Makerere  University

Examining the role of Problem-based Learning in Enhancing Critical Thinking Skills among Graduate Students at Gulu University

By

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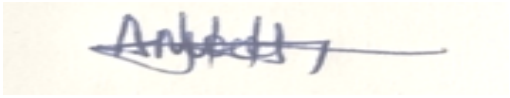
Declaration

I, Gloria Lamaro, declare that this dissertation titled "Examining the Role of Problem-based Learning in Enhancing Critical Thinking Skills among Graduate Students at Gulu University" is my original work; and has not been submitted to any Higher Education Institution for any award whatsoever.



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Approval

This dissertation titled: "Examining the Role of Problem-based Learning in Enhancing Critical Thinking Skills among Graduate Students at Gulu University" is submitted with our approval.

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Dedication

This work is dedicated to my family for their unwavering support and encouragement throughout this journey. To my parents whose belief in the power of education inspired me to pursue my dreams. To my spouse, whose patience, understanding, and love have been my steadfast anchor. And to my children, who have been my source of motivation and joy. Additionally, I dedicate this work to my mentors and teachers, whose guidance and wisdom have profoundly influenced my academic and personal growth. Finally, to the students and faculty of Gulu University whose dedication to learning and teaching inspired this study. Thank you all for being my constant source of inspiration and strength.

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Abstract

This study aimed to examine the role of problem-based learning (PBL) components specifically case scenarios, academic collaborations, and guided facilitation in enhancing critical thinking skills among graduate students at Gulu University. Grounded in critical theory and informed by Habermas's critical inquiry, the research employed a qualitative design. Data were collected through semi-structured interviews, focus group interview, and document checks involving graduate students, recent graduates, and lecturers. The research sought to answer the following questions: (i) How do case scenarios nurture critical thinking skills among graduate students? (ii) How do academic collaborations foster critical thinking skills among graduate students? (iii) How does guided facilitation promote critical thinking skills among graduate students? Data were analysed using inductive thematic analysis to identify key themes and insights. The findings revealed that integrating case scenarios into the curriculum significantly enhanced students' critical thinking by bridging theoretical knowledge with practical problem-solving. Case scenarios allowed students to engage with real-world issues, apply classroom concepts to tangible situations, and strengthen their analytical and problem-solving abilities. Academic collaborations, including group projects, peer reviews, and cooperative research, were found to enrich critical thinking by exposing students to diverse perspectives, facilitating reflective dialogue, and promoting cooperative problem-solving. Guided facilitation provided crucial support through structured questioning, feedback, and mentoring, which helped students refine their reasoning processes and maintain focus on learning objectives. The study concluded that while the PBL components were effective in enhancing critical thinking skills, their full potential was constrained by insufficient diversity in case scenarios, unequal access to technology, and ongoing logistical challenges. The study recommended that policymakers and implementers focus on integrating culturally diverse and contextually relevant case scenarios, ensuring equitable access to technological resources, and addressing logistical barriers. Additionally, it advocated for educational reforms aligned with critical theory, aiming to address systemic inequalities and promote social justice. Future research was recommended to include longitudinal studies to assess the impact of these PBL components across various disciplines and contexts. Such studies would provide valuable insights into optimizing PBL and related pedagogical approaches, helping to establish best practices for developing critical thinking skills and creating more inclusive and effective educational frameworks.

Chapter One

Introduction

1.0 Introduction

In the dynamic landscape of higher education, the cultivation of critical thinking skills among graduate students is a cornerstone for both intellectual growth and professional development. Critical thinking is not merely an academic prerequisite; it is an essential asset for engaging in innovative research, solving complex problems, and exercising impactful leadership (Brookfield, 2017). As the challenges of the 21st century become increasingly complex and interconnected, higher education institutions should equip students with the ability to think critically and independently (Halpern et al., 2020)

This chapter set the stage for an in-depth examination of PBL's role in enhancing critical thinking at Gulu University. By examining the background, statement of the problem, purpose, objectives, research questions, scope, and significance of the study, this research aimed to provide valuable insights into how higher education could better prepare students for the complexities of the modern world.

1.1 Background to the Study

The background to this study is structured into four key perspectives: historical, theoretical, conceptual, and contextual. Each perspective provides a comprehensive understanding of the study's foundation and relevance.

1.1.1 Historical Perspective

Critical thinking, which is central to intellectual inquiry and problem-solving, has evolved through distinct traditions in both Western and African thought systems. These traditions have shaped our current understanding of reasoning, decision-making, and the

application of critical thought in educational and societal contexts. The historical contributions of Western and African philosophers, while rich and influential, also contain certain limitations that need to be considered in the contemporary pursuit of critical thinking. Understanding both the relevance and weaknesses of these contributions is essential, particularly when exploring the role of Problem-Based Learning (PBL) at institutions like Gulu University.

The Western tradition of critical thinking began in ancient Greece, with (Hanscomb, 2023) forming the foundational framework for reasoning, logic, and inquiry.

Socrates: His Socratic Method emphasized questioning assumptions through dialectical dialogue to stimulate critical reflection (Altorf, 2019). This approach remains relevant today in promoting open dialogue and the challenging of preconceived notions, especially in democratic societies and educational contexts. However, Socrates' method is often critiqued for being more concerned with abstract ideals than practical solutions, which can limit its applicability in real-world problem-solving.

Plato: Through his dialogues, Plato advanced the idea of reason as a tool for exploring the nature of knowledge and ethics (Plato, 1962). His focus on rational inquiry laid the groundwork for Western philosophy. The emphasis on ideal forms, however, can be seen as overly abstract and disconnected from lived experiences, which may present challenges when addressing complex, real-world issues in a concrete manner.

Aristotle: Known for formalizing logic in works like the "Organon", Aristotle created the foundation for deductive reasoning (Aristotle, 1894). His logical systems are central to modern disciplines such as mathematics, law, and science. Yet, Aristotle's rigid classification of logic and reason, while groundbreaking, is criticized for not fully incorporating emotional or ethical considerations, thus narrowing the scope of human experience in decision-making.

During the medieval period, Thomas Aquinas integrated Aristotelian logic with theological inquiry, which helped shape critical thought in both religious and secular domains (Pieper, 2011). His work is crucial for understanding the relationship between faith and reason but can be seen as reinforcing traditional power structures, especially in terms of authority within the Church.

In the Scientific Revolution, philosophers like René Descartes and Francis Bacon expanded critical thinking through the scientific method (Bacon et al., 2018). Descartes' skepticism and Bacon's emphasis on empirical observation changed how knowledge was pursued. However, Descartes' overemphasis on doubt can lead to paralyzing skepticism, and Bacon's empiricism sometimes ignores the more abstract and theoretical dimensions of knowledge.

The Enlightenment philosophers, including John Locke, Voltaire, and Immanuel Kant, promoted reason and skepticism in challenging existing social and political systems (Copleston, 2003). They laid the intellectual foundations for modern democracy and human rights. However, their focus on individualism and rationality sometimes disregarded social and emotional aspects of human experience, which can lead to an overly mechanistic view of human society and governance.

In the 20th century, John Dewey shifted educational philosophy to emphasize experiential learning and Problem-Based Learning (PBL) (Dewey, 1974). Dewey's ideas are still highly relevant in modern educational systems that prioritize critical thinking and student-centered learning. However, his focus on practical, problem-solving may sometimes overlook the deeper philosophical and moral dimensions that shape our decisions, especially in complex global contexts.

In contrast to the Western tradition, African philosophy has deeply rooted approaches to critical thinking that prioritize communal wisdom, relational ethics, and interconnectedness.

Ubuntu: This African philosophy, as articulated by Thaddeus Metz and Kwasi Wiredu, emphasizes the importance of community and relationality in critical thinking (Eze & Metz, 2016). The communal approach to problem-solving encourages mutual respect and collective wisdom, which is highly relevant in addressing contemporary social and ethical issues. However, the potential weakness of Ubuntu is that its emphasis on communal harmony may sometimes suppress dissenting opinions or individual autonomy, which can limit the diversity of thought and critical engagement.

Indigenous Knowledge Systems: John S. Mbiti documented the rich oral traditions, proverbs, and communal debates that served as vehicles for critical reflection in pre-colonial Africa (Mbiti, 2015). These practices are highly relevant in recognizing the value of collective intelligence. However, these oral traditions, while rich in cultural context, are often overlooked in formal academic discourse, and their lack of written records poses challenges in preserving and integrating these insights into modern education systems.

In post-colonial Uganda, philosophers such as Okot p'Bitek and Mahmood Mamdani addressed the impact of colonialism on African identity and political systems (Mamdani, 2005) (p'Bitek, 2020) . Their critical analysis of colonialism's effects on African governance and social structures remains crucial today in understanding issues of identity and post-colonial political philosophy. However, these critiques can sometimes focus so heavily on the colonial past that they neglect the dynamic, forward-looking aspects of African intellectual development.

Ngũgĩ wa Thiong'o and other contemporary scholars continue to highlight the need to reclaim African cultural heritage, integrating it into modern educational systems (Wa Thiong'o,

1998). While this process is essential in maintaining cultural relevance, it often faces the challenge of reconciling indigenous knowledge with globalized educational systems, which may not always value such knowledge or may fail to understand it in its proper context.

In contemporary Uganda, educational reforms aim to integrate indigenous knowledge with modern pedagogical practices, reflecting the evolving landscape of critical thinking. The Problem-Based Learning (PBL) approach is being increasingly adopted at institutions such as Gulu University, which fosters collaborative, hands-on problem-solving and critical thinking among students. PBL helps bridge the gap between Western and African traditions by encouraging students to draw from both indigenous wisdom and modern scientific inquiry. However, integrating these knowledge systems remains a challenge, as there is still a tendency to prioritize Western models of education, potentially marginalizing African ways of knowing.

The historical development of critical thinking in both Western and African traditions provide rich insights into the evolution of reasoning, problem-solving, and intellectual inquiry. Western philosophers such as Socrates, Plato, and Aristotle have laid the foundation for modern critical thinking, but their focus on individualism and rationality sometimes neglects the emotional, social, and cultural dimensions of human experience. On the other hand, African philosophies like Ubuntu and indigenous knowledge systems emphasize communal wisdom and relational ethics, offering valuable perspectives on critical thinking, though they may face challenges of integration into formal academic frameworks.

The contemporary emphasis on Problem-Based Learning (PBL) in Uganda offers a unique opportunity to synthesize these diverse traditions of critical thinking. By addressing the weaknesses in both Western and African philosophical approaches such as the limited focus on emotion and culture in Western thought and the underrepresentation of African intellectual

traditions in global discourse PBL can provide a more holistic, contextually relevant approach to education.

1.1.2 Theoretical Perspective

This study explored how Problem-Based Learning (PBL) can enhance critical thinking skills among graduate students, using Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001) as the theoretical framework. Bloom's Revised Taxonomy categorizes cognitive processes into six hierarchical levels Remember, Understand, Apply, Analyze, Evaluate, and Create with the higher levels specifically related to critical thinking skills (Wilson, 2016a). The taxonomy provides a structured approach to assess how students' progress through various cognitive stages, moving from basic recall to complex reasoning and problem-solving. The study specifically focuses on how PBL, which inherently promotes active learning and real-world problem-solving, engages students at these different cognitive levels to foster the development of critical thinking.

Remembering and Understanding: The first two levels of Bloom's taxonomy, Remember and Understand, are foundational to the development of critical thinking. In PBL, students must recall prior knowledge and concepts related to the problem they are solving. This level is essential as it lays the groundwork for engaging with more complex tasks. For example, a graduate student tasked with solving a case study related to their field must first recall theoretical concepts before they can understand the implications of those concepts in the context of the problem. This aligns with the Remember and Understand levels of Bloom's taxonomy, ensuring that students have a firm grasp of existing knowledge before progressing to higher-order thinking tasks. Through PBL, these initial stages help build the necessary cognitive structure for critical thinking by allowing students to explain, interpret, and integrate their prior knowledge.

Applying and Analyzing: The Apply and Analyze levels of Bloom's taxonomy are central to the development of critical thinking. PBL emphasizes the application of knowledge to real-world problems, which requires students to adapt their existing knowledge to new contexts. This process of Application moves students beyond rote learning and encourages them to test theories and solutions in real-world scenarios, pushing them to engage in higher-order cognitive functions. Furthermore, PBL tasks require students to Analyze the problems at hand identifying components, breaking down complex issues, and exploring various perspectives. In a PBL setting, students engage in critical thinking by analyzing the problem's components, questioning assumptions, and identifying underlying issues. These processes are integral to deepening critical thinking, as they require students to evaluate how different elements of the problem interconnect and influence one another. Bloom's taxonomy, therefore, provides the lens to understand how PBL fosters these analytical skills.

Evaluating and Creating: At the Evaluate and Create levels, critical thinking reaches its peak. Bloom's Revised Taxonomy stresses the importance of Evaluation and Creation for higher-order cognitive development. PBL tasks naturally involve evaluating potential solutions and strategies based on evidence, feasibility, and effectiveness. Students are required to weigh the pros and cons of different solutions, assess their validity, and justify their decisions. This critical engagement at the Evaluate level enhances the ability to make informed judgments and reasoned decisions. Similarly, the Create level of Bloom's taxonomy involves synthesizing information to generate innovative and novel solutions, a process that is inherently critical as it challenges students to think outside the box and develop original ideas. Through PBL, students are encouraged to integrate diverse viewpoints, theories, and solutions to create new frameworks or solutions for the problems they encounter. This final stage promotes critical thinking by

stimulating students to go beyond what is known and apply their knowledge in creative, problem-solving contexts.

In summary, Bloom's Revised Taxonomy underpins this study by providing a clear framework to assess how PBL facilitates the development of critical thinking at each level of cognitive engagement. From foundational knowledge recall (Remembering) to complex problem-solving and creation (Creating), Bloom's taxonomy helps frame how students' progress through these stages in PBL and how each stage contributes to enhancing their critical thinking abilities. By aligning PBL with Bloom's taxonomy, this study demonstrates how PBL's real-world, problem-solving approach supports the development of higher-order cognitive processes and critical thinking skills among graduate students.

