument is considered valid if the reasons presented truly support the conclusion it draws. Students are expected to understand that validity involves more than simply constructing logical sentences; it also involves ensuring the existence of premises. However, in practice, many students do not fully grasp this concept. They tend to simply write personal opinions without checking whether those opinions are supported by logical and relevant premises. This error causes arguments to appear sound on the surface, but they are academically weak. Furthermore, students often confuse validity with factual truth, if an argument supported by facts is automatically valid. However, validity requires the existence of data. This misunderstanding ultimately results in poor-quality critical writing, as the arguments constructed cannot be logically justified. Therefore, a thorough understanding of validity and its application is crucial for students in critical writing, as explained further below:

- Inability to Use Premise

The aspect of Inability to Use Premises (IUP) presents a significant obstacle in students' critical thinking process, as evidenced by interview data. As many as 4 students faced challenges in testing the validity of the premises they employed, often struggling to align these premises factually with their arguments, as found on S3 and S5 documentation:

Table 4.1.2 Inability to Use Premise

Students' essay	**V**	**Preliminary Code**
In the era of globalization, the development of artificial intelligence (AI) has had a significant impact on the field of education, including the emergence of generative AI. Generative AI refers to a technology capable of producing text, images, or audio based on previously learned data. In the context of learning, generative AI is increasingly being utilized to create more interactive and personalized teaching and learning experiences. One of the most notable impacts of this technology can be observed in the cognitive and affective domains of students. Many students report greater engagement when learning with responsive and innovative AI tools. However, the implementation of generative AI requires supervision and guidance from educators to prevent potential misuse by students.	"*Many students report greater engagement when learning with responsive and innovative AI tools.*" (D-S3-IUP)	Inability to Use Premise
Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the ways in which students learn and engage with material. These technologies offer significant advantages such as personalized support, increased engagement, and enhanced creativity. However, concerns have also emerged, particularly about their	*"Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the*	Inability to Use Premise

impact on cognitive processes like critical thinking and memory, as well as on affective elements such as motivation and emotional development. This complexity suggests that while AI has the potential to be a beneficial tool in education, its influence on both cognitive and affective domains must be critically examined.	*ways in which students learn and engage with material.*" (D-S5-IUP)	

From the table above, these sentences illustrate students' inability to use premises, which refers to their difficulty in constructing logical arguments based on supporting statements or evidence. Sentences from S3 and S5 both function as factual or descriptive premises that could be developed into stronger arguments about the impact of AI on learning engagement. However, the documentation results show that students present these premises separately, without connecting them to a clear claim or conclusion. Although they successfully identify observable facts such as increased engagement or widespread use of AI, they fail to utilize these facts as premises to support a broader argumentative stance (e.g., whether this engagement leads to improved learning outcomes or potential dependence on the technology). This reflects a lack of inferential thinking, where students should connect these premises to strong evidence. As a result, the argument remains incomplete and lacks coherence. Therefore, this problem is categorized as an inability to use premises, as students are unable to transform factual information into a structured argument, resulting in weak logical development and limited critical depth in their reasoning.

This challenge is highlighted further by S3 interview, who testified:

"*The challenge is ensuring that arguments are based on reliable evidence." (I-S3-IUP).*

Furthermore, the core issue is often rooted in the ambiguity of the premise itself, leading to confusion, where student S5 remarked:

"Because I feel confused if the premise is not clear." (I-S5-IUP).

This lack of clarity and the inability to critically examine the foundations of their arguments severely impact the robustness of their critical writing. They are often unable to distinguish between an assumption and a foundational fact, weakening their overall chain of reasoning. Consequently, their arguments frequently rest on shaky ground, making them vulnerable to counterarguments (Aizawa et al., 2023). The researcher concluded that the students' challenges in ensuring premises are clear, valid, and unbiased must be addressed to strengthen the logical framework of their analysis.

- Unfamiliarity with Valid Arguments

  Students also demonstrated Unfamiliarity with Valid Arguments, particularly in ensuring their arguments are sound (valid and supported by true evidence). Data shows that while students can sometimes produce arguments with a logically valid structure, these arguments are often invalid due to insufficient or inaccurate evidence. This gap is reflected in Documentation by S3 and S4:

Table 4.1.2 Unfamiliarity with Valid Arguments

Students' Essay	V	Preliminary Code
In the era of globalization, the development of artificial intelligence (AI) has had a significant impact on the field of education, including the emergence of generative AI. Generative AI refers to a technology capable of producing text, images, or audio based on previously learned data. In the context of learning, generative AI is increasingly being utilized to create more interactive and personalized teaching and learning experiences. One of the most notable impacts of this technology can be observed in the cognitive and affective domains of students. Many students report greater engagement when learning with responsive and innovative AI tools. However, the implementation of generative AI requires supervision and guidance from educators to prevent potential misuse by students.	*One of the most notable impacts of this technology can be observed in the cognitive and affective domains of students.* (D-S3-UVA)	Unfamiliarity with Valid Arguments
One significant advancement in educational technology is the impact of generative artificial intelligence (Generative AI) on students' cognitive and affective domains. As a tool capable of producing human-like content and interactions, generative AI affects not only how students absorb and retain information but also their emotional and motivational states. Given that educational institutions are increasingly integrating AI technologies into their learning processes, I believe it is imperative to understand these effects. While the affective domain includes motivation, feelings, and attitudes, the cognitive domain involves mental abilities such as reasoning, memory, and problem-solving.	*As a tool capable of producing human-like content and interactions, generative AI affects not only how students absorb and retain information but also their emotional and motivational states.* (D-S4-UVA)	Unfamiliarity with Valid Arguments

From the table above, sentences from S3 and S4 demonstrate their unfamiliarity with valid arguments, as they present general statements that lack sufficient reasoning, evidence, or logical connections to form a strong argumentative structure. These sentences demonstrate that students can identify relevant topics and express broad claims about the impact of AI in education. However, these claims remain descriptive rather than argumentative, as they do not include premises, examples, or supporting data that validate the relationship between AI use and its cognitive or affective impacts. The lack of explicit causal relationships or evidence suggests that students are unfamiliar with the structural elements of valid arguments, such as premises, evidence, and conclusions. Their statements demonstrate a tendency to rely on general statements without elaborating on why or how these effects occur, leading to arguments that sound plausible but lack logical rigor and empirical support. This suggests that students' reasoning is incomplete and they struggle to construct valid arguments. Therefore, this weakness falls into the category of unfamiliarity with valid arguments, as students struggle to connect their ideas through structured reasoning that transforms general observations into logical claims

This challenge is highlighted further by S3 interview, who testified:

> *"I find it* ***difficult to test whether my reasoning is valid and free from bias. Sometimes my argument is valid but lacks truthful evidence, so it is not sound.****" (I-S3-UVA).*

S4 also elaborated on the complexity of this challenge, stating:

> *"Feeling* ***challenged in writing critically about validity is how to choose evidence that is correct, relevant, and logical, while keeping my arguments****." (I-S4-UVA).*

The interview results above illustrate students' difficulty in identifying appropriate evidence and integrating it effectively to support their claims. Their limited understanding of the interdependence between logical structure and empirical support often results in reliance on unverifiable assertions (Aizawa et al., 2023). As a result, their arguments are less persuasive, less insightful, and less resilient to counterclaims.

4.1.3 Challenges in Evaluating Soundness Arguments

In critical writing, soundness is a crucial aspect that determines the reliability of an argument. An argument is considered sound not only if its reasoning is valid, but also if its premises are true and relevant. However, many students struggle to evaluate the soundness of their arguments. In practice, they often assume that as long as the reasoning pattern appears valid, the argument is automatically sound, without verifying the validity of the premises used. This results in arguments that appear convincing in form but lack academic rigor. Students also tend to overlook the quality and credibility of the evidence supporting their claims, leaving their arguments vulnerable to rebuttal. This misunderstanding suggests that students confuse validity with soundness, failing to understand that both structure and truth must be present. As a result, their critical writing often lacks depth, as the arguments presented are not grounded in solid evidence. Therefore, a deeper understanding of soundness is crucial in teaching logic and writing, enabling students to construct

arguments that are not only valid but also based on factual and credible premises, as explained further below:

- Inability to use Fact and Premise

  The Inability to Use Facts and Premises Problem (IUFP) highlight a key challenge for students in ensuring their arguments are valid overall. Students struggle to maintain the truth of all premises while keeping the argument valid at the same time. Student (S2) and (S5) explained this balancing act:

Table 4.1.3 Inability to use Fact and Premise

Students' Essay	S	Preliminary Code
Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the ways in which students learn and engage with material. These technologies offer significant advantages such as personalized support, increased engagement, and enhanced creativity. However, concerns have also emerged, particularly about their impact on cognitive processes like critical thinking and memory, as well as on affective elements such as motivation and emotional development. This complexity suggests that while AI has the potential to be a beneficial tool in education, its influence on both cognitive and affective domains must be critically examined.	*"Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the ways in which students learn and engage with material. These technologies offer significant advantages such as personalized support, increased engagement, and enhanced creativity." (D-S5-IUFP)*	Inability to Use Fact and Premise
Generative artificial intelligence (generative artificial intelligence/genai) has become one of the most significant technological innovations in the world of higher education. *Tools such as chatgpt began to be widely used in higher education institutions (Higher Education Institutions/Heis)*	*"Tools such as chatgpt began to be widely used in higher education institutions (Higher Education Institutions/Heis) because of their ability to produce responses such as humans,*	Inability to Use Fact and Premise

because of their ability to produce responses such as humans, compile text, to help in the learning process. Although the use of genai brings many benefits, such as supporting cognitive thinking skills - including critical thinking, creative, reflective, computational, and problem solving - on the other hand also raises concerns about academic integrity, excessive dependence, and declineQuality of students' independent thinking. Given the importance of thinking skills in the world of work today, this study focuses on the positive and negative impacts of the use of genai on the cognitive thinking skills of students and academics in the higher education environment, with the aim of providing insight and guidelines inThe application of genai effectively and ethically in the context of learning.	*compile text, to help in the learning process."* (D-S2-IUFP)	

The table above demonstrates students' inability to use facts and premises, which refers to their difficulty in transforming information into logically supported arguments. Statements from S5 and S2 present factual and descriptive information about the use and benefits of AI tools in education. However, the documentation revealed that students tended to stop stating these facts without developing them into logical premises that support claims or arguments. In other words, although they successfully identified observable realities such as the increasing prevalence and usefulness of ChatGPT, they struggled to connect these observations to broader reasoning processes that explain why or how these facts are important in an argumentative context. This inability reflects a lack of depth in critical

writing and inferential thinking, as students did not use facts to justify and evaluate. Their statements were superficial, serving as mere descriptions, rather than evidence-based premises that could strengthen the validity of an argument. Consequently, their reasoning lacked coherence, progression, and critical engagement with the information presented. Therefore, this problem falls into the category of inability to use facts and premises, because students are unable to integrate factual data into structured reasoning that advances arguments logically and persuasively.

This challenge is highlighted further by S2 interview, who testified:

> *"The* ***challenge is to maintain all premises used correctly and the argument remains valid****." (I-S2-IUFP).*

This shows a challenge in combining factual accuracy with logical structure. The challenge gets more complex because students need to satisfy both conditions truth of premises and structural validity make the argument valid, as student (S5) noted:

> *"****The challenge is to ensure both conditions are met; its difficult to evaluate truth and valid to become soundness****....." (I-S5-IUFP).*

The researcher concluded that this inability reveals a major gap in students' understanding of how empirical facts must align with the formal premises of an argument to form a convincing and logical claim. This inability indicates a significant gap in students' understanding of how empirical facts must align perfectly with the formal premises of an argument (Rizzo and Wilson, 2025). Therefore, students fail to build a strong foundation for their

reasoning, leading to arguments that are logically sound in form but factually weak.

- Unfamiliarity with Premise and Logic

  The issue of Unfamiliarity with Premises and Logic (UPL) highlights students' challenges in constructing logical and strong arguments. Students recognize the need to verify that their premises are not only coherent but also factually correct, as found on S3 and S5 documentation:

Table 4.1.3 Unfamiliarity with Premise and Logic

Students' Essay	S	Preliminary Code
In the era of globalization, the development of artificial intelligence (AI) has had a significant impact on the field of education, including the emergence of generative AI. Generative AI refers to a technology capable of producing text, images, or audio based on previously learned data. In the context of learning, generative AI is increasingly being utilized to create more interactive and personalized teaching and learning experiences. One of the most notable impacts of this technology can be observed in the cognitive and affective domains of students. Many students report greater engagement when learning with responsive and innovative AI tools. However, the implementation of generative AI requires supervision and guidance from educators to prevent potential misuse by students.	*"Generative AI refers to a technology capable of producing text, images, or audio based on previously learned data."* (D-S3-UPL)	Unfamiliarity with Premise and Logic
Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the ways in which students learn and engage with material. These technologies offer significant	*"Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the ways in which students learn*	Unfamiliarity with Premise and Logic

advantages such as personalized support, increased engagement, and enhanced creativity. However, concerns have also emerged, particularly about their impact on cognitive processes like critical thinking and memory, as well as on affective elements such as motivation and emotional development. This complexity suggests that while AI has the potential to be a beneficial tool in education, its influence on both cognitive and affective domains must be critically examined.	*and engage with material."* (D-S5-UPL)	

From the table above, these sentences illustrate students' unfamiliarity with premises and logic, as they present factual definitions and descriptions without demonstrating an understanding of how these can function as fundamental premises in logical reasoning. The statements from both students, S3 and S5, are informative, offering basic explanations of AI concepts and applications. However, the documentation shows that students use these statements simply as stand-alone facts, without connecting them through logical reasoning that leads to conclusions or supports arguments. This demonstrates a lack of understanding of how premises function within a logical framework, that is, as evidence or reasoning that should lead to a valid inference or claim. Consequently, their arguments lack coherence, progression, and logical validity. The lack of inferential relationships between statements indicates that students are not yet accustomed to constructing arguments that rely on a clear logical structure, where each premise builds to a reasoned conclusion. Therefore, this problem falls into

the category of unfamiliarity with premises and logic, as students show challenges in using factual information as a logical basis for argumentation, resulting in descriptive, rather than analytical or inferential, reasoning.