1.1.3 Conceptual Perspective

The study employed a number of concepts ranging from PBL to critical thinking skills.

1.1.3.1 Problem-based Learning (PBL). Problem-based learning (PBL) is a pedagogical approach that uses complex, real-world problems as a primary vehicle for student learning. This instructional strategy emphasizes active learning and problem-solving, with students working in collaborative groups to address issues that lack straightforward solutions. The conceptualization of PBL is grounded in constructivist theory, which posits that learners build their understanding through interaction with their environment and active engagement with meaningful problems Savery (2015); and Goldman et al. (2022).

Recent literature for instance Hmelo-Silver et al. (2019), highlights that PBL's core attributes include its student-centered nature and real-world relevance. Savery (2015) defines PBL as a method where students engage with complex problems that are both relevant and challenging, fostering a deeper understanding through inquiry and exploration. This approach

contrasts with traditional didactic methods by shifting the focus from passive reception of knowledge to active problem-solving and critical thinking. (Hmelo-Silver & Chernobilsky, 2012) further argue that PBL's effectiveness lies in its ability to simulate real-world scenarios, which enhances students' practical skills and prepares them for professional environments.

Collaborative learning is another fundamental aspect of PBL. According to Kim, (2014), PBL involves students working in small groups to investigate and solve problems such as poverty, disease, unemployment among others (Kim, 2014). This collaborative approach not only fosters interpersonal skills but also enriches the learning experience by incorporating diverse perspectives and solutions. However, recent studies have pointed out that the dynamics of group work can vary significantly, influencing the overall effectiveness of PBL. (Liu et al., 2023) emphasize that while collaboration is beneficial, the quality of interactions and the roles within the group can impact the outcomes of PBL, highlighting the need for more nuanced research into group dynamics.

Facilitation plays a crucial role in PBL. Zulkifli et al. (2020) highlight that facilitators are essential in guiding students through the problem-solving process, providing scaffolding, and ensuring that students remain focused and engaged. Effective facilitation requires a delicate balance between providing guidance and allowing students the autonomy to explore solutions independently. This underscores the importance of training facilitators to effectively support student learning without overshadowing the problem-solving process.

Assessment in PBL presents unique challenges. Traditional assessment methods may not adequately measure skills developed through PBL, such as problem-solving and critical thinking. Yan and Boud (2021) discuss the need for new assessment frameworks that capture both the process and the outcomes of PBL activities. This gap in the literature indicates a significant area

for development, as effective assessment is crucial for evaluating the impact of PBL on student learning.

Disciplinary variability is another area where PBL research is lacking. While PBL has been extensively studied in fields such as medicine and engineering, its application in other academic disciplines remains under explored. Hung-Lung et al. (2023) points out that PBL's effectiveness can vary depending on the subject matter and the specific nature of the problems used. This suggests a need for more research into how PBL can be adapted and optimized for different fields of study.

Socio-cultural factors also influence PBL outcomes but are not well understood. Johnson et al. (2019) emphasize that socio-cultural contexts can impact students' engagement with PBL, potentially affecting the inclusivity and effectiveness of the approach. Understanding how cultural and social backgrounds influence PBL experiences is essential for ensuring that the method is equitable and addresses diverse student needs.

In this study, PBL is conceptualized as an instructional approach where learners engage with ill-structured, real-world problems in a collaborative setting, guided by facilitators who support and scaffold the learning process (Hmelo-Silver, 2004). The study aims to build on existing literature by exploring the nuances of PBL implementation, including how varying task designs, socio-cultural factors, and assessment methods impact the development of critical thinking skills among graduate students. By addressing the identified gaps such as the need for improved assessment frameworks, understanding disciplinary variability, and examining socio-cultural influences this study seeks to contribute to a more comprehensive understanding of PBL and its effectiveness across different educational contexts.

In conclusion, problem-based learning offers a dynamic and student-centered approach to education that fosters critical thinking and practical skills. However, gaps in the literature regarding assessment, disciplinary application, and socio-cultural influences need to be addressed to fully understand and optimize PBL's impact. This study aims to bridge these gaps, contributing valuable insights into how PBL can be effectively implemented and evaluated in diverse educational settings.

1.1.3.2 Critical Thinking Skills. Critical thinking skills are integral to academic and professional success, encompassing a spectrum of cognitive processes that facilitate informed decision-making and problem-solving. Traditionally, critical thinking has been framed as a reflective and systematic approach to evaluating beliefs and actions (Dewey, 1910) Dewey's seminal work laid the groundwork for understanding critical thinking as an active, deliberate process involving rigorous questioning and reflective judgment.

In contemporary literature, critical thinking is often defined through frameworks that emphasize its practical application and cognitive depth. (Mastuti et al., 2022)provides a nuanced definition, emphasizing critical thinking as a process involving interpretation, analysis, evaluation, and inference. This comprehensive view aligns with Bloom's Revised Taxonomy, which categorizes cognitive processes into levels from basic understanding to advanced evaluation and creation (Wilson, 2016a). The taxonomy underscores the progressive nature of critical thinking, from mere knowledge recall to complex cognitive tasks like synthesis and innovation.

Recent studies like Halpern, Dwyer, Hogan and Stewart have expanded on these foundational definitions by exploring the role of critical thinking in various educational contexts. For instance, Halpern (2014) argues that critical thinking encompasses not only cognitive skills

but also the ability to apply these skills to practical problems, thereby enhancing decision-making outcomes. This view aligns with research by Dwyer et al. (2014), who highlight the importance of integrating critical thinking into instructional practices to foster higher-order cognitive skills. Their work illustrates how effective teaching strategies can enhance students' ability to analyze and evaluate information critically.

Despite these comprehensive definitions, gaps remain in understanding how specific educational interventions, such as Problem-Based Learning (PBL), influence the development of critical thinking skills across different contexts. While existing literature provides general insights into critical thinking (e.g., Halpern (2014), there is a lack of focused research on how instructional methods like PBL impact specific dimensions of critical thinking in diverse academic disciplines and professional settings. Further empirical studies are needed to elucidate how PBL specifically enhances various cognitive processes involved in critical thinking.

Bloom's Taxonomy, initially introduced by Bloom (1956) and later revised by Wilson (2016a), provides a hierarchical framework for categorizing cognitive processes. The taxonomy ranges from basic knowledge acquisition to advanced levels of analysis, evaluation, and creation. This structured approach is instrumental in designing educational activities that promote critical thinking across different levels of cognitive complexity.

Recent research like O’Neill and Murphy has expanded on Bloom’s framework by exploring its application in contemporary educational settings (O'neill, 2015). For example, Mealey (2023) re-evaluate Bloom's Taxonomy to better align with modern educational practices and cognitive research, providing insights into creating assessments that foster higher-order thinking skills. This aligns with the work of Kuhn (2019) who emphasizes the importance of structuring educational tasks to promote critical engagement and complex reasoning. Kuhn's

research highlights that educational activities must be strategically designed to challenge students' cognitive processes and support their development of higher-order thinking skills. Similarly, studies by Yeng Chai (2024) underscore the significance of task design in fostering critical engagement and reasoning, validating the necessity for well-constructed instructional strategies to enhance critical thinking.

Despite the widespread use of Bloom's Taxonomy, there is a need for more detailed research on how specific instructional methods, including problem-based learning (PBL), interact with this framework to foster critical thinking. For instance, research by Wilson (2016b) suggests that while Bloom's Taxonomy provides a useful structure, its practical application often lacks alignment with actual cognitive processes observed in learners. More recent studies, such as those by Pagani (2020) highlight the necessity of exploring how different instructional designs, like PBL, affect various levels of Bloom's Taxonomy and contribute to the development of critical thinking skills.

Effective instructional strategies are crucial for developing critical thinking skills. Recent research highlights that critical thinking encompasses a range of cognitive skills crucial for enhanced decision-making and problem-solving. For instance, Fitriani et al. (2024) emphasizes that critical thinking involves skills such as analysis, evaluation, and inference, which are essential for making reasoned judgments. Similarly, Hasan et al. (2024) underscore the importance of integrating critical thinking into instructional practices to improve student outcomes, suggesting that effective teaching strategies promote deeper cognitive engagement and better decision-making. Research highlights the importance of integrating critical thinking into instructional practices through explicit teaching, problem-solving activities, and formative assessments Poce et al. (2022).These approaches encourage students to engage deeply with content, reflect on their cognitive processes, and apply their skills to complex problems.

Recent studies of Wilton et al. (2024) have explored the contribution of various instructional strategies on critical thinking. For example, Wilton et al. (2024) examine the role of technology and collaborative learning in fostering critical thinking, highlighting the benefits of interactive and participatory learning environments. However, there is a need for more nuanced research on how specific instructional methods, such as PBL, impact different aspects of critical thinking and cognitive development.

A notable gap in the literature is the limited empirical research on how different instructional methods, particularly PBL, affect various dimensions of critical thinking. While studies such as those by Dwyer et al. (2014) and Wilton et al. (2024) provide valuable insights, further research is needed to understand how specific instructional designs influence critical thinking skills across different academic disciplines and educational contexts.

This study adopted a conceptual framework for critical thinking that integrates contemporary definitions and educational practices. Drawing from Fitriani et al. (2024) Revised Taxonomy Wilson (2016a), the study conceptualizes critical thinking as involving higher-order cognitive processes, including analysis, evaluation, and creation. By focusing on PBL as an instructional strategy, the study aims to explore how engaging students in real-world, complex problems can enhance these critical thinking skills.

The study seeks to address gaps identified in the literature by examining how PBL specifically impacts various dimensions of critical thinking. It aims to provide insights into how PBL can be optimized to foster higher-order cognitive skills and how different instructional designs influence critical thinking development. The study also intends to explore how PBL interacts with Bloom’s Taxonomy to enhance specific cognitive processes involved in critical thinking.

In summary, the conceptual perspective on critical thinking skills integrates traditional and contemporary definitions, frameworks, and instructional strategies. By identifying gaps in the current literature, particularly concerning the impact of PBL, this study provides a comprehensive view of how critical thinking can be effectively developed and assessed in educational settings. The findings aim to enhance understanding of how specific educational practices contribute to cultivating critical thinking skills, thereby improving educational outcomes and preparing students for complex problem-solving tasks in academic and professional contexts.

1.1.3.3 Conceptual Framework of the Study. The conceptual framework of this study explores how Problem-Based Learning (PBL) can enhance critical thinking skills among graduate students, particularly through the lens of Habermas's critical theory and his concept of critical inquiry (Scambler, 2001). This perspective emphasizes the role of reflective and communicative processes in fostering deeper understanding and empowerment through education.

At the core of the framework is the use of problem-based techniques, which present students with real-world, ill-structured problems. According to Habermas's theory, knowledge is not just a commodity to be transferred; it is constructed through dialogue and critical reflection. These scenarios encourage students to engage deeply with content, challenge their assumptions, and bridge theoretical knowledge with practical application. Habermas's emphasis on communicative action where participants aim for mutual understanding aligns with the PBL approach of using complex, real-world problems to provoke critical discussion and analysis. This method supports the development of critical thinking as students are encouraged to question, debate, and reflect on different solutions, fostering an environment of critical inquiry.

The framework also emphasizes collaborative processes, where students work together to solve problems. This collaborative approach resonates with Habermas's idea of the "ideal speech situation," where dialogue is free from domination, and all participants have an equal opportunity to contribute. In the PBL context, collaboration allows students to engage in critical discourse, challenge each other's viewpoints, and co-construct knowledge. Habermas's critical theory posits that through such communicative action, individuals can overcome distortions and achieve emancipation here, understood as the ability to think critically and independently. By working collaboratively, students are exposed to diverse perspectives, which help them to develop their critical thinking skills through reflective discourse and mutual understanding.

The third component of the framework involves tutorial methodologies, where instructors act as facilitators rather than providers of solutions. In line with Habermas's notion of critical inquiry, the role of the facilitator is crucial in guiding students to question and reflect on their learning processes. Facilitators encourage students to critically assess the validity of their knowledge, consider multiple perspectives, and engage in self-reflection, which aligns with the goal of achieving "communicative rationality" a state where reasoning is based on dialogue that is free from coercion and focused on understanding.

The selection of this framework is justified by its alignment with Habermas's critical theory, which emphasizes the role of dialogue, reflection, and emancipation in learning. The integration of problem-based techniques, collaborative processes, and guided facilitation creates a robust environment for critical inquiry, where students are not just passive recipients of knowledge but active participants in their learning journey. This approach fosters a more democratic and reflective learning process, where critical thinking skills are developed through the active engagement of students in dialogue and problem-solving.

Habermas's critical inquiry framework was also chosen over other educational approaches for its robust alignment with the study's objectives of fostering critical thinking and addressing societal issues. This framework emphasizes rational discourse and reflective dialogue, which are essential for deepening students' analytical skills and promoting critical engagement (Edgar, 2014) Unlike frameworks that focus primarily on rote learning or direct instruction, Habermas's approach integrates critical examination of power structures, thereby encouraging students to interrogate societal norms and injustices (Edgar, 2014).

The framework's compatibility with Problem-Based Learning (PBL) further enhanced its applicability by combining real-world problem-solving with critical inquiry, thus creating a comprehensive learning environment that supports both cognitive and social development (Savery, 2015); (Goldman et al., 2022). This integration fosters self-directed learning and metacognitive skills, differentiating it from traditional models that may not adequately address these dimensions (Mulaudzi, 2021). Overall, the critical inquiry framework's focus on dialogue, reflection, and social critique provided a transformative educational experience that other frameworks might lack.

In summary, the conceptual framework integrates Habermas's critical theory into the PBL approach by emphasizing the importance of dialogue, collaboration, and reflective facilitation in developing critical thinking skills. Problem-based techniques provide the context for critical inquiry, collaborative processes enhance understanding through dialogue, and guided facilitation supports the development of independent, critical thought. Together, these components create a comprehensive learning strategy that empowers students to think critically, challenge assumptions, and engage deeply with their learning experiences.