This challenge is highlighted further by S3 interview, who testified:

*"Sometimes **my argument is valid but lacks truthful evidence, so it is not sound. to ensure that all premises are true, not only sound but also consistent with the facts**." (I-S3-UPL).*

Furthermore, the core issue is often rooted in the ambiguity of the premise itself, leading to confusion, where student S5 remarked:

*"Sometimes **my arguments are valid but lack the right evidence, so they are not robust."** (I-S5-UPL).*

From the result of the semi-structured interview above, this problem clearly indicates that students lack a grasp of the principles governing the validity of arguments. Their primary focus is on maintaining the logical flow of their arguments, often neglecting evidence-based premises. Without these skills, their critical writing is vulnerable to being dismissed as mere theory, rather than supported by facts.

4.1.4 Challenges in Understanding Disjunctive Syllogism

In this case, the disjunctive syllogism is a fundamental logical pattern that helps students draw conclusions from two opposing alternatives or three arguments. However, students often struggle to apply this principle effectively. They tend to struggle to ensure that the alternatives presented are truly exclusive and unambiguous. In practice, students sometimes use premises that overlap or do not directly contradict each other, resulting in weak or flawed conclusions. As a result,

their arguments appear incomplete and susceptible to logical fallacies. This suggests that while students may understand the form of the disjunctive syllogism, they still struggle to apply it correctly, as explained further below:

- Inability to Use More Arguments

  Student interviews revealed that students face challenges in identifying logical and valid arguments. This problem was further emphasized in the documentation of (S2) and (S5):

Table 4.1.4 Inability to Use More Arguments

Students' Essay	DS	Preliminary Code
In my opinion, there are as highly important reasons why we should be careful consider the integration of generative artificial intelligence (genai), such as chatgpt, in higher education. First, I argue that the use of chatgpt can enrich students' learning experience through prompt engineering that encourages deeper analysis and evaluation from various perspectives. However, this benefit can only be achieved if students continue to think independently than relying solely on the ai-generated responses. Second, chatgpt used as a guidance-based learning AID (GCLA). *Since it offers prompts instal intead of direct Answers, it gives students space to think independently, explore ideas, and develop innovative*	*"Likewise, the use of genai in academic settings must be approached wisely. While it has the potential to support the development of higher-order thinking skills,* ***it is also*** *carries risk that may have a critical and reflective thinking if missed. " (D-S2-IUMA)*	Inability to Use More Arguments

solutions. Third, Altogh Genai Offers Quick Access to Information and Instant Answers, ITS Uncontrolled Use Without Critical Reflection May Weaken Students' Cognitive Autonomy.		
Furthermore, deductive reasoning tasks reveal deeper cognitive implications of AI use. A brainwave study conducted by MIT indicated that students who used ChatGPT for writing exhibited reduced brain activity, resulting in unoriginal and formulaic output. This lack of mental engagement persisted even when the students were later asked to write independently. Despite this, the affective outcomes can be more positive; some learners report a boost in confidence and creativity when using AI-generated ideas as inspiration rather than final answers. These contrasting findings illustrate the need for a balanced and reflective approach to AI use in learning.	*"This lack of mental engagement persisted even when the students were later asked to write independently.* ***Despite this,*** *the affective outcomes can be more positive; some learners report a boost in confidence and creativity when using AI-generated ideas as inspiration rather than final answers." (D-S5-IUMA)*	Inability to Use More Arguments

From the table above, s2 and s5 show their inability to use more arguments, because they present partially developed ideas without developing them into a comprehensive chain of reasoning supported by various arguments. The statement "Similarly, the use of generative AI in academic settings must be

approached wisely. Although it has the potential to support the development of higher-order thinking skills, AI also contains risks that can hinder critical and reflective thinking if misused." and "This lack of mental engagement persisted even when students were later asked to write independently. However, the affective outcomes could be more positive; some students reported increased confidence and creativity when using AI-generated ideas as inspiration. The documentation revealed that students tended to present surface-level contrasts without providing further evidence that could deepen their reasoning. For example, while the first sentence introduces the dual potential of AI to encourage or inhibit higher-order thinking, it is insufficiently expanded through supporting arguments explaining how or why these effects occur. Similarly, the second sentence identifies cognitive and affective dimensions but fails to integrate them into a coherent argument about the impact of AI on education. This suggests that students struggled to develop a single idea into several coherent arguments, relying instead on juxtaposed brief statements. As a result, their arguments lacked depth and coherence. Therefore, this problem is categorized as an inability to use more arguments, as students were unable to expand their reasoning through additional evidence that builds a logical and well-developed argument.

This challenge is highlighted further by S2:

> *"I have to* ***ensure that both argument choices and premises are completely contradictory and unambiguous but I failed because I was not able to determine or include appropriate premises in my writing****." (I-S2-IUMA).*

Another student expressed a similar sentiment:

*"**The challenge is detecting hidden assumptions in such reasoning** because **I had to extend my arguments but I'm unable to do it**." (I-S5-IUMA)*

The results of the semi-structured interviews above demonstrate that students are aware of their weaknesses in constructing valid arguments and still struggle to overcome them. From these student interviews, the researcher concluded that the inability to utilize a wider range of arguments is one of the most significant obstacles to students' logical reasoning. Students tend to construct arguments without ensuring that their choices are truly logical (Ibrahim, 2022). This often results in weak arguments, lacking depth, and lacking critical evaluation, resulting in poorly structured student writing.

4.1.5 Challenges in Identifying a Thesis

In a critical writing, thesis statement serves as the foundation of the overall argument, guiding the structure and direction of an essay. However, many students struggle to formulate a clear and balanced thesis. They struggle to identify the most appropriate main idea and maintain coherence throughout their writing. Furthermore, when faced with lengthy texts containing a wealth of supporting information, students are often overwhelmed and fail to filter relevant material to effectively support their thesis. These challenges indicate students' lack of skills in distinguishing between main ideas and supporting details. Therefore, writing instruction should emphasize the thesis's role as the backbone of academic writing. Training students to identify, formulate, and defend a strong thesis will improve the

clarity, focus, and persuasiveness of their critical writing, as explained further below:

- Inability to Use Thesis Statement

  Student interviews revealed that some students struggled to formulate a clear thesis statement. In a result of the documentation, the researcher found the relation between their writing result and their interview result. This problem was further emphasized in the documentation of (S2) and (S3):

Table 4.1.5 Inability to Use Thesis Statement

Students' Essay	IT	Preliminary Code
In my perspective, the use of genai can be beneficial if applied critically. First, genai such as chatgpt allows students to explore ideas from multiple disciplines, which can enrich their knowledge and broaden their critical thinking scope. Second, I argue that genai can serve as a powerful tool for self-reflection in the learning process, especially when used to trigger further inquiry or deeper questions. Lastly, the use of Genai without Proper Development of Digital Literacy and Academic ethics may harm the integrity and quality of students' thinking, leading to overdependence and reduced original thought.	*"I argue that the use of chatgpt can enrich students' learning experience through prompt engineering that encourages deeper analysis and evaluation from various perspectives."* (D-S2-IUTS)	Inability to Use Thesis Statement
In my opinion, there are several considerations as to why generative AI has an impact on students' cognitive	*"I argue that the use of generative AI in the cognitive domain can enhance critical thinking, problem-solving*	Inability to Use Thesis Statement

and affective domains. First, I argue that the use of generative AI in the cognitive domain can enhance critical thinking, problem-solving skills, and creativity through interactive engagement with AI-generated content. For instance, students can utilize ChatGPT or other AI platforms to understand academic concepts in a more personalized and adaptive manner. Second, AI is capable of providing instant feedback, which can accelerate students' comprehension more effectively compared to conventional teaching methods. Third, from an affective perspective, students' motivation to learn may increase as AI can present learning materials in more engaging formats, such as interactive visualizations or narratives tailored to students' preferences. Likewise, the use of generative AI in education has the potential to enhance students' cognitive and affective domains through the development of critical thinking skills, the delivery of adaptive learning materials, the presentation of engaging and responsive educational content.	*skills, and creativity through interactive engagement with AI-generated content. For instance, students can utilize ChatGPT or other AI platforms to understand academic concepts in a more personalized and adaptive manner."* (D-S3-IUTS)	

From the table above, sentences S2 and S3 demonstrate the student's inability to use a thesis statement, as they attempt to convey a claim but lack the clarity and focus required for a strong thesis statement. The statements "I argue that the use of ChatGPT can enrich students' learning experiences

through rapid engineering that encourages deeper analysis and evaluation from multiple perspectives." and "I argue that the use of generative AI in the cognitive domain can enhance critical thinking, problem-solving skills, and creativity through interactive engagement with AI-generated content. For example, students can utilize ChatGPT or other AI platforms to understand academic concepts in a more personalized and adaptive way." both express a position through the phrase "I argue that," demonstrating an awareness of critical writing conventions. However, the documentation indicates that the student failed to construct these thesis statements effectively, as they are overly descriptive and lack clear direction supported by strong evidence. In these examples, the student simply states the general benefits of AI without addressing possible limitations, conditions, or rebuttals that could make the thesis more balanced and critical. This reflects that students understand the form of a thesis, but not its function as the central controlling idea that guides the argument throughout the text. As a result, their writing lacks coherence and depth. Therefore, this problem is categorized as an inability to use a thesis statement, as students struggle to formulate a strong, logically structured central claim that effectively supports their overall argument.

This challenge is highlighted further by S2:

"*The **challenge is to distinguish between the main ideas and supporting ideas**, as well as **ensuring that the thesis chosen really represents the core of the argument** but **I missed to present the topic without writing the thesis statement**. (I-S2-IUTS).*

Also elaborated on the complexity of this challenge, stating:

*"The **challenge is that sometimes the thesis is implied and must be written in the first paragraph, not stated directly but myself failed to write it because I always directly state my arguments**." (I-S3-IUTS).*

Another student expressed a similar sentiment, these statements suggested that while students may understand the importance of having a thesis as the backbone of their writing, they struggle to determine which idea should be the main point. The results of the semi-structured interviews above indicate that students are aware of their weaknesses in determining an appropriate thesis.

- Unfamiliarity with Sources Thesis

  Semi-structured interviews revealed that some students experienced difficulty managing reading sources when developing their theses. This problem was further emphasized in the documentation of (S3) and (S5):

Table 4.1.5 Unfamiliarity with Sources Thesis

Students' Essay	IT	Preliminary Code
In my opinion, there are several considerations as to why generative AI has an impact on students' cognitive and affective domains. First, I argue that the use of generative AI in the cognitive domain can enhance critical thinking, problem-solving skills, and creativity through interactive engagement with AI-generated content. For instance, students can utilize ChatGPT or other AI platforms to understand academic concepts in a	*"The use of generative AI in education has the potential to enhance students' cognitive and affective domains through the development of critical thinking skills, the delivery of adaptive learning materials, the presentation of engaging and responsive educational content."* (D-S3-UST)	Unfamiliarity with Sources Thesis

more personalized and adaptive manner. Second, AI is capable of providing instant feedback, which can accelerate students' comprehension more effectively compared to conventional teaching methods. Third, from an affective perspective, students' motivation to learn may increase as AI can present learning materials in more engaging formats, such as interactive visualizations or narratives tailored to students' preferences. Likewise, the use of generative AI in education has the potential to enhance students' cognitive and affective domains through the development of critical thinking skills, the delivery of adaptive learning materials, the presentation of engaging and responsive educational content.		
When constructing extended arguments, students can engage in multi-step reasoning with the aid of generative AI. However, studies have shown that overdependence on AI can lead to weakened critical thinking and poor judgment, especially when students rely uncritically on AI-generated answers. On the other hand, when AI is integrated effectively—alongside guidance and scaffolding from	*"**On the other hand**, when AI is integrated effectively along side guidance and scaffolding from educators it can improve students' cognitive performance."* (D-S5-UST)	Unfamiliarity with Sources Thesis

educators—it can improve students' cognitive performance. In particular, research has found that constructive interaction with AI systems can increase motivation and build self-efficacy.		

From the table above, sentences s3 and s5 demonstrate students' unfamiliarity with premises and logic, as they present ideas that appear conceptually strong but lack the logical structure and coherence necessary to form a reasoned argument. The statements "The use of generative AI in education has the potential to enhance students' cognitive and affective domains through the development of critical thinking skills, adaptive delivery of learning materials, and the presentation of engaging and responsive educational content." and "On the other hand, when AI is effectively integrated with guidance and scaffolding from educators, it can improve students' cognitive performance." indicate that students can identify relevant educational benefits of AI, but they fail to organize these ideas through logical reasoning or clear premise-conclusion relationships. The documentation results show that these sentences primarily consist of assertive claims without supporting premises justifying how or why these outcomes occur. For example, while the first statement lists potential benefits of AI, it does not establish any causal or conditional reasoning to support the claim. Similarly, the second statement uses a contrastive marker ("On the other hand") but lacks an explicit preliminary argument to complete the logical connection, resulting in a disjointed line of reasoning.

This demonstrates students' limited familiarity with constructing arguments that follow a clear logical progression, where premises build toward a conclusion. Their reasoning remains descriptive and unstructured. Therefore, this issue falls under the category of unfamiliarity with premises and logic, as students are unable to use premises as a foundation for coherent reasoning, resulting in their argument lacking logical continuity and overall argumentative validity.