1.1.4 Contextual Perspective

Problem-based learning (PBL) has gained widespread recognition for its potential to enhance critical thinking skills, which are essential for success in complex, real-world situations. PBL encourages students to solve authentic problems, promoting active and collaborative learning that applies theoretical knowledge in practical settings (Klamen et al., 2022); (Stitt, 2024). Recent studies continue to validate PBL's effectiveness in developing deep cognitive skills and practical problem-solving abilities (Ssemugenyi, 2023). However, despite its proven benefits, the application of PBL in resource-limited environments, such as Gulu University, remains underexplored.

Gulu University faces significant educational challenges that highlight the limitations of traditional teaching methods. The student population is diverse, with individuals from varying socio-economic and educational backgrounds, resulting in disparities in preparedness and engagement. Many students come from underserved areas with limited access to prior educational opportunities. These challenges are further compounded by the university's limited technological resources and educational materials, creating an environment where traditional instructional methods fall short.

Traditional teaching methods are increasingly inadequate for addressing the critical thinking deficits that are prevalent in resource-constrained environments. Research has shown that conventional approaches, such as lectures, rote memorization, and passive learning, fail to engage students at a deeper level and do not effectively develop the complex problem-solving skills required in today's world (Alt & Raichel, 2022). This gap in traditional teaching methods exacerbates educational inequalities and limits students' ability to tackle real-world problems effectively.

While PBL has been widely researched and proven effective in well-resourced settings, there is a lack of studies focused on its adaptation and impact in resource-limited contexts, such as Gulu University. Most existing research on PBL has been conducted in environments with ample resources and infrastructure (Kek & Huijser, 2016). The adaptation of PBL to fit the constraints of resource-limited institutions is still largely unexplored, particularly in graduate programs, where advanced critical thinking and problem-solving skills are crucial but underdeveloped in the context of PBL (Savin-Baden, 2023).

This study aims to address these gaps by exploring how PBL can enhance critical thinking skills in the unique context of Gulu University. The research will investigate how PBL can be practically modified to overcome the resource limitations and diverse educational backgrounds of the students. The goal is to develop a comprehensive understanding of how PBL can be effectively implemented in such an environment, providing a valuable model for other institutions facing similar challenges.

By focusing on the adaptation and impact of PBL in resource-constrained environments, this study seeks to fill a critical gap in the existing literature. It will also provide actionable insights into overcoming barriers to effective teaching and learning, enabling educators to implement innovative pedagogical approaches that can enhance critical thinking skills in challenging educational contexts.

The implications of this research are significant. If PBL proves to be effective in enhancing critical thinking at Gulu University, it could serve as a model for other institutions in similar resource-limited settings. The findings of this study will offer practical solutions for adapting PBL to fit diverse and constrained educational environments, ultimately improving educational outcomes and addressing critical thinking deficits.

In summary, this study aims to bridge the gap left by traditional teaching methods in addressing critical thinking deficits. By exploring the potential of PBL in resource-constrained environments, this research will contribute to advancing educational practices and fostering critical thinking skills among graduate students in developing regions.

As a staff involved in implementing PBL at Gulu University, I have personally witnessed the limitations of traditional teaching methods and recognized the significant potential of PBL to engage students more effectively. Given the diverse socio-economic backgrounds of our students, it is crucial to explore alternative pedagogical approaches that can foster critical thinking. This study is motivated by a desire to understand how PBL can be adapted to meet the unique needs of our students, providing valuable insights for other institutions facing similar challenges in resource-limited settings.

1.2 Statement of the Problem

Graduate students at Gulu University are expected to demonstrate advanced critical thinking (CT) skills, including the ability to analyze complex materials, formulate well-supported arguments, and apply analytical frameworks effectively (Dwyer & Eigenauer, 2017). However, there is a noticeable gap between the expected and actual performance, with many students facing challenges in engaging deeply with academic texts and producing high-quality research outputs. Despite the adoption of Problem-Based Learning (PBL) to foster these skills, it remains unclear whether PBL has fully succeeded in enhancing students' critical thinking abilities. (Awacorach et al., 2021) suggests that while PBL encourages students to engage with real-world problems and fosters research capacity and employability, its direct impact on critical thinking is not explicitly measured. (Alidri, 2019) further highlights that integrating ICT tools like Moodle into PBL can support problem-solving, collaboration, and innovative thinking. However, further refinements to PBL are needed to better support the development of critical

thinking and improve student outcomes, particularly in terms of deeper engagement with academic content and real-world challenges. This study aims to explore how PBL can be enhanced to more effectively foster critical thinking and address these challenges.

1.3 Purpose of the Study

The purpose of the study was to examine the role of Problem-Based Learning (PBL) in enhancing critical thinking skills among graduate students at Gulu University.

1.4 Research Objectives

This study aimed to:

i. Explore the role of case scenarios in nurturing critical thinking skills among graduate students at Gulu University.

ii. Analyse the role of academic collaborations fostering critical thinking skills among graduate students at Gulu University.

iii. Assess the contribution of guided facilitations in promoting critical thinking skills among graduate students at Gulu University.

1.5 Research Questions

i. How do case scenarios nurture critical thinking skills among graduate students at Gulu University?

ii. How do academic collaborations foster critical thinking skills among graduate students at Gulu University?

iii. How do guided facilitations promote critical thinking skills among graduate students at Gulu University?

1.6 Scope of the Study

The content scope of this study was centered on evaluating the effectiveness of Problem-Based Learning (PBL) in enhancing critical thinking skills among graduate students at Gulu University. This involved an in-depth exploration of how PBL methodologies were applied to address deficiencies in critical thinking. The study focused specifically on various aspects of PBL, including its implementation, effectiveness in fostering analytical skills, and the development of problem-solving abilities. Key components included the design and execution of PBL activities, the assessment of student performance in critical thinking tasks, and the analysis of feedback from both students and faculty. By examining these areas, the study aimed to provide comprehensive insights into the potential of PBL to improve critical thinking skills within the graduate program.

The geographical scope of the study was confined to Gulu University, located in Northern Uganda. Specifically, the university was situated in the Gulu East City Division of Laroo, approximately 320 kilometers (200 miles) by road north of Kampala, Uganda's capital. The university's primary campus coordinates were 2 degrees 47'19.0" N latitude and 32 degrees 19'01" E longitude (Latitude: 2.788620 & Longitude: 32.316946). The study focused geographically on the campus's specific academic environment, particularly within the Department of Educational Planning and Management, Faculty of Education and Humanities, where the PBL approach was introduced in 2015. This localized focus allowed for a detailed examination of PBL's impact in a specific institutional context.

The time scope of the study covered the period from the introduction of PBL at Gulu University in 2015 to the present. This timeframe was essential for assessing both the implementation process and the longitudinal impact of PBL on students' critical thinking skills. The study examined data and feedback collected over this period to evaluate the effectiveness of

PBL interventions and track any changes in student performance and skill development. By focusing on this timeframe, the study aimed to provide a thorough analysis of how PBL had evolved and its effects on graduate education over several academic years.

1.7 Significances of the Study

For policymakers, this study could provide empirical evidence on the effectiveness of Problem-Based Learning (PBL) in enhancing critical thinking skills among graduate students. If the research were to demonstrate a positive impact, it might serve as a basis for considering the integration of PBL into educational policies and curricula. Policymakers could potentially use these findings to advocate for the adoption of PBL strategies at institutional or national levels, possibly influencing educational reforms and setting new standards for pedagogical practices. The study's insights might help shape policy discussions and decisions, potentially contributing to the development of more effective educational frameworks.

Policy implementers could potentially utilize the study's findings to inform the practical application of Problem-Based Learning within educational settings. The research might offer guidance on how to incorporate PBL into existing curricula and teaching methods, address potential challenges, and suggest strategies for successful implementation. By understanding the study's results, implementers could develop targeted training programs for educators, design supportive structures for PBL integration, and adapt the approach to fit specific educational contexts. This practical application could be crucial for translating theoretical insights into actionable strategies that might enhance teaching and learning outcomes.

Future researchers might benefit from this study by using its findings as a foundation for further investigation into Problem-Based Learning. The research could open up several avenues for exploration, such as examining PBL's impact across different educational settings,

disciplines, or populations. Future studies might explore the long-term effects of PBL on student outcomes, its adaptability to various learning environments, and its comparative effectiveness with other pedagogical methods. By building on this study, researchers could potentially deepen the understanding of PBL and contribute to the development of evidence-based practices that might improve educational outcomes and foster critical thinking skills.

1.8 Justifications for the Study

This study on examining the role of problem-based learning (PBL) in enhancing critical thinking skills among graduate students aligns with Uganda's Vision 2040 (Ozor et al.; Sophia & Onen, 2024) and the Third National Development Plan (NDP III) (Moyo & Mamobolo, 2014), which emphasized the importance of developing a skilled workforce to drive economic growth and innovation (Republic of Uganda, 2020). The Sustainable Development Goals (SDGs), particularly Goal 4, highlighted the global focus on fostering critical thinking and problem-solving skills as essential for quality education and lifelong learning (United Nations, 2015). Since the introduction of PBL at Gulu University in 2015, there had been a notable absence of comprehensive studies evaluating its impact on critical thinking among graduate students. This study addressed this gap by employing a qualitative approach to provide in-depth insights from faculty and students, which was crucial for understanding the effectiveness of PBL in this context (Kirabo et al., 2024). Furthermore, while PBL had been successful in fields such as medicine and engineering, its application in non-STEM disciplines like educational management remained underexplored (Loyens, 2019). By focusing on programmes in Educational Management, this research aimed to contribute to the broader understanding of PBL’s benefits and offer practical recommendations for enhancing its implementation in diverse educational settings (Hmelo-Silver et al., 2019).

Chapter Two

Literature Review

2.0 Introduction

This chapter presents a comprehensive review of the related studies, elucidate the current understanding, and identifies gaps in the knowledge concerning problem-based learning (PBL) and critical thinking skills. The primary aim of this literature review is to contextualize the study within existing research, highlight theoretical foundations, and address the empirical evidence related to PBL and its impact on critical thinking. The chapter is systematically divided into three subsections: the review of theories, the review of related literature, and the summary.

2.1 Theoretical Review

Piaget's cognitive constructivism has profoundly influenced the understanding of problem-based learning (PBL) and its impact on critical thinking skills. (Piaget, 1973) argued that cognitive development progresses through active, exploratory learning, where individuals construct knowledge through problem-solving experiences. This theoretical perspective has been extensively applied in educational settings, particularly in medical education. For instance, (Ojok, 2019) demonstrated how PBL involving complex patient cases enhances diagnostic skills and clinical judgment, directly aligning with Piaget's principles of cognitive growth through problem-solving. However, Piaget's stage-based model, which emphasizes distinct developmental stages, has limitations in the context of graduate education. Research by (Dinsmore & Fryer, 2023) revealed that Piaget's model may not fully account for the diverse developmental trajectories of adult learners, leading to variations in engagement with and retention of critical thinking skills. This gap suggests a need for longitudinal studies to evaluate how PBL supports the ongoing development of critical thinking skills across various academic and professional contexts, thus addressing the limitations of Piaget's theory in adult education.

Vygotsky's socio-cultural theory offers significant insights into the collaborative aspects of PBL. His concepts of the zone of pproximal ddevelopment (ZPD) and scaffolding emphasize that learners achieve higher levels of understanding through guided interaction and support (Abune, 2019). In business education, PBL tasks that involve collaborative efforts allow students to leverage diverse perspectives and peer feedback, enhancing their strategic thinking and problem-solving abilities (Alt & Raichel, 2022). Despite these advantages, Vygotsky's framework does not fully address the influence of cultural differences on PBL's effectiveness. Research by (Abudurexiti et al., 2019) highlights that group dynamics and collaborative engagement can vary significantly across different cultural contexts, which impacts the development of critical thinking skills. This limitation points to the need for further exploration into how cultural and individual differences affect PBL outcomes, thereby refining the application of Vygotsky's theory in diverse educational environments.

Bloom's taxonomy, a hierarchical framework for cognitive processes, has been instrumental in structuring PBL tasks to promote higher-order thinking (Wilson, 2016a). The taxonomy supports the design of PBL activities that require students to engage in analysis, synthesis, and evaluation, thus fostering critical thinking. However, Bloom's model has faced criticism for its rigid hierarchical structure, which may oversimplify the complexities of cognitive development (Adhikari, 2024). (Barker, 2023) argue that cognitive processes often occur in a non-linear manner, challenging the utility of Bloom's Taxonomy as a strict framework for assessing critical thinking. This critique highlights the need for more adaptable assessment tools that reflect the dynamic nature of cognitive processes in PBL settings, allowing for a more nuanced understanding of how students develop critical thinking skills.

Kolb's experiential learning ttheory posits that learning is a cyclical process involving concrete experience, reflective observation, abstract conceptualization, and active

experimentation (Kolb, 1984). PBL aligns with Kolb's learning cycle by integrating real-world problems with theoretical knowledge, promoting critical thinking through iterative problem-solving (Harrison & Roodt, 2022). Despite its alignment with PBL, Kolb's model has been critiqued for its oversimplified view of learning processes, which may not fully account for individual differences in learning styles (Vikas & Mathur, 2022). (McKinney et al., 2022) observed that students often engage in reflective observation and active experimentation simultaneously, rather than following Kolb's linear stages. This complexity suggests a need for further research into how different learning styles influence critical thinking development within PBL frameworks, thus refining Kolb's theory to better accommodate diverse learning experiences.

Self-determination ttheory (SDT), developed by (Ryan & Deci, 2020) emphasizes the importance of autonomy, competence, and relatedness in motivating learners. PBL tasks that offer choices and collaborative opportunities align with SDT principles, enhancing intrinsic motivation and critical thinking (Niemann et al., 2019). However, SDT also reveals limitations when excessive autonomy is provided without adequate support. (Vermote et al., 2020) found that too much freedom without sufficient guidance can impede engagement and critical thinking. This suggests the necessity for a balanced approach that integrates autonomy with structured support to optimize PBL's effectiveness in fostering critical thinking skills. Further research is needed to explore how to maintain this balance effectively in PBL settings.

The Community of Inquiry (CoI) model, developed by (Moore & Miller, 2022) focuses on cognitive, social, and teaching presences in online learning environments. This model has been effectively applied to online PBL settings, where regular interactions and structured support enhance cognitive engagement and critical thinking (Moore & Miller, 2022). Despite its effectiveness, challenges persist in maintaining high levels of cognitive and social presence

online. (Meylani, 2024) highlighted that technological limitations and varying levels of student engagement can impact the effectiveness of online PBL. This indicates a need for further research into effective strategies for implementing PBL online to ensure it effectively promotes critical thinking. Understanding how to overcome these challenges will be crucial for optimizing PBL in digital learning environments.

Critical ttheory, as articulated by (Osborne, 2011) and (Adorno, 1991) during the mid-20th century, and further developed by (Habermas et al., 2003) provides a lens for examining how educational practices may reinforce or challenge societal power dynamics and inequalities. This theory emphasizes the role of education in promoting social justice and engaging students in critical reflection on social issues. It suggests that educational methods have the potential to address issues of equity and inclusivity by encouraging students to question and critique existing power structures. However, there are notable gaps in critical ttheory's application. Specifically, it lacks detailed guidance on how educational scenarios can be designed to effectively confront societal inequalities and incorporate diverse cultural perspectives. Additionally, while the theory advocates for critical dialogue and reflection, it does not fully address how these principles can be operationalized in diverse educational settings to ensure equitable outcomes for all students. Further exploration is needed to understand how educational practices can be refined to promote social change and enhance equity, ensuring that they reflect and address a broad spectrum of social and cultural contexts.

This comprehensive review of theoretical foundations illustrates how each theory contributes to understanding the role of PBL in fostering critical thinking. The integration of recent studies and critical engagement with the literature highlights both the strengths and limitations of these theories in the context of graduate education and PBL. Addressing identified

gaps and exploring the interplay between these theoretical perspectives can enhance the design and implementation of PBL to better support critical thinking skills among students.

Nevertheless, this study utilized critical theory to explore these dimensions, aiming to bridge the gaps, critical ttheory was selected for this study on examining the role of pproblem-based learning (PBL) in enhancing critical thinking skills among graduate students due to its unique emphasis on challenging societal power dynamics and promoting social justice. Unlike other theories, such as Piaget's ccognitive cconstructivism or Vygotsky's socio-ccultural ttheory, which primarily focus on cognitive development or social interaction, critical ttheory provides a broader framework for understanding how educational practices can address or perpetuate social inequalities. It aligns with the objectives of the study by emphasizing the importance of engaging students in critical reflection on societal issues and questioning existing power structures, which is essential for fostering critical thinking and inclusivity in education. While theories like Bloom's Taxonomy offer structured approaches to cognitive processes and Kolb's experiential learning theory addresses learning through practical experience, they do not fully address the socio-political dimensions of education. Critical theory, with its focus on equity and social change, thus offers a more comprehensive perspective for investigating how PBL can be leveraged to enhance critical thinking skills while addressing issues of equity and inclusivity (Ridley, 2019)

2.2 Review of Related Literature

2.2.1 Role of case Scenarios in Nurturing Critical Thinking Skills among Graduate Students at Universities

Recent studies for examples, (Masko et al., 2020) have emphasized the pivotal role of case scenarios in enhancing critical thinking skills among graduate students across various disciplines. These scenarios bridged theoretical knowledge with practical application, offering

significant educational benefits. However, their effectiveness varied, with some scenarios revealing limitations that needed addressing. This review delved into the application of case scenarios in various academic fields, highlighting their successes and areas for improvement based on recent literature.

In medical education, case scenarios were employed to replicate real-world clinical challenges, thereby enhancing diagnostic and clinical judgment skills. (Auma & Achieng, 2020) illustrated the effectiveness of intricate case scenarios by using a detailed simulation of a patient presenting with multi-system symptoms. This approach required students to gather comprehensive patient histories and interpret diagnostic tests, which significantly improved their diagnostic accuracy. For example, a scenario involving a patient with ambiguous symptoms and multiple underlying conditions required students to prioritize differential diagnoses and treatment options, fostering a deeper understanding of complex clinical situations. (Jacobs et al., 2022) further supported this by demonstrating how immersive case scenarios, including virtual patient interactions and simulated emergency situations, allowed students to apply theoretical knowledge in real-time. An illustrative case was a high-fidelity simulation of an emergency room scenario where students had to make quick, evidence-based decisions under pressure, mirroring the dynamics of real-life emergencies. Despite these advancements, (Civitillo et al., 2019) identified a critical limitation: many case scenarios lacked cultural diversity. For instance, a case scenario focusing on a diabetic patient in a Western context might not address the specific needs and challenges faced by patients from different cultural or socio-economic backgrounds. (Joshi et al., 2022) echoed this concern, noting that scenarios often did not include global health challenges, such as managing infectious diseases in low-resource settings. Incorporating diverse cultural and socio-economic contexts into scenarios was deemed essential for preparing students to handle a broad range of global health issues effectively.

In legal education, case scenarios were instrumental in developing analytical and argumentative skills. (Wong, 2022) utilized moot court exercises with complex legal case studies to simulate courtroom experiences. For example, students participated in a moot court scenario involving a high-stakes intellectual property dispute, where they had to draft legal briefs and argue before a mock court. This exercise helped students develop critical thinking skills by applying legal theories to complex, real-world issues. (Gakonga, 2022) supported this by showing that structured legal scenarios improved students' ability to construct and evaluate legal arguments. One effective scenario involved analyzing a hypothetical case involving recent changes in data protection laws. Students were required to assess the implications of these laws on digital privacy and develop legal arguments for various stakeholders, thereby enhancing their understanding of contemporary legal issues. However, (Bell & McCunn, 2024) highlighted a significant gap: many legal scenarios were based on outdated precedents. For instance, scenarios often used legal principles established decades ago, neglecting modern issues such as cybercrime and evolving civil rights. (Rogers, 2023) supported this critique, emphasizing that scenarios needed to be updated to reflect current legal challenges, including emerging technologies and data privacy concerns, to better prepare students for real-world legal practice.

In business education, case scenarios simulated real-world business challenges and facilitated the application of theoretical knowledge. (Perez, 2022) found that business case studies involving market entry strategies and competitive dynamics improved students' decision-making and strategic thinking skills. For example, a case study required students to develop a market entry plan for a tech startup entering a new international market. Students analyzed competitive forces, market trends, and consumer behavior to devise a comprehensive strategy, enhancing their ability to apply business theories to practical situations. (Kozachenko et al., 2022) noted that realistic business scenarios, such as crisis management during economic

downturns, helped bridge the gap between theory and practice. An example scenario involved creating a business continuity plan for a company facing a significant economic recession, which required students to address issues like cost management, resource allocation, and strategic adjustments. Some scenarios failed to reflect regional economic conditions or industry-specific challenges. For instance, a global supply chain disruption scenario might not account for regional variations in logistics and trade policies. (Iyer et al., 2022) reinforced this observation, arguing that tailoring scenarios to local market dynamics and industry contexts was crucial for enhancing their educational value. Scenarios should incorporate regional economic factors and industry-specific challenges to provide students with a more accurate and applicable learning experience.

In engineering education, case scenarios were used to teach problem-solving and design thinking through project-based learning. (Mckenzie, 2023) demonstrated that scenarios involving the design of sustainable energy systems, such as developing solar power solutions for off-grid communities, effectively fostered problem-solving skills and creativity. Students worked on projects that integrated technical knowledge with practical constraints, such as budget limitations and resource availability, enhancing their ability to solve complex engineering problems. (W. Zhang et al., 2024) supported this by noting that project-based scenarios, such as designing an earthquake-resistant structure, helped students address real-world challenges. These scenarios required students to consider multiple factors, including material properties, safety standards, and environmental impact, promoting a comprehensive approach to engineering design. Nonetheless, (Chao et al., 2017) identified that some engineering scenarios were overly simplified. For example, scenarios that did not incorporate regulatory requirements or stakeholder considerations might not fully prepare students for the complexities of professional practice. (Smith et al., 2022) emphasized that realistic scenarios should include real-world constraints,

such as compliance with engineering standards and engagement with diverse stakeholders, to better reflect professional engineering challenges.

In public health education, case scenarios addressed health crises and policy-making challenges. (Smith et al., 2022) found that scenarios involving public health emergencies, such as simulated outbreaks of infectious diseases, improved students' abilities to manage crises and develop comprehensive policies. For example, a scenario required students to design a response plan for a hypothetical epidemic, including strategies for resource allocation, public health messaging, and coordination with healthcare providers. (J. T. Walker et al., 2023) corroborated these findings, noting that public health scenarios facilitated critical thinking by simulating complex health challenges. A notable scenario involved managing a public health crisis with limited resources, requiring students to develop innovative solutions for resource distribution and policy implementation. However, (Luo et al., 2024) pointed out that some public health scenarios inadequately addressed social determinants of health. For instance, scenarios often focused solely on medical interventions without considering broader socio-economic factors such as access to healthcare and social inequalities. (Whitman et al., 2022) highlighted the need for scenarios that incorporated social determinants of health to provide a more comprehensive understanding of health issues and develop effective public health strategies.

In education and pedagogy programs, case scenarios were used to develop teaching strategies and manage classroom dynamics. (Bharti, 2023)found that role-playing scenarios, such as managing a classroom with diverse student needs, improved students' teaching skills and problem-solving abilities. For example, role-playing exercises simulated various classroom management issues, such as addressing disruptive behavior and implementing differentiated instruction strategies. (Saucier et al., 2023) supported this by noting that role-playing enhanced students' ability to handle diverse classroom scenarios effectively. An example involved

scenarios that simulated culturally diverse classrooms, helping students develop practical strategies for engaging with students from different backgrounds and addressing various educational needs. However, (Tomlinson, 2017) highlighted challenges in creating scenarios that accurately reflected diverse classroom settings. Kim et al. (2024) further observed that some scenarios failed to capture the complexities of working with students from varied backgrounds, such as students with different learning abilities or cultural perspectives. This gap underscored the need for more representative scenarios that reflected the dynamic nature of real classroom environments and provided students with practical experience in managing diverse educational contexts.

In summary, several critical gaps exist in the application of case scenarios across different disciplines. Key limitations included a ls, several issues must be addressed to maximize their effectiveness. Literature highlights concern such as the lack of cultural diversity in medical scenarios (Joseph et al., 2021), outdated content in legal case studies (Horvath & Brown, 2022), insufficient contextual relevance in business scenarios (Horvath & Brown, 2022), and inadequate consideration of social determinants in public health scenarios (Horvath & Brown, 2022). These limitations underscore the need for continuous updates and inclusivity in case scenario design to better align with the diverse and dynamic needs of students across disciplines. Additionally, engineering scenarios were sometimes overly simplified, and education and pedagogy scenarios often failed to reflect the diverse nature of real classroom environments. Addressing these gaps was crucial for enhancing the effectiveness of case scenarios in fostering critical thinking and preparing graduate students for the complexities of their professional fields. By refining case scenarios to incorporate diverse perspectives, contemporary issues, and realistic constraints, educators could better prepare students for the multifaceted challenges they would encounter in their careers.

2.2.2 The role of Academic Collaborations in Fostering Critical Thinking Skills among Graduate Students at Universities

Recent literature, for examples, Dara and Kesavan (2024) has delved into the various applications of academic collaborations and their impact on enhancing critical thinking skills among graduate students. has delved into the various applications of academic collaborations and their impact on enhancing critical thinking skills among graduate students. This review synthesizes how different forms of academic collaborations ranging from interdisciplinary partnerships to international projects contribute to the development of higher-order cognitive abilities, while also highlighting areas that require further exploration and refinement.

Recent studies for examples Anderson and Brown have underscored the effectiveness of interdisciplinary collaborations in enhancing critical thinking by exposing students to diverse methodologies and perspectives. For instance, Dara and Kesavan (2024) described a project that integrated environmental science with urban planning. This collaboration allowed students to approach urban sustainability from multiple disciplinary angles, facilitating a comprehensive analysis of the problem. By combining perspectives from environmental science and urban planning, students were able to develop a nuanced understanding of sustainability challenges and solutions, thus sharpening their analytical skills. Similarly, A. E. Williams (2023) highlighted an interdisciplinary project in cognitive science and artificial intelligence. This project required students to apply diverse theoretical frameworks to complex cognitive problems. For example, students utilized theories from both cognitive science and AI to design algorithms for better understanding human cognition. This integration of varied methodologies fostered advanced problem-solving skills and encouraged students to think critically about the intersection of these fields. However, Sauvé et al. (2016) identified limitations in their study of an interdisciplinary project merging environmental science with economics. They observed that theoretical models

often failed to incorporate practical constraints, such as economic and regulatory factors. For instance, while students developed models to promote sustainable practices, these models frequently overlooked economic viability and regulatory challenges, resulting in theoretical insights that lacked real-world applicability. This limitation highlighted a significant gap in how interdisciplinary collaborations could better align theoretical research with practical considerations.

Industry collaborations have been reported as instrumental in bridging the gap between theory and practice. S. Xu et al. (2022) detailed a partnership between an engineering department and a technology firm focused on wearable health technologies. Students in this collaboration worked on real-world problems, such as improving the accuracy of health monitoring devices. By applying theoretical knowledge to practical challenges, students enhanced their problem-solving and decision-making skills, gaining firsthand experience in translating research into practical applications. Patel et al. (2024) reinforced this notion by examining industry partnerships in data analytics projects. Their study revealed that working on actual data sets provided by industry partners enabled students to develop advanced analytical skills. For example, students analyzed real-time data from retail businesses to develop predictive models, which honed their abilities to handle complex data and make data-driven decisions. Nevertheless, Chen and Kuo (2024) pointed out challenges related to cultural and contextual mismatches in their study of a policy-making simulation in public administration. They found that the simulation failed to account for regional differences, such as varying local regulations and cultural contexts. This oversight reduced the simulation's effectiveness, highlighting the need for industry partnerships to be more culturally and contextually tailored to enhance critical thinking development.