This challenge is highlighted further by S2:

> *"I find **it challenging when the text is lengthy and full of supporting information, so I unable to construct source for my thesis statement**" (I-S5-UST)*

Another student expressed a similar statement by S3:

> *"I often **feel confused about how to select the most relevant parts of a source to support arguments meaning I have problem constructing a thesis source**." (I-S3-UST).*

These two statements illustrate that students are often overwhelmed when faced with lengthy, information texts, making them unable to select truly relevant information to support their arguments with source of thesis statement. Students tend to copy information directly or include too much detail in their writing. As a result, the essays appear rich in data but lose focus because the information is not logically integrated with the thesis (Chaffee, 2010). The documentation of student critical writing supports these interview findings. However, students do not include premises in their essay paragraphs. Paragraphs that should support their thesis instead become a collection of information without a clear premise. This results in a disorganized paragraph structure, as the information stands alone without

any critical analysis. Thus, students' weaknesses in managing sources are not only related to technical reading skills, but also to critical thinking skills in selecting, filtering, and connecting information to truly strengthen the thesis.

Based on the findings above, the researcher concluded that the main challenge facing students in critical thinking in critical writing lies in their limitations in understanding, constructing, and evaluating meaning, arguments, and logical structures in depth. Students tend to write descriptively rather than analytically, as they are unable to interpret implied meaning, use premises and facts as the basis for valid and sound reasoning. This inability and unfamiliarity often results in their arguments being illogical, incoherent, and lacking evidence-based support, thus causing their writing to lack persuasive power and analytical depth. Furthermore, the challenge of identifying and developing a clear thesis statement demonstrates students' weak ability to organize main ideas and establish relationships between claims, reasons, and evidence. These obstacles indicate that students' critical thinking skills have not been internalized in academic writing practices, as they are not yet accustomed to linking facts with logic or reflectively assessing the validity and validity of arguments.

4.2 Discussion

The findings of this study indicate that nearly all students face challenges in applying critical thinking skills to their writing. Documentation of student-written essays reveals that most of the writing remains incomplete, both in terms of structure and depth of argument. This indicates that students struggle to develop

ideas coherently and organize them into strong, logical arguments. These deficiencies in writing align with the results of semi-structured interviews, in which students directly acknowledged challenges in understanding contextual meaning, constructing valid premises, and distinguishing between validity and truth of arguments. This connection between documentation and interview data strengthens the validity of the study's findings, as both consistently demonstrate weaknesses in the application of critical thinking in critical writing. This finding aligns Rosalia, (2025), who stated that critical thinking barriers in first-year students often manifest in difficulties in constructing consistent and logical arguments. A similar pattern was reported by Shaw et al (2020), who found that students' critical thinking weaknesses were often reflected in incomplete or poorly reasoned arguments due to limited feedback and task design. Furthermore, Barjesteh and Niknezhad (2020) emphasized that students' ability to produce logically structured academic writing is closely related to their level of critical thinking skills.Thus, this study demonstrates that students' weaknesses in critical writing are fundamental and require more systematic learning strategies.

However, this study also found interesting differences between the documentation and interview results. In some cases, students were able to produce essays with a more complete structure. However, when interviewed, the same students admitted that they still faced significant challenges in critical thinking while writing, such as difficulty determining the main thesis, interpreting implicit meanings, or filtering relevant information. This difference can be interpreted as a gap between the final written product and the critical thinking process they

experienced. In other words, although some students were able to produce essays that appeared complete in writing, this did not always reflect the maturity of their critical thinking. Kic-drgas (2025) found a similar phenomenon, where the use of technology in writing enabled students to produce texts that appeared structurally neat, but weakened critical reflection in the thinking process. This interpretation is further supported by Murtadho (2021), who emphasized that AI-based writing systems can create the illusion of cognitive sophistication while masking deficiencies in genuine analytical reasoning. Furthermore, Saulius and Malinauskas (2021), suggested that effective evaluation of students' critical writing should include process-based assessments to uncover deeper cognitive engagement. Therefore, the results of this study emphasize the need to assess critical writing not only based on the product, but also by exploring the process that students undergo.

These conditions indicate that students' critical writing skills need to be assessed not only from the final text but also from the underlying thought processes. Documentation reveals what is visible in writing, while interviews provide a deeper understanding of students' awareness of the challenges they face. These findings reinforce the importance of using dual methods in research, as the combination of documentation and interviews can provide a more comprehensive picture of students' challenges. Furthermore, these results emphasize that developing critical thinking skills in writing requires a pedagogical approach that focuses not only on written products but also trains critical thinking processes from the initial stages, from reading and interpreting to organizing arguments. Rebelo (2025) emphasizes that effective critical writing learning must integrate reflective practice and higher-

order thinking skills to strengthen the quality of students' arguments. Supporting this view, Saradgah et al (2020) noted that dual-modality assessments combining written work and reflective observation provide a more accurate representation of students' cognitive development. Thus, writing learning not only produces neat text but also trains students to be more reflective, analytical, and critical in their thinking.

CHAPTER V

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study aims to investigate students' challenges in implementing critical thinking skills in critical writing. Documentation of essay texts revealed that most students' writing was incomplete in terms of both structure and depth of argument. This condition indicates that students struggle to develop ideas coherently, construct valid premises, and construct logical and convincing arguments. The results of semi-structured interviews supported this finding, as students themselves acknowledged challenges in understanding contextual meaning, distinguishing validity from truth, and constructing a clear thesis. Thus, this study confirms a fundamental weakness in the application of critical thinking that directly impacts the quality of students' academic writing.

In addition to demonstrating consistency between documentation and interviews, this study also uncovered interesting differences. In some cases, students were able to produce more structured writing, but during interviews, they still acknowledged difficulties applying critical thinking. This indicates a gap between the written product and the students' actual critical thinking process. This discrepancy suggests that essays that appear structurally sound do not always reflect the depth of students' critical reflection. In other words, assessing critical writing ability is not sufficient solely on the final product; it must also involve evaluating the underlying thought process.

The findings of this study also confirm that students' challenges in critical writing encompass various aspects, ranging from difficulty understanding contextual meaning, using valid premises, distinguishing validity from soundness, to constructing a coherent thesis. These obstacles indicate that students are still in the early stages of developing academic critical thinking skills. Furthermore, linguistic and cognitive factors also influence the quality of their writing, resulting in arguments often tending toward descriptive rather than analytical ones. This demonstrates the need for a more systematic learning approach to fostering students' critical thinking skills.

Overall, this study concludes that developing critical thinking in critical writing should emphasize a balance between product and process. Documentation of student essays provides a concrete picture of the quality of writing, while interviews help uncover deeper thought processes. These two methods complement each other and provide a comprehensive picture of students' challenges. Therefore, writing teaching strategies should not only focus on the final product but also train students in the critical thinking process from reading, interpreting, and organizing arguments. This is expected to develop writing skills that are not only structurally sound but also reflective, analytical, and grounded in strong critical thinking.

5.2 Recommendation

1. For Lecturers

   Lecturers are advised to provide critical writing instruction that emphasizes the process, not just the end product. This can be achieved by increasing critical reading exercises, text analysis, and reflective discussions about the

validity and soundness of arguments. Furthermore, integrating project-based pedagogical strategies and digital technologies that support critical reflection can help students hone their logic and argumentation skills.

2. For students

   Students are advised to practice critical reading of academic texts, focusing on understanding contextual meaning, identifying theses, and constructing arguments based on valid premises. Students also need to practice reflective writing, rather than simply copying information, so that their writing is more analytical than descriptive. Actively evaluating arguments, both their own and others', will help strengthen critical thinking skills in writing.

3. For further researchers

   Future researchers are advised to broaden their research focus by including more diverse contexts, for example, comparing students' critical writing skills across study programs or universities. Furthermore, research could employ a longitudinal approach to assess the development of students' critical thinking skills over time. The use of additional instruments, such as *think-aloud protocols* or analysis of academic writing software, could also provide deeper insights into students' critical thinking processes.

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APPENDICES

Appendix I

Documentation Guidelines

In this study, documentation refers to the collection and analysis of student essays produced during classroom practicums in the Critical Writing course. The researcher selected essays from student coursework, with a particular focus on critical writing, as these texts provided relevant data for analyzing critical thinking indicators. Each essay was kept in its original form as submitted by the student, without modification or correction, to maintain the authenticity of the data. Furthermore, the collected essays were organized by labeling and categorizing them based on student codes to ensure confidentiality and the feasibility of systematic analysis. The collected essays were then analyzed based on the four critical thinking indicators proposed by Chaffee (2010), namely Recognizing Arguments, Evaluating Arguments, Understanding Deductive Arguments, and Constructing Extended Arguments.

Note:

1. Recognizing Arguments (Cause and Effect)
    a. Cue Word
    b. Contextual Meaning
2. Evaluating Arguments (Credibility)
    a. Truth
    b. Validity
    c. Soundness
3. Understanding Deductive Arguments (Grasping a Premise)

a. Application of a General Rule
b. Model Ponens
c. Model Tollens
d. Disjunctive Syllogism (DS) for (Premise)

4. Constructing Extended Arguments: (Writing Conclusion)
    a. Identifying a thesis (IT) for (Premis
    b. Conducting Research
    c. Evaluating Sources
    d. Organizing Idea

Appendix II

The Documentation Sheet

(Chaffee, 2010)

Note:

CW	: Cue Words	MT	: Modus Tollens
CM	: Contextual Meaning	DS	: Disjunctive Syllogism
T	: Truth	IT	: Identifying a Thesis
V	: Validity	CR	: Conducting Research
S	: Soundess	ES	: Evaluating Sources
AGR	: Application of a General Rule	OI	: Organizing Idea
MP	: Modus Ponens		

Students' Essay (Documentation text)	**Recognizing Arguments**				Preliminary Code	Code
	CW		**CM**			
Student 1 The development of generative AI technology, particularly ChatGPT, has had a significant impact on how students develop critical thinking skills in higher education. On the one hand, AI helps simplify complex concepts and increases learning engagement. However, on the other hand, excessive reliance on AI has the potential to undermine students' intellectual autonomy. In this context, it is important to review traditional learning approaches, such as Bloom's Taxonomy, to be more responsive to the cognitive and	There is a Cue Word. According to Chaffe (2010), the Recognizing Argument component indicates the presence of a Cue Word. "*However, on the other hand, excessive reliance on AI has the potential to undermine students' intellectual autonomy.*" This sentence suggests the cue word "***However"***.	✓	There is no Contextual meaning. "*On the one hand, AI helps simplify complex concepts and increases learning engagement.* ***However,*** *on the other hand, excessive reliance on AI has the potential to undermine."* These sentences lack contextual meaning because they only reveal a contrasting relationship through cue words without providing any contextual information.	✗	Inability to Implied Meaning	S1-IIM

affective needs of AI-assisted learning environments. A study by Gonsalves (2024) shows that the use of AI affects not only the cognitive domain but also the affective domain, such as emotional engagement and collaboration, which are crucial for the quality of students' critical thinking.						
Student 2 Generative artificial intelligence (generative artificial intelligence/genai) has become one of the most significant technological innovations in the world of higher education. Tools such as chatgpt began to be widely used in higher education institutions (Higher Education Institutions/Heis) because of their ability to produce responses such as humans, compile text, to help in the learning process. Although the use of genai brings many benefits, such as supporting cognitive thinking skills - including critical thinking, creative, reflective, computational, and problem solving - on the other hand also raises concerns about academic integrity, excessive dependence, and declineQuality of students' independent thinking. Given the importance of thinking skills in the world of work today, this study focuses on the positive and negative impacts of	There is a Cue Word. According to Chaffe (2010), the Recognizing Argument component indicates the presence of a Cue Word. "*Although the use of genai brings many benefits, such as supporting cognitive thinking skills - including critical thinking, creative, reflective, computational, and problem solving, on the other hand also raises concerns about academic integrity, excessive dependence, and declineQuality of students' independent thinking."* This sentence suggests the Cue Word "***Although***".	✓	There is no Contextual Meaning. "*Tools such as ChatGPT began to be widely used in higher education institutions (Higher Education Institutions/Heis) Because of their ability to produce responses such as humans, compile text, to help in the learning process. Although the use of genai brings many benefits, such as supporting cognitive thinking skills - including critical thinking,*	✗	Inability to Implied Meaning	S2-IIM

the use of genai on the cognitive thinking skills of students and academics in the higher education environment, with the aim of providing insight and guidelines inThe application of genai effectively and ethically in the context of learning.						
Students 3 In the era of globalization, the development of artificial intelligence (AI) has had a significant impact on the field of education, including the emergence of generative AI. Generative AI refers to a technology capable of producing text, images, or audio based on previously learned data. In the context of learning, generative AI is increasingly being utilized to create more interactive and personalized teaching and learning experiences. One of the most notable impacts of this technology can be observed in the cognitive and affective domains of students. Many students report greater engagement when learning with responsive and innovative AI tools. However, the implementation of generative AI requires supervision and guidance from educators to prevent potential misuse by students.	There is a Cue Word. According to Chaffe (2010), the Recognizing Argument component indicates the presence of a Cue Word. "*However, the implementation of generative AI requires supervision and guidance from educators to prevent potential misuse by students."* This sentence suggests the Cue Word "***However***".	✓	There is no Contextual Meaning. "*Many students report greater engagement when learning with responsive and innovative AI tools. However, the implementation of generative AI requires supervision and guidance from educators to prevent potential misuse by students.*" These sentences lack contextual meaning because they only reveal a contrasting relationship through cue words without providing any contextual information.	✗	Inability to Implied Meaning	S3-IIM

Student 4 One significant advancement in educational technology is the impact of generative artificial intelligence (Generative AI) on students' cognitive and affective domains. As a tool capable of producing human-like content and interactions, generative AI affects not only how students absorb and retain information but also their emotional and motivational states. Given that educational institutions are increasingly integrating AI technologies into their learning processes, I believe it is imperative to understand these effects. While the affective domain includes motivation, feelings, and attitudes, the cognitive domain involves mental abilities such as reasoning, memory, and problem-solving.	There is no Cue Word. "*One significant advancement in educational technology is the impact of generative artificial intelligence (Generative AI) on students' cognitive and affective* ***domains. As a tool*** *capable of producing human-like content and interactions, generative AI affects not only how students absorb and retain information but also their emotional and motivational states.*" These sentences does not contain a cue	✗	There is no Contextual Meaning. "*One significant advancement in educational technology is the impact of generative artificial intelligence* ***(Generative AI) on students' cognitive and affective domains. As a tool capable of producing humanlike content and interactions,*** *generative AI affects not only how students absorb and retain information but also their emotional and motivational states.*" These sentences lack contextual meaning because they are more descriptive and informative without providing any contextual information.	✗	Inability to Use Cue Word Inability to Implied Meaning	S4-IUCW S4-IIM
Student 5 Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the ways in which students learn and engage with material. These technologies offer significant advantages such as personalized support, increased engagement, and enhanced creativity. However, concerns have also emerged,	There is a Cue Word. According to Chaffe (2010), the Recognizing Argument component indicates the presence of a Cue Word. "*However, concerns have also emerged, particularly about their impact on cognitive processes like critical thinking and memory, as well as on*	✓	There is no Contextual Meaning. "*These technologies offer significant advantages— such as personalized support, increased engagement, and enhanced creativity. However, concerns have also emerged, particularly about their impact on cognitive processes like critical thinking and memory, as well as on affective*	✗	Inability to Implied Meaning	S5-IIM

particularly about their impact on cognitive processes like critical thinking and memory, as well as on affective elements such as motivation and emotional development. This complexity suggests that while AI has the potential to be a beneficial tool in education, its influence on both cognitive and affective domains must be critically examined.	*affective elements such as motivation and emotional development.* This sentence suggests the "***However***".		*elements such as motivation and emotional development."* These sentences lack contextual meaning because they only reveal a contrasting relationship through cue words without providing any contextual information.			