Technological tools, such as Virtual Reality (VR) and AI-driven simulations, have been highlighted as transformative for critical thinking. Miller, Dane et al. (2024) reported on a VR simulation used in urban planning education, where students interacted with realistic scenarios like redesigning urban spaces to improve sustainability. This immersive experience allowed students to explore and solve complex urban planning issues in a simulated environment, thereby promoting creative problem-solving and critical thinking. Erasmus et al. (2024) found that AI-driven simulations in business strategy courses facilitated the development of advanced analytical skills. For instance, students used AI simulations to test various business strategies in dynamic market conditions, enhancing their ability to analyze and respond to complex decision-making scenarios. Despite these advancements, C. Xu et al. (2022) pointed out significant challenges such as high costs and varying levels of technical proficiency among students. They noted that in a VR-based project in computer science, financial constraints and inconsistent technical skills among students hindered the project's effectiveness. For example, some students struggled with the technical aspects of VR, which limited their ability to fully engage with the technology and benefit from its potential.

Community-based research has been noted for its ability to enhance critical thinking by addressing real-world problems. Jackson et al. (2023) documented a project where graduate students collaborated with local schools to develop educational interventions aimed at improving student literacy. This project allowed students to apply theoretical knowledge in a practical educational setting, thus enhancing their problem-solving skills and critical thinking. Clark et al. (2024) highlighted similar benefits through community-based environmental research projects. In one case, students worked with local environmental groups to address issues like pollution and habitat destruction. This collaboration not only provided practical experience but also deepened students' understanding of the real-world implications of their research. However, Cadenas et al.

(2024) identified challenges when academic objectives conflicted with community needs. For example, they observed that academic research goals focused on general health trends sometimes clashed with specific community health priorities. This misalignment reduced the effectiveness of the research, indicating a need for better integration of academic and community goals to enhance critical thinking outcomes.

Cross-institutional collaborations have been shown to enhance critical thinking by providing diverse perspectives and resources. Matthews et al. (2020) examined a global health project involving multiple universities, where students tackled issues like infectious disease outbreaks. The project exposed students to various research methodologies and cultural viewpoints, enriching their understanding of global health challenges and promoting critical thinking. Huber et al. (2024) similarly noted that cross-institutional collaborations in bioinformatics allowed students to address complex data analysis problems using diverse approaches. For example, students worked with data from different sources and applied various bioinformatics techniques to uncover insights about genetic diseases, enhancing their analytical skills. Nevertheless, Durugbo and Al-Balushi (2023) identified logistical and administrative challenges, such as differing institutional priorities and communication barriers. In one case, a global health project faced delays and miscommunications due to conflicting research agendas and bureaucratic hurdles. These issues impeded students' engagement in critical thinking tasks, emphasizing the need to address logistical and administrative barriers to improve the effectiveness of cross-institutional collaborations.

Online learning platforms have been explored as tools for facilitating academic collaborations and fostering critical thinking. Solovyeva et al. (2023) investigated a virtual platform that enabled students from different disciplines and institutions to collaborate on research projects, such as developing new technologies for remote learning. This platform

facilitated real-time interactions and diverse perspectives, contributing to enhanced critical thinking through cross-disciplinary engagement. Kemp and Brown (2023) also highlighted how online platforms in collaborative research labs enhanced students' critical thinking. For instance, students from different universities worked together on a research project involving climate change mitigation strategies, utilizing the platform to share insights and develop innovative solutions. However, Zhou et al. (2024) identified challenges related to technological limitations and uneven user proficiency. Their study found that inconsistent access to reliable internet and varying digital skills among students affected the effectiveness of online collaborations. For example, some students experienced connectivity issues, which hindered their ability to participate fully in online discussions and collaborative tasks.

Student-led research initiatives have been recognized for promoting critical thinking by allowing students to independently design and conduct research projects. Lewis et al. ; (L. Williams, 2023) described a program in environmental science where students formulated and executed their research questions on topics such as climate change impacts on local ecosystems. This initiative provided students with opportunities to engage in self-directed research, fostering critical thinking through autonomy and hands-on experience. Vallis et al. (2024) demonstrated similar benefits in public policy projects, where students addressed real-world issues like urban planning and social equity. This approach allowed students to develop their analytical skills and apply theoretical knowledge to practical problems, enhancing their critical thinking. However, Smith et al. (2020) noted challenges related to insufficient guidance and resources. They found that a lack of mentorship and limited access to resources led to incomplete or poorly conducted research. For example, students struggling with limited access to research tools and guidance from faculty mentors faced difficulties in producing high-quality research, highlighting the need for adequate support and resources to ensure the success of student-led research initiatives.

Collaborative grant proposals involving multiple researchers or institutions have been reported to enhance critical thinking through complex project design and coordination. Patel et al. (2022) discussed a successful grant proposal process for a longitudinal health study involving several universities. This process required critical analysis of research design and methodology, contributing to the development of advanced critical thinking skills among participants. Zou et al. (2024) further explored how interdisciplinary and cross-institutional collaborations in grant proposals led to innovative research designs. For instance, a proposal for a multi-institutional study on infectious diseases required collaborative efforts to design complex research methodologies and manage diverse research teams, which fostered critical thinking and creativity. Nonetheless, Adams et al. (2016) identified challenges in managing these proposals, such as coordinating between institutions and managing diverse expectations. Their study found that these challenges complicated the proposal process and affected its overall effectiveness. For example, differing priorities and communication issues between collaborating institutions led to delays and misunderstandings, emphasizing the need for more streamlined coordination and communication strategies in collaborative grant proposals.

International collaborations have been noted for exposing students to global perspectives and methodologies, enriching their critical thinking skills. Romanello et al. (2023) examined an international research project on climate change involving institutions from multiple countries. This project provided students with diverse cultural and scientific perspectives, enriching their understanding of global issues and promoting critical thinking. Chaparro-Banegas et al. (2024) further explored how global partnerships in sustainable development offered varied research practices. Students engaged in international collaborations to address issues like renewable energy and environmental conservation, gaining insights into different approaches and methodologies, which enhanced their problem-solving skills. However, Wong-Pérez et al.

highlighted logistical and cultural barriers that could hinder international collaborations. They reported that differences in academic practices and communication styles created challenges, such as difficulties in aligning research objectives and resolving misunderstandings. For example, differing academic expectations and communication norms

Overall, recent literature reveals several critical gaps in the effectiveness of academic collaborations in fostering graduate students' critical thinking skills. Key issues include the need for better integration of theoretical models with practical constraints, addressing cultural and contextual mismatches, ensuring equitable access to technological resources, and overcoming logistical and administrative challenges. Addressing these gaps is deemed crucial for enhancing the impact of academic collaborations on critical thinking development.

2.2.3 The role of Guided Facilitations in Promoting Critical Thinking Skills among Graduate Students at Universities

Recent research, for example, studies by Muslim (2024) has underscored the pivotal role of guided facilitation methods in advancing critical thinking skills among graduate students across various disciplines. This review has synthesized findings on diverse guided facilitation approaches employed globally, focusing on their impact on graduate students at universities. The review has highlighted how these methods contribute to developing students' critical thinking abilities and identified areas for improvement.

At Harvard Medical School, guided facilitation was rigorously applied through structured clinical case discussions and Socratic questioning. Shapiro-Garza et al. (2020) illustrated how iterative questioning during the analysis of intricate patient cases could significantly enhance diagnostic accuracy and critical thinking. One notable example involved a case study where students had to analyze a patient presenting with multi-system symptoms, requiring them to

perform differential diagnoses and integrate various diagnostic tests. This approach fostered a deeper engagement with clinical reasoning and decision-making processes. The Socratic method, which encouraged probing questions and reflective dialogue, was particularly effective in helping students explore underlying principles and justify their clinical decisions. However, Bui et al. (2024) identified a critical limitation in these methods. They noted that the patient scenarios often lacked cultural diversity, which restricted students' exposure to varied socio-economic and cultural contexts. For instance, a case scenario centered on a diabetic patient from a Western context might not encompass the diverse dietary practices and health beliefs prevalent in other cultures. To address this gap, the integration of culturally diverse patient cases, such as scenarios involving patients from different ethnic backgrounds or global health challenges, was recommended to enhance students' preparedness for a wide range of global health issues.

At Stanford Graduate School of Business, structured guided facilitation was employed through detailed business case studies and interactive group discussions. Skinner et al. (2020) reported that this approach effectively bridged theoretical knowledge with practical business problems, thereby enhancing strategic decision-making and problem-solving skills. One illustrative case study required students to develop a market entry strategy for a tech startup entering a new international market. Students analyzed competitive forces, market trends, and consumer behavior to formulate a comprehensive strategy, which helped in translating theoretical concepts into actionable business plans. Despite these benefits, Moorhouse et al. (2023) pointed out that many case studies lacked context-specific details. For instance, a case study on global supply chain disruptions did not account for regional variations in logistics or trade policies, which affected the relevance of the scenario. To address this limitation, incorporating localized details, such as regional economic conditions or industry-specific

challenges, into case studies was recommended. Enhancing the context specificity of case studies could provide students with more applicable and relevant learning experiences.

At the University of Toronto, structured case studies focused on health crisis management were used as a guided facilitation method. Miller-Thompson (2020) found that this approach significantly improved students' abilities in strategic planning and problem-solving. One example involved a case study simulating a health crisis, such as an outbreak of a novel infectious disease, requiring students to develop comprehensive response plans. This scenario included elements like resource allocation, public health messaging, and coordination with healthcare providers, which provided a holistic view of crisis management. However, Greenhalgh et al. (2016) noted that many case studies concentrated predominantly on medical interventions, often neglecting broader socio-economic factors. For instance, a scenario that focused solely on vaccine distribution strategies might not consider issues such as healthcare accessibility and socio-economic disparities. Expanding case studies to include socio-economic considerations, such as addressing healthcare access in underserved communities, was suggested to offer a more comprehensive understanding of public health challenges.

At the University of Cape Town, non-structured guided facilitation was implemented through open discussion forums and collaborative workshops. Sakala (2023) reported that open discussion forums fostered critical thinking by enabling spontaneous dialogues on diverse topics. For example, a forum discussing the impact of climate change on local communities allowed students to explore various perspectives and challenge prevailing ideas. Collaborative workshops provided informal settings for applying theoretical concepts, such as developing community health interventions or sustainability projects. Despite these benefits, Sims and Cilliers (2023) identified challenges such as inconsistent student engagement and varying levels of background knowledge. These issues sometimes led to uneven contributions during discussions and

workshops. To address these challenges, strategies such as pre-session preparatory materials and structured facilitation techniques were recommended to enhance engagement and ensure that all students had the necessary background knowledge.

At the University of Alberta, non-structured guided facilitation was applied through student-led seminars and peer review activities. Dianati (2024) found that student-led seminars, where students presented topics and facilitated discussions, were effective in encouraging critical thinking. For instance, a seminar on the ethics of artificial intelligence required students to analyze and present arguments from multiple viewpoints, fostering in-depth discussion and reflection. Peer review activities, which involved evaluating and providing feedback on each other's work, further enhanced evaluative and reflective skills. However, Chen et al. (2024) noted challenges such as difficulties in providing constructive feedback and managing group dynamics. For example, students often struggled with delivering actionable feedback or navigating conflicting viewpoints during peer review sessions. To improve the effectiveness of these methods, guidelines on constructive feedback and strategies for managing group dynamics were recommended.

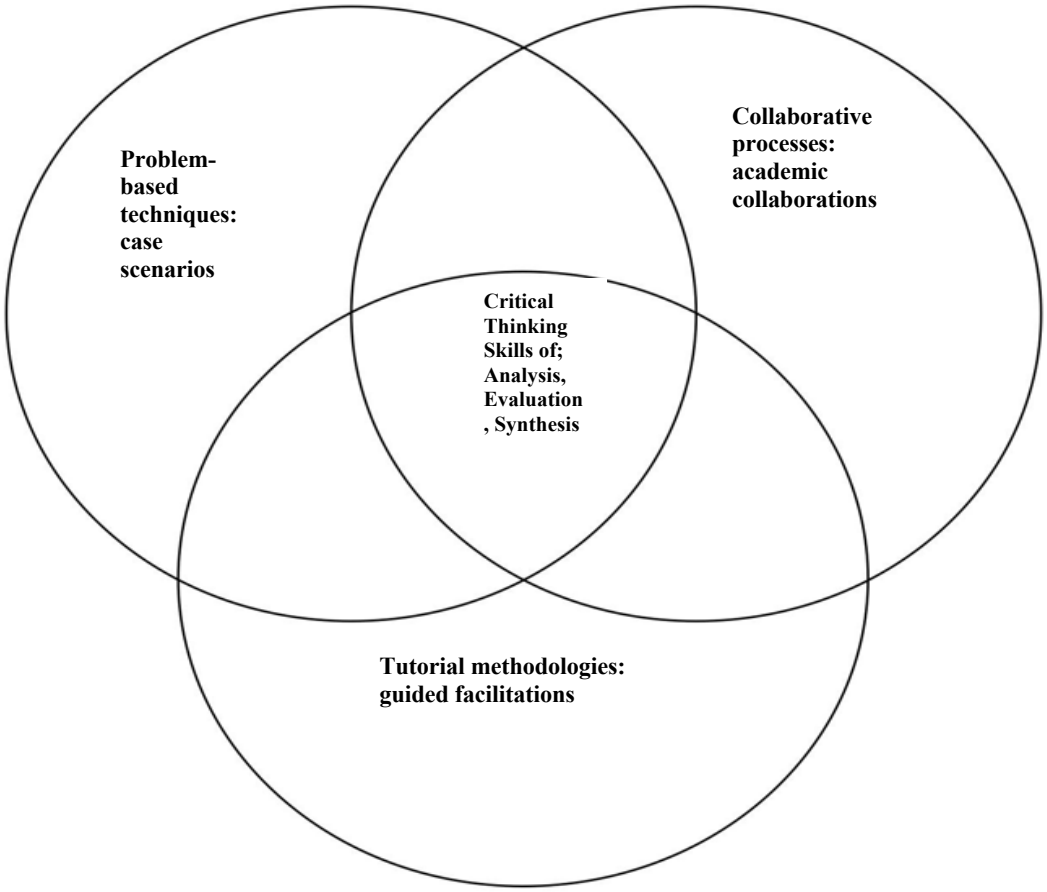
In summary, the literature review has revealed several gaps in guided facilitation methods for promoting critical thinking among graduate students. Key issues include a lack of cultural and contextual diversity in structured case studies, which limits students' exposure to varied socio-economic and cultural contexts. Many methods suffered from oversimplified scenarios that did not capture real-world complexities, while outdated or generalized role-playing scenarios failed to address contemporary issues and diverse problem-solving situations. Additionally, non-structured approaches like open discussions and peer reviews faced challenges related to inconsistent student engagement and difficulties in providing constructive feedback. Addressing these gaps by incorporating more diverse, realistic, and contextually relevant scenarios, and

improving student engagement and feedback processes, was deemed crucial for enhancing the effectiveness of guided facilitation methods and better preparing students for their professional careers.

2.2.4 Summary of the Review of Related Literature

The literature review revealed critical gaps in several areas impacting the development of critical thinking among graduate students. In Problem-based learning (PBL), Piaget's cognitive constructivism, Vygotsky's socio-cultural theory, Bloom's taxonomy, Kolb's experiential learning theory, self-determination theory, and the community of Inquiry model each highlighted the need for improved longitudinal studies, consideration of cultural and individual differences, standardized assessment tools, varied learning styles, balanced autonomy and support, and effective online strategies. In the application of case scenarios, there are deficiencies in cultural diversity, relevance to contemporary issues, and real-world complexity across disciplines such as medicine, law, business, public health, engineering, and education. Academic collaborations are hindered by issues such as the lack of integration between theory and practice, inadequate consideration of cultural differences, high costs of technology, logistical challenges, insufficient support for student-led initiatives, and coordination problems in grant proposals. Additionally, guided facilitation methods suffer from a lack of diversity and realism in scenarios, outdated role-playing, and challenges in student engagement and feedback. Addressing these gaps is crucial for enhancing the effectiveness of PBL, case scenarios, academic collaborations, and guided facilitation methods in fostering critical thinking and better preparing students for their professional careers.

Figure 1.1: Conceptual Framework of the Study



Source: Adapted from Habermas's Critical Inquiry Fframework (Habermas, 1984).

The conceptual framework for Problem-Based Learning (PBL) emphasizes three core components case scenarios, academic collaborations, and guided facilitation as essential drivers for developing critical thinking skills, specifically application, analysis, evaluation, and synthesis.

Case Scenarios: These involve complex, real-world problems that require students to apply theoretical knowledge in practical contexts. Students engage in application by using their knowledge to address the scenario, analysis by breaking down the problem into components, and

synthesis by creating comprehensive solutions. For example, analyzing educational disparities encourages students to evaluate causes, propose interventions, and devise action plans.

Academic Collaborations: In PBL, students work together, exchanging ideas and perspectives. This collaborative process fosters critical discourse, where students analyze diverse viewpoints, evaluate the merits of different approaches, and synthesize these ideas into cohesive solutions. Group discussions enable a deeper understanding of the issue and refine students' critical thinking abilities.

Guided Facilitation: Facilitators guide students through the learning process by asking probing questions, offering feedback, and encouraging self-reflection. This supports application by prompting students to relate theories to new problems, analysis by guiding them to critically examine information, evaluation by helping them assess the effectiveness of ideas, and synthesis by encouraging the integration of diverse perspectives.

Overall, these three components of PBL work synergistically to foster the development of critical thinking skills, helping students engage deeply with problems, analyze and evaluate information, and generate creative solutions. This process equips students with the cognitive tools necessary to solve complex, real-world issues in academic and professional settings.

Chapter Three

Methodology

3.0 Introduction

This chapter covers the methodology of the study. Specifically, it addresses the study's philosophy, approach, research design, study population, sample size, and sampling techniques. The chapter also includes the issues of data collection techniques, data collection instruments, quality control, data analysis methods, study assumptions, limitations of the study, and ethical considerations.

3.1 Research Philosophy

This study was grounded in the philosophy of critical theory, with a specific focus on Jürgen Habermas's of critical inquiry. Critical theory posits that knowledge is not static or purely objective but is continually shaped by social interactions, power dynamics, and historical contexts (Habermas, 1984). It emphasises that knowledge should not only describe the world but also critique and transform societal structures. This approach was chosen for its ability to provide a better understanding of how problem-based learning (PBL) could foster critical thinking by encouraging reflective dialogue and challenging existing norms (Maviglia, 2015).

Habermas's critical inquiry was instrumental in guiding the study by focusing on communicative action and rational discourse. According to Habermas, meaningful knowledge arises from open and free discussions where participants critically engage with and question existing assumptions (Habermas, 1984). This perspective guided the analysis of PBL components such as case scenarios, academic collaborations, and guided facilitations to understand how they contributed to the development of critical thinking skills. By immersing students in real-world problems and fostering collaborative, reflective discussions, PBL aligned with the principles of critical inquiry, creating an environment conducive to transformative

learning (Pereira & Pedro, 2023). For instance, the study explored how case scenarios bridged theoretical knowledge with practical application, facilitating reflective discussions that challenged existing paradigms.

Critical theory was preferred over other epistemological stances such as positivism and constructivism due to its comprehensive approach to addressing the influence of societal norms and power structures on knowledge. Positivism, which emphasizes objective measurement and empirical verification, often overlooks the impact of social contexts and does not fully capture the dynamic nature of learning processes (Clark et al., 2021). Constructivism, while valuable for understanding individual knowledge construction, primarily focuses on personal learning processes and does not adequately address how societal norms and power dynamics shape knowledge (Kelly, 2018).

Recent scholarship continues to affirm the relevance of critical theory in educational research. For instance, Darder et al. (2023) highlights its role in addressing issues of power and inequality in learning environments, while McLaren (2015) emphasizes its importance in transformative educational practices. In more recent works, researchers such as Knox and Pinar (2021) have reinforced the significance of critical theory in promoting educational practices that challenge prevailing social structures and support emancipatory learning. By employing critical theory, this study provided a comprehensive analysis of how PBL promoted critical thinking and transformative learning. This philosophical approach ensured a focus on how PBL practices encouraged students to engage in critical dialogue, challenge societal norms, and refine their understanding in a meaningful and socially conscious manner.

3.2 Research Approach

This study employed a qualitative research approach to explore how problem-based learning (PBL) enhances critical thinking skills among graduate students. Qualitative research is particularly effective for investigating complex phenomena and gaining a deep understanding of participants' experiences and perceptions (Mantula et al., 2024). It focuses on interpreting social realities from the perspectives of those involved, rather than quantifying variables or testing hypotheses (Fusch et al., 2018). The qualitative approach was selected over quantitative methods due to its ability to provide a rich, contextual understanding of the educational process and its outcomes. While quantitative research emphasizes statistical analysis and measurement of variables, it may not fully capture the intricacies and subjective experiences related to PBL (Braun & Clarke, 2019). Qualitative research, on the other hand, allows for an in-depth exploration of how PBL affects students' critical thinking through detailed and narrative data (Guest et al., 2020). This approach offers flexibility and adaptability, enabling researchers to uncover emerging themes and insights as they arise during the study (Staes et al., 2020)

In this study, qualitative methods such as personal interviews, focus group interview (FGI), and document checks were utilized. Personal interviews provided comprehensive individual perspectives on students' experiences with PBL, revealing that participants found PBL to be instrumental in developing their critical thinking skills by challenging their assumptions and encouraging deeper analysis (Tarchi & Mason, 2020). Focus group interview facilitated collective discussions among students, uncovering common themes and diverse viewpoints on the impact of PBL. A significant theme identified was the enhancement of critical thinking through collaborative learning, as participants noted how engaging with peers broadened their analytical perspectives (Smith et al., 2021).

Document check supplemented these findings by examining relevant course materials and feedback, which illustrated how PBL was implemented and its effects on students' critical thinking development (Greene & Yu, 2016). By using a qualitative approach, the study captured the detailed and contextually rich experiences of students engaged in PBL, providing a deeper understanding of how this educational method fosters critical thinking. This approach was essential for achieving the study's goal of exploring the transformative effects of PBL on graduate students' critical thinking skills.

3.3 Research Design

This study employed an exploratory case study design to explore the impact of problem-based learning (PBL) on critical thinking skills among graduate students, a choice well-suited for examining complex and relatively unexplored phenomena within their natural contexts (Ebneyamini & Sadeghi Moghadam, 2018). By focusing on specific instances of PBL implementation, this design facilitated a deep and adaptable investigation into how PBL influences critical thinking in real-world educational settings.

Exploratory case studies are particularly effective for understanding intricate and multifaceted issues, as they provide valuable insights into context-specific dynamics (Fusch et al., 2018). This approach allowed for a comprehensive analysis of how PBL operates within different educational environments, revealing its practical implications for enhancing critical thinking. Additionally, such studies contribute to theory development by linking empirical data with real-world contexts, thus helping to build and refine educational theories related to PBL and critical thinking (Babchuk, 2017). Given the relatively unexplored nature of PBL's effects, the design also facilitated the discovery of new insights and hypotheses, with Braun and Clarke (2021) noting its effectiveness in uncovering new dimensions of emerging educational practices. The iterative nature of the exploratory case study further enabled the refinement of research

questions and methods based on emerging data, capturing the dynamic nature of PBL's impact on critical thinking (Klenowski & Wyatt-Smith, 2015).

In this study, the exploratory case study design was applied through a range of qualitative methods to examine how problem-based learning (PBL) influences critical thinking skills among graduate students. Personal interviews offered in-depth insights into students' individual experiences with PBL, showing how it challenged existing beliefs and enhanced analytical skills (Dodgson, 2017). Focus group interviews (FGIs) revealed collective perspectives on PBL, highlighting how collaborative learning and peer interactions within PBL fostered critical thinking (Braun & Clarke, 2021). Document analysis provided concrete examples of PBL implementation by reviewing course materials and feedback, which validated and contextualized the findings from interviews and FGIs (Silverman, 2016). The integration of these methods allowed for a comprehensive and nuanced exploration of PBL's impact, offering valuable insights into its effectiveness in developing critical thinking skills and contributing to a deeper understanding of educational practices and outcomes.

3.4 Target Population

The study targeted three distinct groups within the Master of Education in Education Management programme to explore the impact of problem-based learning (PBL) on critical thinking skills. Current graduate students, actively enrolled at the time, provided immediate feedback on their PBL experiences through focus groups interview, offering insights into real-time impacts on their critical thinking. Graduates from the 2015 cohort contributed retrospective perspectives on how PBL influenced their critical thinking and professional practices post-graduation through follow-up interviews. Teaching staff members provided valuable input on the design, implementation, and challenges of PBL in the curriculum via interviews. Each group was

chosen to offer a comprehensive view of PBL's effects, ensuring a well-rounded analysis by capturing real-time experiences, long-term impacts, and practical implementation challenges.

3.5 Sample Population

The sample population for this study, comprising ten current graduate students, three lecturers, and ten graduates from the 2015 cohort, was strategically selected to provide a comprehensive examination of problem-based learning (PBL) and its impact on critical thinking. Lecturers were chosen for their insights into the instructional design and implementation of PBL, essential for understanding the pedagogical challenges and strategies involved (Kember & Kember, 2016). Current graduate students offered immediate feedback on how PBL influenced their critical thinking skills during their studies (Dodgson, 2017). while graduates provided retrospective evaluations of PBL's long-term effects on their professional development (Fairman et al., 2022). The decision to include three lecturers and ten graduate students ensured a balance between practical constraints and the need for diverse perspectives, thereby enabling a thorough and representative analysis of PBL's effectiveness and implications.

3.6 Sampling Technique

The most suitable purposive sampling technique for this study was homogeneous sampling**,** chosen for its focus on selecting participants who shared specific characteristics namely, direct experience with problem-based learning (PBL) at Gulu University, either as current students, lecturers, or graduates. Homogeneous sampling was particularly advantageous over other purposive techniques, such as criterion sampling or expert sampling, because it enabled a deep exploration of how this shared experience influenced critical thinking and professional development across these different but related groups (Etikan et al., 2016). In this study, homogeneous sampling was employed by carefully selecting participants from each group, ensuring that all had a common foundation in PBL. This approach facilitated meaningful

comparisons and contrasts between the immediate effects on current students, the pedagogical insights of lecturers, and the long-term impacts on graduates.

Despite challenges such as limited availability of participants due to busy academic schedules, difficulties in reaching potential participants because of geographical or institutional barriers, and reluctance to engage in research due to concerns about confidentiality or time commitments, the study effectively utilized university records, leveraged established networks, and drew on personal contacts to recruit participants. This strategic approach ensured that the study met its research objectives and provided richer insights into PBL's role in enhancing critical thinking skills.

3.7 Data Collection Methods

The study utilized qualitative methods such as interviews, focus group interview (FGI), and document checks to gather data. Interviews provided detailed individual insights from lecturers, current graduate students, and graduates on their experiences with Problem-Based Learning (PBL).

3.7.1 Interviews

I used semi-structured one on one interviews to gather in-depth insights from participants regarding their experiences with problem-based learning (PBL). I designed an interview guide with open-ended questions to ensure flexibility while maintaining focus on the research objectives (Creswell & Poth, 2018). The semi-structured format allowed me to steer the conversation around key topics relevant to PBL and critical thinking, while also giving participants the freedom to express their views in their own words.