Students' Essay (Documentation text)	**Evaluating Arguments**						**Preliminary Code**	**Code**
	T		**V**		**S**			
Student 1 The development of generative AI technology, particularly ChatGPT, has had a significant impact on how students develop critical thinking skills in higher education. On the one hand, AI helps simplify complex concepts and increases learning engagement. However, on the other hand, excessive reliance on AI has the potential to undermine students' intellectual autonomy. In this context, it is important to review traditional learning approaches, such as Bloom's Taxonomy, to be more responsive to the cognitive and affective needs of AI-assisted learning environments. A study by Gonsalves (2024) shows that the use of AI affects not only the cognitive domain but also the affective	There is a Truth. "*In this context, it is important to review traditional learning approaches, such as Bloom's Taxonomy, to be more responsive to the cognitive and affective needs of AI-assisted learning environments.*" This sentence is true because the statement contains a logical truth.	✓	There is Validity. "*According to Gonsalves (2024), the use of AI affects not only the cognitive domain but also the affective domain, such as emotional engagement and collaboration, which are crucial for the quality of students' critical thinking.*" Truth can be considered to have validity because there are reference sources to confirm that the truth has been empirically and academically tested. Therefore, this truth is valid.	✓	There is Soundness because it has Truth and Valid	✓	Knowledge of Evaluating Arguments	S1-KEA

domain, such as emotional engagement and collaboration, which are crucial for the quality of students' critical thinking.								
Student 2 Generative artificial intelligence (generative artificial intelligence/genai) has become one of the most significant technological innovations in the world of higher education. Tools such as chatgpt began to be widely used in higher education institutions (Higher Education Institutions/Heis) because of their ability to produce responses such as humans, compile text, to help in the learning process. Although the use of genai brings many benefits, such as supporting cognitive thinking skills - including critical thinking, creative, reflective, computational, and problem solving - on the other hand also raises concerns about academic integrity, excessive dependence, and declineQuality of students' independent thinking. Given the importance of thinking skills in the world of work today, this study focuses on the positive and negative impacts of the use of genai on the cognitive thinking skills of students and academics in the higher education environment, with the aim of providing insight and guidelines inThe application of	There is Truth. "*Generative artificial intelligence (generative artificial intelligence /genai) has become one of the most significant technological innovations in the world of higher education.*" This sentence is true because the statement contains a logical truth.	✓	There is no Validity because the student did not provide a reference citation to strengthen the Truth. "*Generative artificial intelligence (generative artificial intelligence/genai) has become one of the most significant technological innovations in the world of higher education.*" This sentence is supposed to be strongly supported by evidence	✗	There is no Soundness because there is no Validity. Truth can be understood as a true statement, but a truth cannot be considered sound if it is not accompanied by validity, because validity is the evidence or basis that strengthens that truth. Conversely, a valid argument cannot be called sound if it does not contain truth. In other words, truth and validity must go hand in hand for a statement to be considered sound.	✗	Inability to Use Premise Unfamiliarity with Valid Arguments Inability to Use Fact and Premise Unfamiliarity with Premise and Logic	S2-IUP S2-UVA S2-IUFP S2-UPL

genai effectively and ethically in the context of learning.								
Students 3 In the era of globalization, the development of artificial intelligence (AI) has had a significant impact on the field of education, including the emergence of generative AI. Generative AI refers to a technology capable of producing text, images, or audio based on previously learned data. In the context of learning, generative AI is increasingly being utilized to create more interactive and personalized teaching and learning experiences. One of the most notable impacts of this technology can be observed in the cognitive and affective domains of students. Many students report greater engagement when learning with responsive and innovative AI tools. However, the implementation of generative AI requires supervision and guidance from educators to prevent potential misuse by students.	There is Truth. "*Many students report greater engagement when learning with responsive and innovative AI tools.*" This sentence is true because the statement contains a logical truth.	✓	There is no Validity because the student did not provide a reference citation to strengthen the Truth. *"Many students report greater engagement when learning with responsive and innovative AI tools."* This sentence is supposed to be strongly supported by evidence	✗	There is no Soundness because there is no Validity. Truth can be understood as a true statement, but a truth cannot be considered sound if it is not accompanied by validity, because validity is the evidence or basis that strengthens that truth. Conversely, a valid argument cannot be called sound if it does not contain truth. In other words, truth and validity must go hand in hand for a statement to be considered sound.	✗	Inability to Use Premise Unfamiliarity with Valid Arguments Inability to Use Fact and Premise Unfamiliarity with Premise and Logic	S3-IUP S3-UVA S3-IUFP S3-UPL
Student 4 One significant advancement in educational technology is the impact of	There is Truth. "*While the affective domain includes*	✓	There is no Validity because the student did not provide a reference citation to strengthen the	✗	There is no Soundness because there is no Validity. Truth can	✗	Inability to Use Premise	S4-IUP

generative artificial intelligence (Generative AI) on students' cognitive and affective domains. As a tool capable of producing human-like content and interactions, generative AI affects not only how students absorb and retain information but also their emotional and motivational states. Given that educational institutions are increasingly integrating AI technologies into their learning processes, I believe it is imperative to understand these effects. While the affective domain includes motivation, feelings, and attitudes, the cognitive domain involves mental abilities such as reasoning, memory, and problem-solving.	*motivation, feelings, and attitudes, the cognitive domain involves mental abilities such as reasoning, memory, and problem-solving.*" This sentence is true because the statement contains a logical truth.		Truth. "*While the affective domain includes motivation, feelings, and attitudes, the cognitive domain involves mental abilities such as reasoning, memory, and problem-solving.*" This sentence is supposed to be strongly supported by evidence		be understood as a true statement, but a truth cannot be considered sound if it is not accompanied by validity, because validity is the evidence or basis that strengthens that truth. Conversely, a valid argument cannot be called sound if it does not contain truth. In other words,		Unfamiliarity with Valid Arguments Inability to Use Fact and Premise Unfamiliarity with Premise and Logic	S4-UVA S4-IUFP S4-UPL
Student 5 Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the ways in which students learn and engage with material. These technologies offer significant advantages such as personalized support, increased engagement, and enhanced creativity. However, concerns have also emerged, particularly about their impact on cognitive processes like critical thinking and memory, as well as on affective elements such as	There is Truth. "*Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the ways in which students learn and engage with material.*" This sentence is true because the statement	✓	There is no validity because the student did not provide a reference citation to strengthen the Truth. "*Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the ways in which students learn and engage with material.*" This sentence is supposed to be	✗	There is no Soundness because there is no Validity. Truth can be understood as a true statement, but a truth cannot be considered sound if it is not accompanied by validity, because validity is the evidence or	✗	Inability to Use Premise Unfamiliarity with Valid Arguments Inability to Use Fact and Premise Unfamiliarity with Premise and Logic	S5-IUP S5-UVA S5-IUFP S5-UPL

motivation and emotional development. This complexity suggests that while AI has the potential to be a beneficial tool in education, its influence on both cognitive and affective domains must be critically examined.	contains a logical truth.		strongly supported by evidence		basis that strengthens that truth. Conversely, a valid argument cannot be called sound if it does not contain truth. In other words,			

Students' Essay (Documentation text)	**Understanding Deductive Arguments**								**Preliminary Code**	**Code**
	AGR		MP		MT		DS			
Student 1	There is argument 1. "*First, students who actively use AI demonstrate developed cognitive abilities, particularly when validating the information provided by ChatGPT.*" This argument is make senses because it aligns with the general rule that active engagement with learning resources trains cognitive skills.	✓	There is argument 2. "*Second, for example, they do not immediately accept the AI's answers at face value, but instead conduct further research in journals or scientific articles to ensure the accuracy of the data.*" This argument is valid and suggests that direct verification behavior leads to improved critical thinking skills.	✓	There is argument 3. "*Third, in addition to the cognitive dimension, the affective dimension is also evident in students' ethical attitude for example, they are careful not to copy directly from the AI and choose to adapt answers to their own style to maintain academic integrity.*" This argument is valid, suggesting that students' ethical attitudes	✓	There is a premise. "Gonsalves (2024), *the use of AI can improve students' critical thinking skills if accompanied by reflective engagement and adaptive learning strategies*." This premise serves to emphasize and complement each related argument to ensure soundness.	✓	Knowledge of Deductive Arguments	S1-KDA

					demonstrate affective engagement in the use of AI.					
Student 2	There is argument 1. "*First, genai such as ChatGPT allows students to explore ideas from multiple disciplines, which can enrich their knowledge and broaden their critical thinking scope.*" This argument is valid because it follows the general rule that interdisciplinary engagement enriches knowledge and critical thinking.	✓	There is argument 2. "*Second, I argue that genai can serve as a powerful tool for self-reflection in the learning process, especially when used to trigger further inquiry or deeper questions.*" This argument is valid because GenAI's triggering of reflective questions supports the enhancement of critical thinking.	✓	There is argument 3. "*Lastly, the use of Genai without Proper Development of Digital Literacy and Academic ethics may harm the integrity and quality of students' thinking, leading to overdependence and reduced original thought.*" This argument is valid because without literacy and ethics, the use of GenAI reduces the quality of originality and integrity of thought.	✓	There is a premise. "*Moongela et al. (2025) Warned that Students' Might Become Passive Learners Who Accept Information Without Verification or Analysis.*" This premise serves to emphasize and complement each related argument to ensure soundness.	✗	Knowledge of Application General Rule Inability to Use More Arguments Unfamiliarity with Logical Arguments	S2-KAGR S2-IUMA S2-ULA
Student 3	There is argument 1. "First, I argue that the use of generative AI may lead to student dependency, thereby diminishing their critical thinking skills and learning	✓	There is argument 2. "Second, some students tend to use AI merely to generate answers without fully understanding the underlying	✓	There is argument 3. "Third, not all responses provided by AI are accurate or contextually appropriate in relation to the given questions." This	✓	There is no a premise. This premise is complementary to the three arguments. Therefore, if one of them is not well-structured, the absence	✗	Knowledge of Application General Rule Inability to Use More Arguments	S2-KAGR S2-IUMA

	motivation." This argument is valid because it follows the general rule that reliance on GenAI can undermine critical thinking and motivation to learn.		concepts." This argument is valid because using GenAI solely to generate answers without understanding the concepts contributes to a loss of in-depth understanding.		argument is valid because the inaccuracy of AI's answers demonstrates the limitations of its context and reliability.		of this premise makes the overall analysis valid but not fully sound according to the established indicators.		Unfamiliarity with Logical Arguments	S2-ULA
Student 4	There is argument 1. "*I argue that generative AI not only facilitates more effective mastery of content but also fosters creativity and active engagement in the learning process.*" This argument is valid because it follows the general rule that utilizing GenAI can facilitate content mastery while encouraging creativity and active student engagement.	✓	There is argument 2. "*I believe this argument should be expanded to consider how AI can improve student motivation and reduce anxiety through personalized learning experiences and empathetic responses, both of which positively affect the affective domain.*" This argument is valid because personalized learning and empathetic responses through GenAI	✓	There is no argument 3. There are only two deductive arguments in this paragraph, and both are well-formed. Therefore, even though there is no third argument, it does not invalidate either argument. However, it cannot be considered sound because the previously established indicators categorize the three arguments as complementary.	✗	There is no a premise. This premise is complementary to the three arguments. Therefore, if one of them is not well-structured, the absence of this premise makes the overall analysis valid but not fully sound according to the established indicators.	✗	Inability to Use Thesis Statement Unfamiliarity with Sources Thesis	S5-IUTS S5-UST

			support increased motivation and reduced anxiety, which have a positive impact on the affective domain.						
Student 5	There is no argument 1.	✗	There is no argument 2	✗	There is no argument 3	✗	There is no a premise. This premise is complementary to the three arguments. Therefore, if one of them is not well-structured, the absence of this premise makes the overall analysis valid but not fully sound according to the established indicators.	✗	Inability to Use Thesis Statement Unfamiliarity with Sources Thesis	S5-IUTS S5-UST

Appendix III

The Result of Students' Thematizing & Coding

(Chaffee, 2010)

Aspects	Theme	Code	Total	Students
Recognizing Arguments		**RA**		
	a. Cue Word	**RA-CW**	**1**	**4**
	b. Contextual Meaning	**RA-CM**	**5**	**1,2,3,4,5**
Evaluating Arguments		**EA**		
	a. Truth	**EA-T**		
	b. Validity	**EA-V**	**4**	**2,3,4,5**
	c. Soundness	**EA-S**	**4**	**2,3,4,5**
Understanding Deductive Arguments		**UDA**		
	a. Application of a General Rule	**UDA-AGR**	**1**	**5**
	b. Model Ponens	**UDA-MP**	**1**	**5**
	c. Model Tollens	**UDA-MT**	**2**	**4,5**
	d. Disjunctive Syllogism	**UDA-DS**	**4**	**2,3,4,5**

Constructing Extended Arguments	**a. Identifying a Thesis** **b. Conducting Research** **c. Evaluating Sources** **d. Organizing Idea**	**CEA** **CEA-IT** **CEA-CR** **CEA-ES** **CEA-OI**	**3** **2** **2** **2**	**2,3,5** **4,5** **4,5** **4,5**

Appendix IV

Semi-structured Interview Guidelines

The purpose of a Semi-structured interview is to find out the students' challenges of critical thinking in critical writing that refers to Recognizing Arguments, Evaluating Arguments, Understanding Deductive Arguments, and Constructing Extended Arguments.