During the interviews, I started with broad questions to encourage detailed responses and then used follow-up questions to probe deeper into specific areas of interest. A total of 13

interviews were conducted with lecturers and students. This approach enabled me to adapt to each participant's responses, exploring their experiences and perceptions more thoroughly. For instance, when participants shared initial thoughts about how PBL impacted their critical thinking, I asked clarifying questions to delve into particular examples or challenges they faced. This adaptability was crucial in capturing the nuances of their experiences.

However, I encountered challenges such as scheduling conflicts with busy lecturers and graduates, which required flexibility in arranging interview times. Additionally, some participants needed more prompting to elaborate on their responses due to the open-ended nature of the questions. Despite these issues, the semi-structured format of the interviews allowed me to gather comprehensive and relevant data. The ability to adjust the conversation flow based on participants' responses ensured that I obtained a rich, detailed understanding of PBL's effects on critical thinking, forming a robust basis for analyzing and interpreting the study's findings.

3.7.2 Focus Group Interview (FGI)

Focus group interviews (FGIs) was conducted using a semi-structured interview guide to facilitate collective discussions and gather insights from participants about their experiences with Problem-Based Learning (PBL). One focus group discussion with 10 graduate students was conducted. I designed the guide with open-ended questions to encourage a dynamic exchange of ideas and ensure that discussions remained relevant to the research objectives (Dodgson, 2017). The semi-structured nature of the guide allowed me to maintain flexibility in the conversations while steering them towards key themes related to PBL's impact on critical thinking.

During the FGI, I created a collaborative environment where participants could interact and build on each other's responses. I started the discussions with broad questions to explore general impressions of PBL, and then used follow-up questions to probe deeper into specific

issues as they emerged. For example, if a participant mentioned a particular challenge with PBL, I prompted the group to discuss their experiences and opinions on similar challenges, facilitating a richer and more comprehensive understanding of the collective viewpoints. The FGDs comprised six to twelve participants.

To ensure that all participants had the opportunity to contribute, I employed techniques such as round-robin questioning and encouraged quieter members to share their thoughts. This approach helped capture a wide range of perspectives and fostered a balanced discussion, revealing common themes and divergent opinions within the group.

Despite the benefits, some challenges included managing group dynamics and ensuring that all voices were heard, which required careful facilitation. Overall, the semi-structured FGIs provided valuable collective insights into how PBL influences critical thinking, highlighting both shared experiences and unique perspectives. This method enriched the study by offering a nuanced view of PBL's impact through interactive dialogue and reflection among participants.

3.7.3 Document Checks

In this study, I utilized document checks to systematically review and analyze relevant educational documents associated with Problem-Based Learning (PBL) within the Master of Education in Education Management programme. Document checks, as described by (Dodgson, 2017), involved evaluating various types of documents to extract pertinent information and ensure adherence to predefined criteria. Specifically, I used document checks to examine course syllabi, instructional materials, student feedback forms, and reports on PBL implementation. The aim was to assess how PBL was documented, implemented, and evaluated in practice. For instance, I reviewed course syllabi to verify how PBL activities were integrated into the curriculum and whether they aligned with the goals of enhancing critical thinking. I analyzed

student feedback forms to understand students' perceptions of PBL and how it impacted their critical thinking skills. Additionally, I looked at implementation reports to evaluate how PBL was executed and any challenges encountered.

Challenges in using document checks included managing the diversity of document types and ensuring their relevance to the research questions. To overcome these, I carefully selected documents directly related to PBL and cross-referenced them with data from interviews and focus groups. This approach allowed me to corroborate findings from different sources and provided a richer, more comprehensive understanding of PBL's implementation and impact. By integrating document checks with other data collection methods, I was able to validate and enrich the insights gathered, thereby enhancing the overall reliability and depth of the study's findings.

3.8 Data Collection Instruments

In this study, I utilized three main data collection instruments to ensure a thorough exploration of Problem-Based Learning (PBL) within the Master of Education in Education Management program: an interview guide, a focus group interview (FGI) guide, and a document checklist.

3.8.1 Interview Guide

In this study, I used a semi-structured interview guide to align with my research objectives and questions, balancing consistency with flexibility. I designed the guide to address key aspects of Problem-Based Learning (PBL), such as participant experiences and impacts on learning outcomes, by including targeted questions like, "Can you describe how PBL has influenced your approach to problem-solving?" The guide was organized into thematic sections

to systematically cover relevant topics while allowing natural conversation flow (Braun & Clarke, 2022).

I incorporated open-ended questions to capture detailed, nuanced responses and maintained flexibility by adapting the guide based on participants' answers (Westbrook, 2024). To ensure consistency, I used the core questions across all interviews, which facilitated comparison and analysis (Weller et al., 2018). I probed more on emerging issues to gain in-depth understanding. Challenges included managing varying participant engagement levels and balancing structure with flexibility. I addressed these by adjusting questions and prompts as needed (Silverman et al., 2017). Overall, the semi-structured guide was effective in gathering comprehensive and relevant data while accommodating the flow of the interviews.

3.8.2 Focus Group Iinterview (FGI) Guide

I utilized a Focus Group Interview (FGI) guide to semi-structure group discussions, aiming to gather diverse perspectives on Problem-Based Learning (PBL). The guide included semi-structured questions and prompts designed to foster interaction among group members and ensure that discussions remained relevant to the research objectives. For example, I crafted questions like, “How has PBL impacted your approach to teamwork?” to stimulate engagement and encourage participants to share their experiences and viewpoints. This approach facilitated dynamic interactions within the group, allowing participants to build on each other’s responses and explore a wide range of perspectives on PBL (Rees Lewis et al., 2019).The choice of using the FGI guide was justified by its ability to generate rich qualitative data through group interactions. Focus groups are particularly effective for exploring how individual opinions are shaped by group dynamics, providing a more comprehensive understanding of complex issues like PBL compared to one-on-one interviews (Harwood, 2023). The semi-structured format of

the guide allowed for flexibility in probing deeper into emerging topics while keeping discussions focused on the core areas of interest (Kruegar & Casey, 2022)

Despite the advantages, I encountered several challenges. One significant challenge was managing group dynamics, particularly ensuring that all participants had an opportunity to contribute. Dominant voices sometimes overshadowed quieter members, so I employed facilitation techniques and used the guide to direct questions to specific individuals, encouraging a balanced discussion (Jefferson et al., 2023). Another challenge was keeping discussions on track, as conversations occasionally veered off topic. To address this, I periodically referred back to the guide and used prompts to refocus the group on the relevant research objectives (Morgan, 2023). Additionally, balancing diverse opinions and ensuring that all viewpoints were explored required careful facilitation. I structured the guide to include prompts that encouraged the exploration of different perspectives, which helped capture a broad range of opinions while maintaining coherence in the discussions (Krueger & Casey, 2022). Overall, the FGI guide proved invaluable for systematically exploring participants' experiences with PBL, allowing for a comprehensive and nuanced understanding of the topic while effectively managing the challenges associated with focus group discussions.

3.8.3 Document Checklist

In my study, I employed a document checklist to ensure the quality, compliance, and consistency of the document analysis process. This checklist, as endorsed by Creswell and Hirose (2019) was essential for maintaining a systematic approach to reviewing relevant documents. It included criteria such as the document's relevance to the research objectives, source credibility, and completeness of the information. By adhering to this checklist, I ensured that each document was evaluated thoroughly and consistently, thereby upholding high standards in the analysis (Bowen, 2024). The choice to use a document checklist was justified by its

effectiveness in providing a structured and consistent review process. Recent literature underscores the importance of checklists in maintaining systematic practices for document analysis, which is crucial for ensuring reliable and valid research findings((Xu & Croft, 2017). The checklist enabled me to methodically address all relevant aspects of each document, ensuring comprehensive and consistent analysis across various sources (Vaismoradi et al., 2016). This structured approach is particularly vital in qualitative research, where the accuracy and depth of document analysis can significantly influence the study's outcomes.

Several challenges emerged during the use of the checklist. One challenge was the variability in document quality and format, which could impact consistency in the analysis. To address this, I standardized the evaluation criteria using the checklist, ensuring that all documents were assessed against the same standards regardless of their format or level of detail (Bowen et al., 2022). Another challenge involved the complexity of some documents, which required more detailed scrutiny and could be time-consuming. To manage this, I adjusted the checklist to include additional prompts for handling complex documents and allocated extra time for their review, ensuring that detailed information was captured and analyzed accurately (Haynes-Brown & Fetters, 2021). Additionally, ensuring that all relevant information was reviewed and not overlooked was a concern. I mitigated this by regularly updating the checklist and conducting periodic reviews to verify that all critical information was included in the analysis (Saunders et al., 2023). Overall, the document checklist proved to be an invaluable tool in maintaining the quality and consistency of the document analysis process. By systematically applying the checklist, I ensured a thorough and reliable analysis while effectively managing the challenges encountered.

3.9 Quality Control

To ensure the trustworthiness and reliability of my study's data collection and instruments, I implemented rigorous quality control measures following the principles of credibility, transferability, dependability, and confirmability, as outlined by (Weyant, 2022). These principles guided my approach to ensure robust and credible research outcomes.

Credibility was achieved through meticulous verification of sources and the use of current, relevant information. I cross-checked data from multiple sources to ensure accuracy and incorporated triangulation to enhance the validity of the findings (Haynes-Brown & Fetters, 2021). Additionally, I employed member checking, where participants reviewed and confirmed the accuracy of their transcriptions, which helped in validating the data and capturing participants' true views (Slettebø, 2021).

Transferability was enhanced by providing rich, contextual information about the fieldwork sites. This detailed description allowed readers to assess the applicability of the findings to similar contexts. By offering a thorough account of the settings and participant demographics, I aimed to facilitate comparisons and enhance the generalizability of the results (Sarkar et al., 2024).

Dependability was assured through transparent documentation of the research process, including the methods for data collection and analysis. This transparency was crucial for enabling others to replicate the study and verify its findings (Vaismoradi & Snelgrove, 2019). I clearly communicated the research purpose and the roles of participants to foster trust and reliability in the data collected.

Confirmability was maintained through comprehensive documentation of all research procedures, ensuring that findings were a result of the data rather than researcher bias. Detailed

records of the data collection and analysis processes allowed future researchers to verify and confirm the results (Moser & Korstjens, 2022). Memoing, data audits, and record-keeping were ensured to achieve data quality.

The choice of these quality control measures was justified by their ability to address potential biases and enhance the reliability of the study. While other approaches, such as purely quantitative measures, were considered, the principles of credibility, transferability, dependability, and confirmability offered a holistic framework for ensuring the trustworthiness of qualitative research. Challenges such as potential researcher bias were mitigated through strategies like member checking and peer debriefing (CohenMiller et al., 2022). I went to the field as a researcher willing to gain understanding from participants. Overall, these quality control measures were integral in producing credible, transferable, dependable, and confirmable research outcomes, ensuring the rigor and integrity of the study.

3.10 Administration Procedures

In this study, I carefully crafted the administration procedures to ensure the rigor of the research process, with ongoing guidance from my supervisors. I began with the creation of a concept note, which, under their expert guidance, received preliminary feedback and refinement from the Doctoral Committee. This initial step was critical for sharpening the research focus and ensuring alignment with academic standards. Following this, I developed a detailed research proposal, which was submitted to the Dean’s Office for review, with my supervisors providing key insights and recommendations. After successfully defending the proposal before the Research and Higher Degrees Committee, I then submitted the compliance report and the corrected proposal to the Directorate of Research and Graduate Training (DRGT), again benefiting from my supervisors' advice. Following approval, I obtained an introductory letter

(attached on the report) from the Dean to facilitate my fieldwork, with my supervisors' support ensuring that the process adhered to all required protocols.

3.11 Data Analysis

In my study, I employed inductive thematic analysis as the primary method for analyzing qualitative data. This approach was chosen for its ability to allow themes to emerge organically from participants' responses without the imposition of preconceived notions. Inductive thematic analysis is particularly valuable for exploring diverse perspectives and uncovering nuanced insights into complex research topics (Braun & Clarke, 2019). Inductive thematic analysis involves an iterative process where I immersed myself in the data, generating codes, and identifying themes that reflect participants' experiences and viewpoints. This method was ideal for my study as it provided the flexibility needed to adapt to the emerging nature of the data.

I began by transcribing interviews and focus group discussions verbatim, ensuring that I captured participants' responses accurately. I then engaged in open coding, systematically labeling segments of data to identify initial patterns and concepts. These codes were subsequently grouped into broader themes that captured the essence of the participants' experiences with Problem-Based Learning (PBL) (Nowell et al., 2017). Selective coding aided in creating relationships among the categories. The choice of inductive thematic analysis was justified by its suitability for exploring the complex, qualitative aspects of PBL. Unlike deductive approaches that test preconceived theories, inductive analysis allowed me to build themes from the ground based on participants' direct input. This approach aligns with the study's goals of capturing rich, contextually grounded insights and providing a comprehensive understanding of participant experiences (Clarke & Braun, 2017). Additionally, inductive thematic analysis supports theoretical development by generating new insights rather than merely confirming existing theories.

Several challenges emerged during the analysis. One significant challenge was managing subjectivity in interpretation, as the analysis process can be influenced by the researcher's perspectives. Some themes already exited in literature, thus not able to distinguish them from inductive ones. To address this, I employed rigorous coding practices and engaged in regular team discussions to validate interpretations and ensure that multiple viewpoints were considered (Thorne, 2016)The time-intensive nature of thematic analysis was another challenge.

I mitigated this by utilizing systematic data management techniques, such as detailed coding frameworks and iterative review processes, to streamline analysis and maintain rigor (Braun & Clarke, 2021). The inductive approach provided several benefits. It facilitated a holistic understanding of participant experiences by capturing the depth and complexity of their responses. The iterative nature of thematic analysis allowed for continuous refinement of themes, which enhanced the validity of the findings through systematic validation techniques like member checking. By incorporating feedback from participants, I ensured that the themes accurately reflected their experiences and perspectives (Birt et al., 2016). Overall, inductive thematic analysis was instrumental in producing comprehensive, credible findings rooted in empirical data. Its flexibility, ability to generate new insights, and emphasis on participant perspectives made it the most suitable choice for my study.