No	Aspects	Indicators	The Purpose of the Question	Item Number	source
1.	Recognizing Arguments	a. Cue Words b. Contextual Meaning	To find out the students' challenges of critical thinking in critical writing of Recognizing Arguments aspects.	1,2 3,4	(Chaffee, 2010)
2.	Evaluating Arguments	a. Truth b. Validity c. Soundness	To find out the students' challenges of critical thinking in critical writing of Evaluating Arguments aspects.	5,6 7,8 9,10	(Chaffee, 2010)
3.	Understanding Deductive Arguments	a. Application of a general rule (AGR) b. Modus Ponens (MP) c. Modus Tollens (MT) d. Disjunctive Syllogism (DS)	To find out the students' challenges of critical thinking in critical writing of Understanding Deductive Arguments aspects.	11, 12 13,14 15,16 17,18	(Chaffee, 2010)
4.	Constructing Extended Arguments	a. Identifying a thesis (IT) b. Conducting research (CR) c. Evaluating sources (ES)	To find out the students' challenges of critical thinking in critical writing of Constructing Extended Arguments aspects.	19,20 21,22 23,24 25,26	(Chaffee, 2010)

		d. Organizing ideas (OI)			

Students Interview Questions

1. In terms of Cue Words, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!
2. What makes you find it challenging while doing Critical Writing in terms of Cue Words? Explain!
3. In terms of Contextual Meaning, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!
4. What makes you find it challenging while doing Critical Writing in terms of Contextual Meaning? Explain!
5. In terms of Truth, what do you now about it? And what challenges do you encounter related to it in Critical Writing? Explain!
6. What makes you find it challenging while doing Critical Writing in terms of Truth? Explain!
7. In terms of Validity, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!
8. What makes you find it challenging while doing Critical Writing in terms of Validity? Explain!
9. In terms of Soundness, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!

10. What makes you find it challenging while doing Critical Writing in terms of Soundness? Explain!
11. In terms of the Application of a general rule, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!
12. What makes you find it challenging while doing Critical Writing in terms of the Application of a general rule? Explain!
13. In terms of Model Ponens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!
14. What makes you find it challenging while doing Critical Writing in terms of Model Ponens? Explain!
15. In terms of Model Tollens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!
16. What makes you find it challenging while doing Critical Writing in terms of Model Tollens? Explain!
17. In terms of Disjunctive Syllogism, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!
18. What makes you find it challenging while doing Critical Writing in terms of Disjunctive Syllogism? Explain!
19. In terms of Identifying a thesis, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!
20. What makes you find it challenging while doing Critical Writing in terms Identifying a thesis? Explain!

21. In terms of Conducting Research, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!
22. What makes you find it challenging while doing Critical Writing in terms of Conducting Research? Explain!
23. In terms of Evaluating Sources, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!
24. What makes you find it challenging while doing Critical Writing in terms of Evaluating Sources? Explain!
25. In terms of Organizing Ideas, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!
26. What makes you find it challenging while doing Critical Writing in terms of Organizing Ideas? Explain!

Appendix V

Student's Interview Transcript

Participant Student 1 (IM)

Date: 26 September 2025

Time: 15.00-16.00

Place: Classroom

Student's & Researcher Code	Statement (Raw Data)	Preliminary Code	Final Code
R	1. In terms of Cue Words, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*Cue words are **signal words that show the relationship between ideas, such as however, therefore, because.** They help maintain the logic of the writing so it is not confusing.*	Konwledge of Signal Words	S1-KSW
R	2. What makes you find it challenging while doing Critical Writing in terms of Cue Words? Explain!		
S-1	Signal words such as *however* and *therefore* **have different functions,** and I understand how to use them correctly so that the writing remains coherent.	Knowledge of Cue WordsS	S1-MUCW
R	3. In terms of Contextual Meaning, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*Contextual meaning is **the meaning of a word or sentence according to its context, not its literal meaning. The challenge is that it can be hard to catch the implied meaning of a text,** especially if the language is academic or figurative.*	Inability to Implied Meaning	S1-IIM
R	4. What makes you find it challenging while doing Critical Writing in terms of Contextual Meaning? Explain!		

S-1	*The challenge is when **distinguishing the meaning of the same word used in different contexts.** One must be sensitive to the context so the analysis is not mistaken.*	Unfamiliarity with Different Context	S1-UDCS
R	5. In terms of Truth, what do you now about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*In critical writing, I understand how to distinguish **between fact and opinion** so that my arguments are reliable.*	Knowledge of Logical Fact	S1-KLFS
R	6. What makes you find it challenging while doing Critical Writing in terms of Truth? Explain!		
S-1	*some arguments may **look true at first, but by checking the sources carefully, I** can identify whether the data is strong and trustworthy.*	Knowledge of True Meaning	S1-KTM
R	7. In terms of Validity, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*Validity in critical writing means ensuring that **arguments are on target, relevant, and have a clear basis, not just random claims. According to research X (2022),** caffeine content can increase focus and concentration. Therefore, the habit of drinking coffee can affect academic achievement."*	Knowledge of Valid Premise	S1-KVP
R	8. What makes you find it challenging while doing Critical Writing in terms of Validity? Explain!		
S-1	*I understand how to check the consistency of logic in my own writing to make sure **the argument is valid and accountable.***	Knowledge of Valid Arguments	S1-KVA
R	9. In terms of Soundness, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*Soundness is **the condition when an argument is both valid and based on true premises.** I understand that this requires the premises to be **factual and trustworthy.***	Knowledge Fact and Premise	S1-KFP
R	10. What makes you find it challenging while doing Critical Writing in terms of Soundness? Explain!		

S-1	*I understand that soundness involves both **the truth of the premises and the validity of the logic,** so both must be considered together.*	Knowledge Premise and Logic	S1-KPL
R	11. In terms of the Application of a general rule, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*This is the **application of a general rule to a specific case. The challenge is that a general rule does not always fit perfectly when applied to real-life cases.***	Inability to Use Application of a General Rule	S1-IUAGR
R	12. What makes you find it challenging while doing Critical Writing in terms of the Application of a general rule? Explain!		
S-1	*The challenge is in **choosing a general rule that is relevant to the case.** If the wrong rule is chosen, the argument may become weak.*	Unfamiliarity with Relevant Arguments.	S1-UAGR
R	13. In terms of Model Ponens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*Model ponens is **a logical pattern:** if A is true, then B is true; A is proven, therefore B is also proven. The challenge is **sometimes constructing clear premises so the conclusion is strong.***	Inability to Use Clear Premises	S1-IUCP
R	14. What makes you find it challenging while doing Critical Writing in terms of Model Ponens? Explain!		
S-1	*It's challenging when **creating premises** that align with reality. If the **premises are inaccurate,** the conclusion will also be wrong.*	Unfamiliarity with Premise	S1-UP
R	15. In terms of Model Tollens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*Modus tollens is **a logical pattern:** if A then B; but B does not occur, therefore A is also false. The challenge is that it can **be tricky to ensure that "B" truly does not occur**.*	Inability to Use Logical Arguments	S1-IULA
R	16. What makes you find it challenging while doing Critical Writing in terms of Model Tollens? Explain!		
S-1	*The challenge is **when proving the absence of something,** because it requires more **detailed arguments** and stronger evidence.*	Unfamiliarity with Detailed Arguments	S1-UDA
R	17. In terms of Disjunctive Syllogism, what do you know about it? And what		

	challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*This is a **logical pattern** with options: A or B; if A is false, then B must be true. The challenge is that sometimes there are **more than just two options, which can make the logic misleading.***	Inability to Use More Arguments	S1-IUMA
R	18. What makes you find it challenging while doing Critical Writing in terms of Disjunctive Syllogism? Explain!		
S-1	*It's challenging to make sure that **the choices are really only two. If there are actually other options, the argument collapses.***	Unfamiliarity with Logical Arguments	S1-ULA
R	19. In terms of Identifying a thesis, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*Identifying a thesis means **finding the writer's main statement or central idea.** The challenge is that sometimes the **thesis statement is hidden and not explicit.***	Inability to Use Thesis Statement	S1-IUTS
R	20. What makes you find it challenging while doing Critical Writing in terms Identifying a thesis? Explain!		
S-1	*The challenge is that I often need **to read the entire text first to grasp the thesis. If I only read a part of it, I might misinterpret it.***	Unfamiliarity with Sources of Thesis	S1-UST
R	21. In terms of Conducting Research, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*In my opinion, conducting research is the process of **collecting data or information to be used as the basis for writing.** Usually, this is done by reading journals, articles, or other credible sources. The challenge in critical writing is finding sources that are truly relevant and trustworthy. Sometimes I also **get confused about how to connect the research findings with the arguments I make,** so that the writing becomes critical instead of just a summary.*	Inability to Connect Premise to Arguments	S1-ICPA
R	22. What makes you find it challenging while doing Critical Writing in terms of Conducting Research? Explain!		
S-1	*What I find challenging is when I have to **select and filter through a huge amount of data.** Sometimes I already find many sources, but not all of them can be directly used. I need to be critical in **choosing which ones fit the topic, and***	Inability to Use Relevant Topic	S1-IURT

	how to integrate them into my writing so everything connects well. *This requires strong analytical skills and focus.*		
R	23. In terms of Evaluating Sources, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*Evaluating sources means checking whether the sources used are* ***credible, up-to-date, and relevant to the topic.*** *The challenge is that sometimes I find it hard to* ***distinguish between truly academic sources and ones that are just opinions.*** *Especially since the internet is full of information with unclear validity, it forces me to be extra careful.*	Inability to Use Academic Sources	S1-IUAS
R	24. What makes you find it challenging while doing Critical Writing in terms of Evaluating Sources? Explain!		
S-1	*The challenging part is when I have to critically check the quality of the sources. Sometimes* ***I find an article that looks interesting, but it turns out to be unreliable because it has no scientific basis. That means I have to start searching all over again. Besides that, I often feel confused about how to combine multiple sources in a way that strengthens my argument, instead of making my writing just a collection of quotations.***	Unfamiliarity with Strong Arguments	S1-USA
R	25. In terms of Organizing Ideas, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-1	*In my opinion, is* ***the process of arranging ideas so that the writing is more structured and easy to understand. So, scattered ideas need to be organized into well-structured paragraphs.*** *The challenge is that* ***sometimes I have many ideas but don't know how to place them properly in the writing.*** *As a result, my writing often jumps around and lacks focus.*	Inability to Construct Ideas	S1-ICS
R	26. What makes you find it challenging while doing Critical Writing in terms of Organizing Ideas? Explain!		
S-1	*What* ***I find challenging is connecting one idea to another****. Sometimes* ***I feel like the ideas are already good, but the transitions are not smooth. This can make the reader confused.*** *Besides that,* ***it's also challenging to create an outline that really fits my argument so that it***	Unfamiliarity with Inference of Arguments	S1-UIA

	doesn't drift too far from the main topic.		

Participant Student 2 (AR)

Date: 26 September 2025

Time: 15.00-16.00

Place: Classroom

Student's & Researcher Code	Statement (Raw Data)	Preliminary Code	Final Code
R	1. In terms of Cue Words, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-2	*Cue words are words or phrases that indicate that a **reason is being given to support a conclusion** or that a conclusion is being stated based on a particular reason. choosing the right cue word makes arguments clear and avoids repetition.*	Knowledge of Signal Words	S2-KSW
R	2. What makes you find it challenging while doing Critical Writing in terms of Cue Words? Explain!		
S-2	*The choice of cue word must **match the context so that the argument remains strong and connected.***	Knowledge of Signal Words	S2-KSW
R	3. In terms of Contextual Meaning, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-2	*Contextual meaning is the **meaning of words** that are influenced by the context of a particular sentence or situation. The challenge is to **understand the difference in the meaning of the word in a formal or academic context** so that it is not wrong interpretation when writing.*	Inability to Implied Meaning	S2-IIM
R	4. What makes you find it challenging while doing Critical Writing in terms of Contextual Meaning? Explain!		
S-2	*The challenge is when one word has **many meanings**, so I need to think more critically to adjust it to the **argument so it is not ambiguous.***	Unfamiliarity with Different Context	S2-UDC
R	5. In terms of Truth, what do you now about it? And what challenges do you encounter related to it in Critical Writing? Explain!		

S-2	*Truth is the first requirement in* ***Assessing Whether an argument is valid or not.*** *If the premises used in the* ***argument are factually true and can be proven with valid data or evidence, then those premises meet the criteria of truth****. premises are true if they are* ***factually provable with valid data or evidence.***	Knowledge of Logical Fact	S2-KLF
R	6. What makes you find it challenging while doing Critical Writing in terms of Truth? Explain!		
S-2	*I have no challenge because reliable and* ***accurate evidence strengthens arguments, especially in complex topics.***	Knowledge of True Meaning	S2-KTM
R	7. In terms of Validity, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-2	*An argument is valid only if it is impossible for the reasoning to be true but the conclusion to be false. The challenge is If it is* ***possible for the reasoning to be true but the conclusion to be false, then the argument is invalid. valid arguments are consistent and supported by correct premises.***	Inability to Use Premise	S2-IUP
R	8. What makes you find it challenging while doing Critical Writing in terms of Validity? Explain!		
S-2	*I have challenge of how* ***to ensure that my argument avoids logical fallacies*** *so it remains strong and accountable.*	Inability of Valid Arguments	S2-IVA
R	9. In terms of Soundness, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-2	*Logical force is a key concept used when evaluating arguments. The argument is logically structured in such a way that if the* ***premises are true, the Conclusion must also be true. All Premises are factually true in the real world. Strength validity true premises.*** *The challenge is to keep all the* ***premises that are used correctly and the argument remains valid.***	Inability to Use Fact and Premise	S2-IUFP
R	10. What makes you find it challenging while doing Critical Writing in terms of Soundness? Explain!		
S-2	*The challenges that arise when they have* ***to ensure that all premises are true, not only make sense but also according to facts.***	Unfamiliarity with Premise and Logic	S2-UPL
R	11. In terms of the Application of a general rule, what do you know about		

	it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-2	*Application of a general rule is the application of general rules into special cases. T**he right rule makes the argument relevant.***	Knowledge of Application of a General Rule	S2-KAGR
R	12. What makes you find it challenging while doing Critical Writing in terms of the Application of a general rule? Explain!		
S-2	*I understand how to distinguish **which rules can be applied generally and which cannot,** depending on the context.*	Knowledge of Relevant Arguments.	S2-KGR
R	13. In terms of Model Ponens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-2	*Ponens mode is the logic pattern: if A is correct, then B is true; A Right, so B is right. Reasoning requires a valid first premise to make a strong conclusion.*	Knowledge of Clear Premises	S2-KCP
R	14. What makes you find it challenging while doing Critical Writing in terms of Model Ponens? Explain!		
S-2	*The challenge is when **I have to prove the truth of the initial premise.** If the premise is weak, the conclusion is also not strong.*	Unfamiliarity with Premise	S2-UP
R	15. In terms of Model Tollens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-2	*Tollens mode is a pattern of logic: if A is correct, then B is true; B is wrong, then A is wrong. This reasoning **depends on identifying the correct causal relationship.***	Knowledge of Logical Arguments	S2-KLA
R	16. What makes you find it challenging while doing Critical Writing in terms of Model Tollens? Explain!		
S-2	*Modus tollens **works when the premise is valid and clearly** shows why the conclusion logically follows.*	Knowledge of Detailed Arguments	S2-KDA
R	17. In terms of Disjunctive Syllogism, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-2	*Disjunctive Syllogism is a form of logical reasoning with the choice of "A or B", then rejects one of them to conclude the other. The challenge in critical writing is when **I have to make** **sure the two** **choices of argument and***	Inability to Use More Arguments	S2-IUMA

	premise are really opposite and not ambiguous.		
R	18. What makes you find it challenging while doing Critical Writing in terms of Disjunctive Syllogism? Explain!		
S-2	*What makes me challenged is **when I have to explain the argument with two choices that negate each other.** I have to be careful that my reasoning is not trapped in ambiguity or choice that is actually invalid.*	Unfamiliarity with Logical Arguments	S2-ULA
R	19. In terms of Identifying a thesis, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-2	*Identifying a Thesis is the ability to find the **main statement or the main idea of a text or writing.** The challenge is to distinguish between the main ideas and supporting ideas, as well as ensuring that the thesis chosen really represents the core of the argument. In critical writing, **this is challenging because often the main idea is hidden or not conveyed explicitly***	Inability to Use Thesis Statement	S2-IUTS
R	20. What makes you find it challenging while doing Critical Writing in terms Identifying a thesis? Explain!		
S-2	*I feel challenged because I have to **read carefully and critically so as not to misunderstand the author's intentions**. If I identify thesis, then all the analyzes that I do can be inappropriate.*	Unfamiliarity with Sources of Thesis	S2-UST
R	21. In terms of Conducting Research, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-2	*Conducting Research is the process of finding, gathering, and analyzing relevant **information to support arguments and how to select valid and trustworthy sources** in accordance with the topic.*	Knowledge of Connect Premise to Arguments	S2-KCPA
R	22. What makes you find it challenging while doing Critical Writing in terms of Conducting Research? Explain!		
S-2	*So far, I have been able to be selective in **choosing credible sources and connect the research findings with my arguments logically.***	Knowledge of Relevant Topic	S2-KRT
R	23. In terms of Evaluating Sources, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		

S-2	*Evaluating Sources aims to assess whether a source of information is trustworthy, relevant, and of high quality. I understand how to distinguish* ***credible academic sources*** *from biased or invalid ones and* ***determine a logical argument.***	Knowledge of Academic Sources	S2-KAS
R	24. What makes you find it challenging while doing Critical Writing in terms of Evaluating Sources? Explain!		
S-2	*I have to critically* ***analyze the validity of arguments, the credibility of authors, and the quality of evidence*** *so that my writing is based on strong sources.*	Knowledge of Strong Arguments	S2-KSA
R	25. In terms of Organizing Ideas, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-2	*Organizing Ideas is the ability to arrange ideas regularly, logically, and systematically so that* ***writing is easily understood. maintain consistency and ensure that each idea supports*** *the main thesis.*	Knowledge Construct Ideas	S2-KCS
R	26. What makes you find it challenging while doing Critical Writing in terms of Organizing Ideas? Explain!		
S-2	*While writing critically, I select the most relevant ideas, arrange them clearly, and connect them smoothly so that the writing remains focused and structured.*	Knowledge of Inference of Arguments	S2-KIA

Participant Student 3 (ZA)

Date: 26 September 2025

Time: 15.00-16.00

Place: Classroom

Student's & Researcher Code	Statement (Raw Data)	Preliminary Code	Final Code
R	1. In terms of Cue Words, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*Cue words are* ***linking words or phrases that show relationships between ideas, such as however, therefore, in contrast.*** *The right cue word to avoid misinterpretation.*	Knowledge of Signal Words	S3-KSW

R	2. What makes you find it challenging while doing Critical Writing in terms of Cue Words? Explain!		
S-3	*I understand **between similar words (e.g., however vs. although) so the sentence remains clear.** I often used them in my writing practice.*	Knowledge of Signal Words	S3-KSW
R	3. In terms of Contextual Meaning, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*Contextual meaning refers to the meaning of a word depending on the situation or text. The challenge is **interpreting words accurately when they have multiple meanings.***	Inability to Implied Meaning	S3-IIM
R	4. What makes you find it challenging while doing Critical Writing in terms of Contextual Meaning? Explain!		
S-3	*I find it difficult to match the right meaning with the context, especially with academic vocabulary.*	Unfamiliarity with Different Context	S3-UDC
R	5. In terms of Truth, what do you now about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*Truth refers to statements that are **factually correct and supported by evidence.** I know how to distinguish between fact and opinion.*	Knowledge of Logical Fact	S3-KLF
R	6. What makes you find it challenging while doing Critical Writing in terms of Truth? Explain!		
S-3	*I realize the importance of verifying **the accuracy of information before using it in writing.***	Knowledge of True Meaning	S3-KTM
R	7. In terms of Validity, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*Validity refers to the logical strength of an argument or research result. The challenge is ensuring that arguments are based on reliable evidence.*	Inability to Use Premise	S3-IUP
R	8. What makes you find it challenging while doing Critical Writing in terms of Validity? Explain!		

S-3	*I find it difficult to test whether my reasoning is valid and free from bias.*	Unfamiliarity with Valid Arguments	S3-UVA
R	9. In terms of Soundness, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*Soundness means that an argument is both valid and true. The challenge is making sure both conditions are fulfilled.*	Inability to Use Fact and Premise	S3-IUFP
R	10. What makes you find it challenging while doing Critical Writing in terms of Soundness? Explain!		
S-3	*Sometimes my argument is valid but lacks truthful evidence, so it is not sound.*	Unfamiliarity with Premise and Logic	S3-UPL
R	11. In terms of the Application of a general rule, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*Application of a general rule means* ***applying a general principle to a specific case. I apply my argument carefully*** *to avoid overgeneralization.*	Knowledge of Application of a General Rule	S3-KAGR
R	12. What makes you find it challenging while doing Critical Writing in terms of the Application of a general rule? Explain!		
S-3	*I try to match a general rule correctly with the given situation. Therefore my* ***argument will be well directed***	Knowledge Relevant Arguments.	S3-KRA
R	13. In terms of Model Ponens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*In critical writing, modus ponens is used to confirm an argument. For example,* ***if the initial premise (P) is true, then the conclusion (Q) is also true. I learned to use it to construct coherent arguments.***	Knowledge of Clear Premises	S3-KCP
R	14. What makes you find it challenging while doing Critical Writing in terms of Model Ponens? Explain!		
S-3	*I understand that modus ponens is the reasoning that if P then Q; P is true, then Q is true. In writing, I use it* ***to strengthen previous arguments.***	Knowledge of Premise	S3-KP
R	15. In terms of Model Tollens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		

S-3	*Modus tollens is a logic l form: If P then Q; Q is false; therefore P is false. It is used to* ***refute an argument or test its validity.***	Knowledge of Logical Arguments	S3-KLA
R	16. What makes you find it challenging while doing Critical Writing in terms of Model Tollens? Explain!		
S-3	*I learned about modus tollens from other logical forms so my reasoning remains strong.*	Knowledge of Detailed Arguments	S3-KDA
R	17. In terms of Disjunctive Syllogism, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*It is reasoning based on "either…or". Example: Either A or B; not A; therefore B. The challenge is* ***recognizing hidden assumptions.***	Inability to Use More Arguments	S3-IUMA
R	18. What makes you find it challenging while doing Critical Writing in terms of Disjunctive Syllogism? Explain!		
S-3	*I sometimes use it incorrectly when both* ***options are not truly exclusive.***	Unfamiliarity with Logical Arguments	S3-ULA
R	19. In terms of Identifying a thesis, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*Identifying a thesis means finding the main idea or claim of a text. The challenge is that* ***sometimes the thesis is implied, not stated directly.***	Inability to Use Thesis Statement	S3-IUTS
R	20. What makes you find it challenging while doing Critical Writing in terms Identifying a thesis? Explain!		
S-3	*I often feel confused about how to select the most relevant* ***parts of a source to support my thesis.***	Unfamiliarity with Sources of Thesis	S3-UST
R	21. In terms of Conducting Research, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*Conducting research means collecting and analyzing data to support arguments. I learned how to find* ***credible and relevant sources.***	Knowledge of Connect Premise to Arguments	S3-KCPA
R	22. What makes you find it challenging while doing Critical Writing in terms of Conducting Research? Explain!		
S-3	*I understand that* ***using updated and reliable sources strengthens*** *my writing.*	Knowledge of Relevant Topic	S3-KRT

R	23. In terms of Evaluating Sources, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*It means checking whether a source is credible, reliable, and relevant. I understand how to distinguish* ***trustworthy academic sources from biased ones.***	Knowledge of Academic Sources	S3-KAS
R	24. What makes you find it challenging while doing Critical Writing in terms of Evaluating Sources? Explain!		
S-3	*I have to* ***critically evaluate online sources to ensure they are reliable,*** *even if they look professional.*	Knowledge of Strong Arguments	S3-KSA
R	25. In terms of Organizing Ideas, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-3	*Organizing ideas means arranging thoughts logically in writing. I can* ***connect ideas smoothly so the writing is clear.***	Knowledge of Construct Ideas	S3-KCS
R	26. What makes you find it challenging while doing Critical Writing in terms of Organizing Ideas? Explain!		
S-3	*I create outlines that help structure* ***my essay and keep it focused.***	Knowledge of Inference of Arguments	S3-KIA

Participant Student 4 (ZR)

Date: 26 September 2025

Time: 15.00-16.00

Place: Classroom

Student's & Researcher Code	Statement (Raw Data)	Preliminary Code	Final Code
R	1. In terms of Cue Words, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*Cue words are words that function as markers or signals to indicate the meaning of a word or text. The challenge is that sometimes* ***we choose the wrong cue words for the text and***	Inability to Use Signal Words	S4-IUSW

	***get the meaning wrong**, and I'm afraid there is excessive use of cue words in every sentence.*		
R	2. What makes you find it challenging while doing Critical Writing in terms of Cue Words? Explain!		
S-4	*Because as far as I know, cue words are used in constructing or evaluating arguments, so the challenge is **how to use cue words in the right context, in a balanced and varied way,** so that the argument appears strong and not monotonous.*	Inability to Use Signal Words	S4-IUCW
R	3. In terms of Contextual Meaning, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*The meaning of a word can be understood if I first look at the context (the situation or sentence in which it is used). If I don't look at the context, it is very difficult for me to understand. The challenge is **to understand, choose, and use the right words so that there are no errors in analysis and the argument is not misinterpreted.***	Inability to Implied Meaning	S4-IIM
R	4. What makes you find it challenging while doing Critical Writing in terms of Contextual Meaning? Explain!		
S-4	*It's the same as before, more or less, how we can understand, choose, and use the right words so that there are no errors in analysis and the argument is not misinterpreted, because contextual meaning is like one word having many meanings, **because contextual meaning in daily activities and academic language is different, so if we misinterpret it, it can make our analysis wrong or inaccurate.***	Unfamiliarity with Different Context	S4-UDC
R	5. In terms of Truth, what do you now about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*Truth in critical writing means truth that can be justified **logically and factually. Truth must be supported by evidence,** come from valid sources, and be presented objectively without bias **so that the argument is strong and accountable.***	Knowledge of Logical Fact	S4-KLF

R	6. What makes you find it challenging while doing Critical Writing in terms of Truth? Explain!		
S-4	*I understand that truth in critical writing* ***means choosing valid truths, distinguishing facts from opinions, and presenting them objectively with clear and logical arguments*** *so that the writing can be accounted for.*	Knowledge of True Meaning	S4-KTM
R	7. In terms of Validity, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*Validity is* ***the soundness of the logic within an argument.*** *The challenge is that* ***sometimes my arguments seem reasonable, but they are actually not valid because the premises are wrong or disconnected.***	Inability to Use Premise	S4-IUP
R	8. What makes you find it challenging while doing Critical Writing in terms of Validity? Explain!		
S-4	*Feeling challenged in writing critically about validity is* ***how to choose evidence that is correct, relevant, and logical,*** *while keeping my arguments free from personal bias so that they remain academically accountable.*	Unfamiliarity with Valid Arguments	S4-UVA
R	9. In terms of Soundness, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*(Soundness) is like the quality of an argument that is logically valid and whose* ***premises are factually correct.*** *So, a valid argument is not necessarily sound, according to Miss Hanna. Validity follows the premises with logic, but if it is sound, it is definitely valid and the premises are also correct. The challenge is how I able to check* ***facts, avoid fallacies, be able to sort through reliable or accurate sources,*** *and be able to balance logic and evidence.*	Inability to Use Fact and Premise	S4-IUFP
R	10. What makes you find it challenging while doing Critical Writing in terms of Soundness? Explain!		
S-4	*Sometimes I feel like there is data or I see statements that seem convincing, but after further examination and research, it turns out that they are not entirely true or are outdated. Determining* ***whether the premise is true is a big challenge in my opinion.***	Unfamiliarity with Premise and Logic	S4-UPL

R	11. In terms of the Application of a general rule, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*It's **like applying general rules to specific cases, like there's a big (general) rule → then I apply it to smaller (specific)** examples. It's like thinking from the general to the specific. I understand that applying a general rule means applying it to a specific situation, so I can see if it actually applies in that particular situation. In this way**, I learn to distinguish when a rule applies and when it doesn't.***	Knowledge of the Application of a General Rule	S4-KAGR
R	12. What makes you find it challenging while doing Critical Writing in terms of the Application of a general rule? Explain!		
S-4	*My challenge is more or less in terms of the application of a general rule, which is **how to ensure that the general rules used are correct, relevant, contextually appropriate**, and can be supported by strong evidence, so that when applied to specific cases, my arguments remain strong and logical*	Inability of Relevant Arguments.	S4-UAGR
R	13. In terms of Model Ponens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*Modus ponens is the simplest form of deductive logical reasoning.* *The basic pattern is:If A, then B.A is true.Therefore, B is true.* *Example:If it rains, then the streets will be wet. It is raining.Therefore, the streets are wet. The challenge is to **construct valid premises and find relevant evidence.***	Inability to Use Clear Premises	S4-IUCP
R	14. What makes you find it challenging while doing Critical Writing in terms of Model Ponens? Explain!		
S-4	*What challenges me when writing critically using modus ponens is the difficulty of **constructing truly valid premises, providing strong evidence, and avoiding logical errors.***	Inability to Use Clear Premises	S4-IUCP
R	15. In terms of Model Tollens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*Model tollens is a form of deductive logical reasoning. The pattern is: If A,*	Inability of Logical Arguments	S4-ILA

	then B. Not B. Therefore, not A. ***If a condition causes a certain result, and that result does not occur, then the initial condition is also not true.*** *Therefore, it is likely that they did not study diligently. The challenge is* ***making sure the logic really matches reality.***		
R	16. What makes you find it challenging while doing Critical Writing in terms of Model Tollens? Explain!		
S-4	*What challenges me in critical writing related to modus tollens is how to write* ***premises clearly, provide sufficient evidence, avoid logical errors, and still present arguments in language*** *that is easy for readers to understand.*	Inability of Logical Arguments	S4-ILA
R	17. In terms of Disjunctive Syllogism, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*It is a form of logical reasoning that uses the statement "or." The principle is: if there are two choices, and one of them is proven wrong, then the other choice is automatically correct. The challenge is that it is sometimes* ***difficult to find relevant examples that fit certain patterns.***	Inability to Use More Arguments	S4-IUMA
R	18. What makes you find it challenging while doing Critical Writing in terms of Disjunctive Syllogism? Explain!		
S-4	*The challenge is that it is difficult to find relevant examples in my critical writing that fit certain patterns, and it is* ***difficult to choose which ones are relevant.***	Unfamiliarity with Logical Arguments	S4-ULA
R	19. In terms of Identifying a thesis, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*Identifying a thesis means finding or determining the main idea/main argument that will be the focus of a critical writing. Thesis: Social media has a negative impact on teenagers' concentration in learning because it increases distraction.*	Knowledge of Thesis Statement	S4-KTS
R	20. What makes you find it challenging while doing Critical Writing in terms Identifying a thesis? Explain!		
S-4	*The challenge is that I find it difficult to* ***determine the right and appropriate***	Unfamiliarity with Sources of Thesis	S4-UST

	main ideas and to keep the thesis balanced		
R	21. In terms of Conducting Research, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*That means conducting research and searching for information to obtain data, evidence, or theories that we can use for our writing, such as choosing which ones are relevant and credible. The challenge is that sometimes it is difficult to* ***find sources or data, such as running out of sources and feeling confused, and finding reliable and accurate sources.***	Inability to Connect Premise to Arguments	S4-ICPA
R	22. What makes you find it challenging while doing Critical Writing in terms of Conducting Research? Explain!		
S-4	*In my opinion, is avoiding plagiarism and filtering out information that seems excessive. Finally, I sometimes have difficulty understanding* ***complex academic readings or topic.***	Inability to Use Relevant Topic	S4-IURT
R	23. In terms of Evaluating Sources, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*Evaluating sources is like a process of rechecking or assessing the quality of sources before using them in writing. The goal is to ensure that they are reliable, relevant, accurate, and up to date, not sources that can be considered old or outdated. The challenge is that I have difficulty* ***determining the right source for my writing.***	Inability to Use Academic Sources	S4-IUAS
R	24. What makes you find it challenging while doing Critical Writing in terms of Evaluating Sources? Explain!		
S-4	*In my opinion, the challenge in evaluating sources lies in how we can assess the credibility of the sources we use, whether they are reliable or accurate, and so on. The challenge is in* ***determining the authenticity of the data.***	Unfamiliarity with Strong Arguments	S4-USA
R	25. In terms of Organizing Ideas, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-4	*Organizing Ideas is the ability to arrange, organize, and connect ideas in a piece of writing. The challenge is*	Inability to Construct Ideas	ICS-S4

	determining which ideas are relevant and which should only be additional.		
R	26. What makes you find it challenging while doing Critical Writing in terms of Organizing Ideas? Explain!		
S-4	*That is, sometimes I have so many ideas in my head, but I have to choose which ideas should be the main ones (the ones that are truly relevant)* ***and which ones should just be additional.*** *And sometimes there are times when I have difficulty* ***organizing my ideas because I don't fully understand the context.***	Unfamiliarity with Inference of Arguments	UIA-S4

Participant Student 5 (MA)

Date: 26 September 2025

Time: 15.00-16.00

Place: Classroom

Student's & Researcher Code	Statement (Raw Data)	Preliminary Code	Final Code
R	1. In terms of Cue Words, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*Cue words are connectors that* ***show the relationship between ideas, such as nevertheless, thus, and on the other hand.*** *In critical writing, I need to select the most suitable point or idea so that the argument remains clear and avoids confusion.*	Knowledge of Signal Words	KSW-S5
R	2. What makes you find it challenging while doing Critical Writing in terms of Cue Words? Explain!		
S-5	*I need to distinguish between words with* ***similar meanings (like however and although)*** *so that my writing stays clear and coherent.*	Knowledge of Signal Words	W-S5
R	3. In terms of Contextual Meaning, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*Contextual meaning is the meaning of a word depending on its use in a text or situation. The challenge is to interpret*	Inability to Implied Meaning	IIM-S5

	correctly when a word has several possible meanings.		
R	4. What makes you find it challenging while doing Critical Writing in terms of Contextual Meaning? Explain!		
S-5	*I often struggle to identify* ***the correct sense of a word in academic texts.***	Unfamiliarity with Different Context	UDC-S5
R	5. In terms of Truth, what do you now about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*Truth means information or statements that are* ***factually accurate and supported by proof.*** *It is* ***telling facts apart from opinions.***	Knowledge of Logical Fact	KLF-S5
R	6. What makes you find it challenging while doing Critical Writing in terms of Truth? Explain!		
S-5	*I have to make sure the information is* ***accurate before I use it in writing.***	Knowledge of True Meaning	KTM-S5
R	7. In terms of Validity, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*Validity is the logical strength of an argument or research result. The challenge is* ***making sure the evidence used is strong and reliable. Because I feel confused if the premise is not clear.***	Inability to Use Premise	IUP-S5
R	8. What makes you find it challenging while doing Critical Writing in terms of Validity? Explain!		
S-5	*I sometimes find it hard to test whether* ***my reasoning is valid and unbiased.***	Unfamiliarity with Valid Arguments	UVA-S5
R	9. In terms of Soundness, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*Soundness means an argument is both logically valid and based on truth. The challenge* ***is ensuring both conditions are satisfied****.*	Inability to Use Fact and Premise	IUFP-S5
R	10. What makes you find it challenging while doing Critical Writing in terms of Soundness? Explain!		
S-5	*At times,* ***my argument is logically valid but lacks factual support,*** *making it unsound.*	Unfamiliarity with Premise and Logic	UPL-S5

R	11. In terms of the Application of a general rule, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*This refers to applying a general principle to a particular case. The difficulty* ***is avoiding excessive generalization.***	Inability to Use Application of a General Rule	IUAGR-S5
R	12. What makes you find it challenging while doing Critical Writing in terms of the Application of a general rule? Explain!		
S-5	*I often face problems* ***matching the right rule to the given context.***	Unfamiliarity with Relevant Arguments.	UAGR-S5
R	13. In terms of Model Ponens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*Modus ponens is a logical pattern: If P then Q; P is true; therefore Q must also be true. The challenge is* ***being able to identify it in reading materials.***	Inability to Use Clear Premises	IUCP-S5
R	14. What makes you find it challenging while doing Critical Writing in terms of Model Ponens? Explain!		
S-5	*Sometimes* ***I forget to check whether the condition (P) is indeed true before accepting the result.***	Inability to Use Clear Premises	IUCP-S5
R	15. In terms of Model Tollens, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*Modus tollens follows this pattern: If P then Q; Q is false; therefore P must be false. The challenge* ***is applying it correctly in reasoning.***	Inability to Use Logical Arguments	IULA-S5
R	16. What makes you find it challenging while doing Critical Writing in terms of Model Tollens? Explain!		
S-5	*I sometimes* ***mix up modus tollens with other reasoning forms, which weakens my argument.***	Inability to Use Logical Arguments	IULA-S5
R	17. In terms of Disjunctive Syllogism, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*It is reasoning with "either…or". Example: Either A or B; not A; so B. The*	Inability to Use More Arguments	IUMA-S5

	*challenge is **detecting hidden assumptions in such reasoning.***		
R	18. What makes you find it challenging while doing Critical Writing in terms of Disjunctive Syllogism? Explain!		
S-5	*I sometimes misuse it **when the two options are not mutually exclusive.***	Unfamiliarity with Logical Arguments	ULA-S5
R	19. In terms of Identifying a thesis, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*To identify a thesis is to find the main claim or central idea of a text. The challenge is **when the thesis is implied rather than stated.***	Inability to Use Thesis Statement	IUTS-S5
R	20. What makes you find it challenging while doing Critical Writing in terms Identifying a thesis? Explain!		
S-5	*I find it challenging when **the text is lengthy and full of supporting information.***	Unfamiliarity with Sources of Thesis	UST-S5
R	21. In terms of Conducting Research, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*Conducting research involves gathering and analyzing information to back up arguments. The challenge is **locating trustworthy and relevant sources.***	Inability to Connect Premise to Arguments	ICPA-S5
R	22. What makes you find it challenging while doing Critical Writing in terms of Conducting Research? Explain!		
S-5	*I sometimes depend on **weak or outdated references, which affects the quality of my work.***	Inability to Use Relevant Topic	IURT-S5
R	23. In terms of Evaluating Sources, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*This means checking if a source is reliable, credible, and relevant. The difficulty **is separating trustworthy sources from biased ones.***	Inability to Use Academic Sources	IUAS-S5
R	24. What makes you find it challenging while doing Critical Writing in terms of Evaluating Sources? Explain!		
S-5	*It is difficult for me to **judge online materials since many look professional but are not reliable.***	Unfamiliarity with Strong Arguments	USA-S5

R	25. In terms of Organizing Ideas, what do you know about it? And what challenges do you encounter related to it in Critical Writing? Explain!		
S-5	*Organizing ideas means arranging thoughts in a logical way when writing. The difficulty is* ***ensuring smooth transitions between ideas.***	Inability to Construct Ideas	ICS-S5
R	26. What makes you find it challenging while doing Critical Writing in terms of Organizing Ideas? Explain!		
S-5	*I often fail to make* ***a clear outline before writing, which results in a less organized essay.***	Unfamiliarity with Inference of Arguments	UIA-S5

APPENDIX VI

Student's Thematizing and Coding Result

Chaffee (2010)

No	Aspects	Theme/ Indicator	Code	Total
1.	Recognizing Arguments		RA	
		1. Cue Words	CW	
		• Inability to Use Signal Words	CW-IUSW	
		• Unfamiliarity of Using Cue Word	CW-UUCW	
		2. Contextual Meaning	CM	
		• Inability to Implied Meaning	CM-IIM	5
		• Unfamiliar with Different Context	CM-UDC	5
2.	Evaluating Arguments		EA	
		1. Truth	T	
		• Inability to Use Logical Fact	T-IULF	
		• Unfamiliar with True Meaning	T-UTM	
		2. Validity	V	
		• Inability to Use Premise	V-IUP	5
		• Unfamiliarity with Valid Arguments	V-UVA	5
		3. Soundness	S	
		• Inablity to Use Fact and Premise	S-IUFP	5
		• Unfamiliarity with Premis and Logic	S-UPL	5
3.	Understanding Deductive Arguments		UDA	
		1. Application of a General Rule	AGR	
		• Inability to Use AGR	AGR-IUAGR	2
			AGR-URA	2

		• **Unfamiliarity with Relevant Arguments** **2. Model Ponens** • **Inability to Use Clear Premise** • **Unfamiliarity with Premise** **3. Model Tollens** • **Inability to Use Logical Arguments** • **Unfamiliarity with Detailed Arguments** **4. Disjunctive Syllogism** • **Inability to Use More Arguments** • **Unfamiliarity with Logical Arguments**	**MP** **MP-IUCP** **MP-UP** **MT** **MT-IULA** **MT-UDA** **DS**	**2** **2** **3**
4.	**Constructing Extended Arguments**	**1. Identifying a Thesis** • **Inability to Use Thesis Statement** • **Unfamiliarity with Sources Thesis** **2. Conducting Research** • **Inability to Connect Premise to Arguments** • **Inability to Use Relevant Topic** **3. Evaluating Sources** • **Inability to Use Academic Sources** • **Unfamiliarity with Strong Arguments** **4. Organizing Ideas** • **Inability to Construct Ideas** • **Unfamiliarity with Inference of Arguments**	**CEA** **IT** **IT-IUT** **IT-UST** **CR** **CR-ICPA** **CR-IURT** **ES** **ES-IUAS** **ES-USA** **OG** **OG-ICI** **OG-UIA**	**5** **5** **3** **3** **3** **3** **3**

The documentation of students' semi-structured interviews

No	The students' documentation essay
1.	**Student 1 (IM)** Critical Writing **The Impact of Generative AI on Students' Cognitive and Affective Domain** **Generative AI Impact on Critical Thingking : Revisting Bloom's Taxonomy** **Introduction** The development of generative AI technology, particularly ChatGPT, has had a significant impact on how students develop critical thinking skills in higher education. On the one hand, AI helps simplify complex concepts and increases learning engagement. However, on the other hand, excessive reliance on AI has the potential to undermine students' intellectual autonomy. In this context, it is important to review traditional learning approaches, such as Bloom's Taxonomy, to be more responsive to the cognitive and affective needs of AI-assisted learning environments. A study by Gonsalves (2024) shows that the use of AI affects not only the cognitive domain but also the affective domain, such as emotional engagement and collaboration, which are crucial for the quality of students' critical thinking. **Body** **Constructing extended argument** First,the use of AI such as ChatGPT has proven effective in helping students understand difficult concepts in a simpler and more contextual way. For example, students in Gonsalves' (2024) study stated that ChatGPT helped them understand the term "Halo of Capital" in simpler terms, allowing them to apply it in the context of a technology startup. Second,Furthermore, AI also functions as a collaborative partner in learning, triggering affective aspects such as motivation and self-confidence when students are able to "dialogue" with AI to answer complex questions.The premise: the use of AI in education will only be effective if students maintain active engagement in the critical thinking process. Third, Without active cognitive engagement, students tend to use AI passively, merely as a tool for finding instant answers. Therefore, it is important to strike a balance between the use of technology and the development of independent reflection in the learning process. **Deductive argument** First,students who actively use AI demonstrate developed cognitive abilities, particularly when validating the information provided by ChatGPT. Second,For example, they do not immediately accept the AI's answers at face value, but instead conduct further research in journals or scientific articles to ensure the accuracy of the data. A premise from: Gonsalves' (2024) journal states that the use of AI can improve students' critical thinking skills if accompanied by reflective engagement and

	adaptive learning strategies (p. 3). Third,in addition to the cognitive dimension, the affective dimension is also evident in students' ethical attitude for example, they are careful not to copy directly from the AI and choose to adapt answers to their own style to maintain academic integrity. Some students even consciously position the AI as a discussion partner rather than simply a search engine.Conclusion deductive: The positive influence of AI on critical thinking can only be achieved if students combine analytical evaluation with ethical and reflective awareness in the learning process. Conclusion Overall, AI like ChatGPT has great potential to support the learning process in higher education, particularly in developing critical thinking skills. However, this effectiveness depends heavily on how actively students engage in processing, evaluating, and integrating the information provided by AI. An approach that combines cognitive skills such as analysis and evaluation, as well as affective dimensions such as collaboration, ethics, and motivation, will result in more comprehensive and reflective learning. Therefore, educators and policymakers need to design learning strategies that not only facilitate access to AI but also foster an awareness of values based critical thinking, autonomy, and academic responsibility. Referensi Gonsalves, C. (2024). Generative AI's Impact on Critical Thinking: Revisiting Bloom's Taxonomy. Journal of Marketing Education, 1–16. https://doi.org/10.1177/02734753241305980
2.	**Student 2 (AR)** Critical Writing **The Impact of Generative AI on Students' Cognitive and Affective Domain** **Introduction:** Generative artificial intelligence (generative artificial intelligence/genai) has become one of the most significant technological innovations in the world of higher education. Tools such as chatgpt began to be widely used in higher education institutions (Higher Education Institutions/Heis) because of their ability to produce responses such as humans, compile text, to help in the learning process. Although the use of genai brings many benefits, such as supporting cognitive thinking skills - including critical thinking, creative, reflective, computational, and problem solving - on the other hand also raises concerns about academic integrity, excessive dependence, and declineQuality of students' independent thinking. Given the importance of thinking skills in the world of work today, this study focuses on the positive and negative impacts of the use of genai on the cognitive thinking skills of students and academics in the higher education environment, with the aim of providing insight and guidelines inThe application of genai effectively and ethically in the context of learning. **Body:** **Constructing Extended Arguments and Deductive Arguments**

	In my opinion, there are as highly important reasons why we should be careful consider the integration of generative artificial intelligence (genai), such as chatgpt, in higher education. First, I argue that the use of chatgpt can enrich students' learning experience through prompt engineering that encourages deeper analysis and evaluation from various perspectives. However, this benefit can only be achieved if students continue to think independently than relying solely on the ai-generated responses (Essel et al., 2023). Second, chatgpt used as a guidance-based learning AID (GCLA), as highlighted by Lee et al. (2023), has been shown to foster creative thinking. Since it offers prompts instal intead of direct Answers, it gives students space to think independently, explore ideas, and develop innovative solutions. Third, Altogh Genai Offers Quick Access to Information and Instant Answers, ITS Uncontrolled Use Without Critical Reflection May Weaken Students' Cognitive Autonomy. Moongela et al. (2025) Warned that Students' Might Become Passive Learners Who Accept Information Without Verification or Analysis. Likewise, the use of genai in academic settings must be approached wisely. While it has the potential to support the development of higher-order thinking skills, it is also carries risk that may have a critical and reflective thinking if missed. Therefor, Rather than Replace the Human Thinking Process, Genai Should Serve as a Supportive Tool to Enhance Cognitive Engagement and Creativity Among Students. However, the use of gen-ai in education has both opportunities and challenges. According to the findings mentioned in the text, genai brings both positive and negative impact on cognitive thinking skills. **Conclusion:** In Conclusion The use of generative artificial intelligence (genai) such as chatgpt in the higher education environment has a dual impact - both positive and negative - to the cognitive thinking skills of students. On the one hand, genai can improve the ability to think critically, creatively, and reflectively if used appropriately, such as through a prompt that encourages in -depth analysis and exploration of ideas. On the other hand, uncontrolled use and without digital literacy and academic ethics can reduce student thinking autonomy and encourage dependence on technology. Therefore, the genai must be positioned as a supporting tool that supports, not replacing, the process of human thinking. A wise, critical, and ethical approach is very necessary so that the use of genai can truly enrich the learning process and develop students' cognitive skills optimally. **Reference:** **Moongela, H., Matthee, M., Turpin, M., van der Merwe, A. (2025). The Effect of Generative Artificial Intelligence on Cognitive Thinking Skills in HEls: SLR**
3.	**Student 3 (DA)** Critical Writing **The Impact of Generative AI on Students' Cognitive and Affective Domain**

	In the era of globalization, the development of artificial intelligence (AI) has had a significant impact on the field of education, including the emergence of generative AI. Generative AI refers to a technology capable of producing text, images, or audio based on previously learned data. In the context of learning, generative AI is increasingly being utilized to create more interactive and personalized teaching and learning experiences. One of the most notable impacts of this technology can be observed in the cognitive and affective domains of students. Many students report greater engagement when learning with responsive and innovative AI tools. However, the implementation of generative AI requires supervision and guidance from educators to prevent potential misuse by students.
4.	**Student 4 (ZR)** Critical Writing **The Impact of Generative AI on Students' Cognitive and Affective Domain** One significant advancement in educational technology is the impact of generative artificial intelligence (Generative AI) on students' cognitive and affective domains. As a tool capable of producing human-like content and interactions, generative AI affects not only how students absorb and retain information but also their emotional and motivational states. Given that educational institutions are increasingly integrating AI technologies into their learning processes, I believe it is imperative to understand these effects. While the affective domain includes motivation, feelings, and attitudes, the cognitive domain involves mental abilities such as reasoning, memory, and problem-solving. Using an approach that involves constructing, recognizing, and evaluating arguments about the benefits and challenges of AI in education, I contend that the use of generative AI requires a thorough critical review of its dual impact on both domains. I agree with Chen and Zhou's (2024) assertion that generative AI can enhance students' cognitive engagement by providing tailored and adaptive learning experiences that strengthen memory and problem-solving abilities. In my opinion, constructing extended arguments is a crucial step in critically writing about the impact of generative AI. Based on this premise, I argue that generative AI not only facilitates more effective mastery of content but also fosters creativity and active engagement in the learning process. Furthermore, I believe this argument should be expanded to consider how AI can improve student motivation and reduce anxiety through personalized learning experiences and empathetic responses, both of which positively affect the affective domain. Writing deductive arguments is, in my view, also an appropriate strategy. This method starts with a general principle, such as the need for increased engagement and reduced anxiety in education, and logically concludes that generative AI meets these needs through mechanisms like adaptive feedback and emotion

	recognition. Deductive arguments, I believe, are strongest when based on clear premises specifically, that AI effectively personalizes and adapts learning that are supported by evidence and logically organized to reach a sound conclusion. In conclusion, I believe that generative AI significantly influences learning outcomes in both cognitive and affective aspects, going far beyond merely serving as a tool for delivering information. I firmly believe that scholars and educators can conduct a balanced and critical evaluation of AI's role by employing deductive argumentation and evidence-based argument construction, such as the fundamental premise of AI's role in personalizing and adapting the learning process. Such evaluations should address concerns about cognitive overload and the potential decline in critical thinking skills while also recognizing AI's capacity to boost motivation and creativity. In my opinion, continuous assessment through rigorous construction, recognition, and evaluation of arguments is essential to ensure that AI's application in education develops responsibly and creates learning environments that support both intellectual growth and emotional well-being. REFERENCE Lang, J. C. (2024). Embracing generative AI for authentic learning. *Creative Education*, 15(1), 1–20. https://doi.org/10.4236/ce.2024.151001
5.	Student 5 MA Critical Writing **The Impact of Generative AI on Students' Cognitive and Affective Domain** **Introduction** Generative AI tools, such as ChatGPT, have become increasingly prevalent in educational settings, transforming the ways in which students learn and engage with material. These technologies offer significant advantages—such as personalized support, increased engagement, and enhanced creativity. However, concerns have also emerged, particularly about their impact on cognitive processes like critical thinking and memory, as well as on affective elements such as motivation and emotional development. This complexity suggests that while AI has the potential to be a beneficial tool in education, its influence on both cognitive and affective domains must be critically examined. **Body** **Constructing extended arguments** When constructing extended arguments, students can engage in multi-step reasoning with the aid of generative AI. However, studies have shown that overdependence on AI can lead to weakened critical thinking and poor judgment, especially when students rely uncritically on AI-generated answers. On the other hand, when AI is integrated effectively—alongside guidance and scaffolding from educators—it can improve students' cognitive performance. In particular, research has found that constructive

	interaction with AI systems can increase motivation and build self-efficacy. **Deductive Arguments** Furthermore, deductive reasoning tasks reveal deeper cognitive implications of AI use. A brainwave study conducted by MIT indicated that students who used ChatGPT for writing exhibited reduced brain activity, resulting in unoriginal and formulaic output. This lack of mental engagement persisted even when the students were later asked to write independently. Despite this, the affective outcomes can be more positive; some learners report a boost in confidence and creativity when using AI-generated ideas as inspiration rather than final answers. These contrasting findings illustrate the need for a balanced and reflective approach to AI use in learning. **Conclusion** In conclusion, generative AI has a multifaceted impact on students' learning, influencing both how they think and how they feel. While it can undermine independent reasoning and memory when misused, it can also enhance creativity, motivation, and self-belief when implemented with intention and care. Educators must play an active role in guiding students toward responsible AI use, ensuring that technology enhances rather than replaces cognitive and emotional development. **References** ● C. Zhai et al. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities (time.com, slejournal.springeropen.com) ● N. Kosmyna / MIT Media Lab (2025). EEG study on ChatGPT users' neural engagement (time.com) ● Yun Bai & Shaofeng Wang (2025). Impact of generative AI interaction on motivation and self-efficacy (nature.com) ● Afnan Wasif (2025). FT student perspective on AI bolstering analytical thinking (ft.com)