3.12 Ethical Considerations

In my study, ethical considerations were paramount to ensuring the integrity and credibility of the research process. I implemented several key ethical practices to uphold the highest standards of respect and fairness for participants. Below, I detail how these practices were applied in my research, supported by evidence and examples:

I prioritized informed consent as a fundamental aspect of respecting participant autonomy and ensuring voluntary participation (Scheepers et al., 2023). To achieve this, I used a comprehensive consent form that outlined the research objectives, methods, risks, benefits, and participants' rights. I made sure participants had ample time to read the form and ask questions to ensure they fully understood what their participation entailed. Given that some participants had varying literacy levels, I translated the consent forms into simple languages and provided verbal explanations (Pigozzi, 2015).

Maintaining confidentiality was crucial in my study. I anonymized participants' data by using pseudonyms and numerical codes to protect their personal information and ensure data was used only for its intended purpose (Hirvonen, 2022). I stored data securely in password-protected and encrypted databases, with access limited to authorized personnel. During the data sharing phase, I faced challenges in ensuring confidentiality. To address this, I used encrypted platforms for data transmission and adhered to strict protocols for data handling (O'Leary, 2021). For example, when sharing data with collaborators, I utilized secure file-sharing services to prevent unauthorized access.

I took steps to safeguard participants' privacy by conducting interviews in secure, private settings. For remote data collection, I provided guidelines to participants to maintain their privacy and used encrypted platforms for communication. One significant challenge was maintaining privacy during remote data collection. To mitigate this, I advised participants on securing their environments and employed encrypted communication tools like Zoom with end-to-end encryption (Olivieri et al., 2023). This approach helped ensure that conversations remained private and secure.

Ensuring gender equity was a core component of my research. I recruited participants without gender bias and made efforts to include a diverse range of gender backgrounds (Ohly & Draude, 2021). The participants were both male and female, and neutral language was used through the study. I conducted data analysis with sensitivity to prevent gender-based biases and ensured that gender did not skew the interpretation of findings. Achieving gender equity in recruitment was challenging due to societal imbalances. I addressed this by implementing targeted recruitment strategies and monitoring gender representation throughout the study. For example, I partnered with directorates that focus on gender diversity to reach underrepresented groups (Noland et al., 2016).

I aimed to provide equal opportunities for participation and address any barriers that might exclude certain groups (Liao et al., 2015). I offered multiple participation methods, including both online and in-person options, and accommodated various accessibility needs. Reaching participants in remote or underserved areas posed a challenge, some former graduates were located in remote areas. To overcome this, I employed outreach strategies such as collaborating with local organizations and using online recruitment methods. This approach helped broaden access and ensured that more participants could engage with the study (Smyth, 2016). Clarifying data ownership was essential in my study. I established clear agreements on how data would be used, stored, and shared. Participants were informed of their rights to withdraw their data at any time, and I included detailed explanations in the consent form. Ensuring clarity on data ownership was challenging, so I provided opportunities for participants to ask questions and understand their rights fully. This approach helped build trust and ensured ethical management of the data collected (Sutton & Austin, 2015).

Maintaining anonymity and confidentiality was justified by the need to protect participants' personal information and uphold trust in the research process (Morse & Coulehan,

2015). By anonymizing data and securing sensitive information, I adhered to established ethical principles and legal requirements. Ensuring gender equity was crucial for producing unbiased and representative research findings. Gender bias can lead to skewed results and limit the applicability of findings. By actively promoting gender equity, I aimed to enhance the validity and inclusiveness of the research outcomes (Pedrajas & Jalandoni, 2023). In summary, the ethical considerations of informed consent, confidentiality, privacy, gender equity, access to participants, and data ownership were integral to my study. These practices ensured that participants were protected, their privacy was maintained, and the research findings were both representative and unbiased.

3.13 Limitations

In this study, I acknowledged limitations stemming from the specificity of my study context, potential for researcher bias, constraints in sample size and resources, and the inherent subjectivity of qualitative research. To address these, I delimited my study by focusing on a specific cohort within an educational program, ensuring depth of exploration through detailed interviews and document analysis. I prioritized thick descriptions to enhance understanding and applicability of findings, while rigorously adhering to ethical standards to protect participant rights. Overall, these strategies aimed to maximize the validity and relevance of my research within the defined scope of my study objectives.

Chapter Four

Presentation, Analysis, and Interpretation

4.0 Introduction

This chapter offered an in-depth analysis of how problem-based learning (PBL) enhanced critical thinking skills among graduate students at Gulu University, through the lens of Jürgen Habermas's critical inquiry framework. It examined the influence of PBL's key components case scenarios, academic collaborations, and guided facilitations on students' capacities for reflective and transformative learning. Employing a comprehensive multi-method approach, the study incorporated personal interviews, a focus group interview, and detailed document checks. Participants were carefully coded for clarity: recent graduates were identified as "G," lecturers as "L," and graduate students in the focus group interview as "FGI." By leveraging Habermas's principles of communication, discourse, and rational dialogue, this chapter elucidated how PBL not only fostered critical thinking but also highlighted its potential in challenging entrenched norms and advancing social change.

The chapter precisely covered the presentation, analysis, and interpretation of the findings of this study according to the objectives.

4.1 Findings

4.1.1 The Role of Case Scenarios in Nurturing Critical Thinking Skills among Graduate Students at Gulu University

Objective one aimed to explore how case scenarios nurture critical thinking skills among graduate students at Gulu University, guided by the research question: How do case scenarios nurture critical thinking skills among graduate students at Gulu University? To address this

question, several elements were examined, including perceptions of critical thinking, the roles of case scenarios, their benefits, and impact on developing critical thinking skills in graduate students.

4.1.1.1 Perceptions of Critical Thinking. Critical thinking was widely regarded as an essential skill in both academic and professional contexts. At Gulu University, various participants, including recent graduates, graduate students, and lecturers, provided valuable insights into their perceptions of critical thinking. These insights were categorized into three core concepts: analytical thinking, comprehensive evaluation and diverse perspectives, and creative problem-solving and synthesis.

4.1.1.1.1 Analytical Thinking. Firstly, recent graduates; G1, G2 and G3 emphasized the aspect of analytical thinking in understanding their perception of critical thinking. Analytical thinking involves breaking down complex problems and questioning assumptions to gain a clearer understanding of underlying issues. For instance, G1 reported,

> Critical thinking is grounded in analytical thinking, focusing on the systematic evaluation and synthesis of information to form reasoned judgements. It further, involve breaking down complex problems into smaller parts which helped me tackle research projects more effectively, as it allowed me to see the underlying issues clearly. (February 28, 2024, Gulu University).

This voice highlighted how crucial the ability to analyze data and interpret results was for making informed decisions in their professional roles. This insight from recent graduates underscored the practical application of analytical thinking in their work environments. Similarly, graduate students described analytical thinking as the ability to deconstruct theories and critically evaluate evidence. For instance, FGI stated, "critical thinking involves breaking

down complex ideas into their fundamental components to uncover underlying assumptions to and evaluate their validity. Seminars and workshops encouraged us to debate and discuss various theories, enhancing our analytical thinking skills" (February 5, 2024, Gulu University). The participant appreciated the role of academic discussions in developing their capacity to assess arguments critically and identify logical fallacies. This experience further illustrated how academic settings contributed to enhancing analytical skills.

Furthermore**,** lecturer L1's understanding of critical thinking focused on how analytical thinking was integrated into the curriculum through assignments and discussions. In particular, L1 explained;

> I perceive critical thinking with an analytical focus on curriculum integration highlighting the necessity of fostering evaluative skills across disciplines, ensuring students can systematically dissect and understand complex concepts within any subject. I incorporated analytical thinking into the curriculum by assigning case studies that required students to critically assess research articles" (February 28, 2024, Gulu University).

They emphasized their role in guiding students to construct well-reasoned arguments and foster an environment where critical evaluation was highly valued. This approach demonstrated the intentional design of educational practices to support the development of analytical thinking. To ensure these insights aligned with institutional practices, I verified them with the curriculum document. It was confirmed that the curriculum indeed incorporated analytical thinking through assignments and assessments designed to develop students' ability to critically evaluate research and case studies (March 10, 2024, Gulu University Master of Education Curriculum 2020).

4.1.1.1.2 Comprehensive Evaluation. In addition**,** comprehensive evaluation and diverse perspectives were mentioned by participants as critical elements of critical thinking, involving

the assessment of information from multiple viewpoints and integrating various perspectives. Insights from participants at Gulu University were gathered from recent graduates, graduate students, and lecturers, and the findings were validated against institutional documents. In particular**,** recent graduates; G4, G5 and G6 emphasized the significance of incorporating multiple viewpoints and evaluating information from diverse perspectives. Particularly, G4 mentioned, "Critical thinking is rooted in comprehensive evaluation, underscores that involve thoroughly analyzing and synthesizing information from diverse sources to form well founded conclusions. Group projects required us to integrate diverse perspectives, which was essential for developing a well-rounded understanding of issues" (January 22, 2024, Gulu University). This insight highlighted the value placed on collaborative efforts and integrating different viewpoints. It further shows how group work challenges the students to think and construct meaning.

Moreover**,** lecturer L2 discussed how diverse perspectives and comprehensive evaluation were embedded in their teaching practices and curriculum design. For example, L2 noted,

> Critical thinking is grounded in comprehensive evaluation, where students are encouraged to rigorously analyze. Questions and synthesis information across various subjects to develop well-reasoned perspectives. I used case studies from different cultures to teach students how to evaluate information from multiple angles, which was crucial for developing a comprehensive understanding" (March 29, 2024, Gulu University).

This approach reflected the importance of incorporating varied cultural contexts in teaching. I verified this with the curriculum document and established that it included assignments and activities that required students to evaluate information from diverse perspectives and integrate multiple viewpoints into their analysis (March 10, 2024, Gulu University Master of Education Curriculum 2020).

4.1.1.1.3 Creative Problem-Solving. Furthermore**,** creative problem-solving and synthesis were regarded as key aspects of critical thinking, involving the generation of innovative solutions and the integration of diverse information. At Gulu University, insights were gathered from recent graduates, graduate students, and lecturers regarding these concepts. Below is a summary of the findings from each group, including one cited participant from each category. In particular**,** recent graduates; G7, G8, G9 and G10 underscored the significance of creative problem-solving and synthesis in addressing complex challenges. For example, G7 noted, "Critical thinking is fundamentally linked to creative problem solving, encouraging students to but only analyze and evaluate information but also to generate innovative solutions to complex challenges. Working on interdisciplinary projects helped me to think creatively and synthesize different types of information to solve complex problems" (January 25, 2024, Gulu University). This insight reflected the integration of varied knowledge to develop innovative solutions.

Similarly**,** lecturer L3 focused on incorporating creative problem-solving and synthesis into their teaching practices and curriculum design. In particular, L3 explained,

> Critical thinking is an integrated approach within the curriculum that combines problem solving with evaluation; it involves not just understanding and analyzing information, but also applying these skills to solve complex problems creatively and effectively. We encouraged students to engage in projects that required them to synthesize information from multiple sources and develop creative solutions to real-world problems" (February 28, 2024, Gulu University).

This approach fostered students' ability to integrate information creatively. To validate these insights, I checked the curriculum and found that it included projects, case studies, and assignments that promoted creative problem-solving and required students to synthesize

information from diverse sources (March 10, 2024, Gulu University Master of Education Curriculum 2020).

In summary**,** the insights from recent graduates, graduate students, and lecturers at Gulu University collectively underscored the multifaceted nature of critical thinking, which encompassed analytical thinking, comprehensive evaluation, diverse perspectives, and creative problem-solving. These perspectives illustrated how each group valued and utilized these critical thinking components in their academic and professional experiences. The emphasis on breaking down complex problems, integrating diverse viewpoints, and synthesizing information across different contexts highlighted the curriculum's alignment with fostering these essential skills. Validation from institutional documents confirmed that Gulu University's educational practices and assignments effectively supported the development of critical thinking, preparing students to tackle complex issues with informed, innovative, and comprehensive approaches.

4.1.1.2 Roles of Case Scenarios. Case scenarios were recognized as essential tools in education, enhancing critical thinking and problem-solving skills. At Gulu University, insights from lecturers, recent graduates, and graduate students revealed the impact of case scenarios through practical application, experiential learning, and active learning.

4.1.1.2.1 Practical Application. Firstly, many participants' insights into the role of case scenarios emphasized practical application. Practical application referred to the use of theoretical knowledge in real-world contexts to solve problems and achieve goals. Case scenarios played a key role by providing concrete examples and contexts in which this knowledge could be tested and applied. They simulated real-world situations and challenges, enabling individuals to practice problem-solving, decision-making, and critical thinking in a controlled environment. By working through case scenarios, learners observed how concepts and principles operated in

practice, understood their implications, and refined their skills, thus preparing them for actual situations they might encounter in their professional or personal lives.

For instance, lecturer L2 noted that case scenarios were crucial for applying theoretical knowledge to real-world contexts. L2 explained, "I used case scenarios to help students apply theoretical concepts to practical problems, enhancing their ability to connect academic knowledge with real-world issues" (March 29, 2024, Gulu University). This perspective underscored the importance of case scenarios in bridging the gap between academic theories and practical application. They also helped students to relate with the environment around them.

In support of this, recent graduates; G1, G2, G3, G4 and G10 highlighted how case scenarios facilitated the practical application of academic concepts. G10 stated, "Case scenarios provided a practical framework for applying theoretical concepts to real-world problems, which was invaluable in my transition to the professional environment" (January 20, 2024, Gulu University). This feedback reflected the role of case scenarios in preparing students for professional challenges. Similarly, graduate students valued case scenarios for demonstrating the application of theories in practical situations. FGI remarked, "Case scenarios were essential in helping us understand how theoretical concepts played out in real-world situations, bridging the gap between theory and practice" (February 5, 2024, Gulu University). This insight highlighted how case scenarios enhanced students' ability to translate theoretical knowledge into practical skills.

However, despite these positive insights, a review of the teaching guides revealed discrepancies. Contrary to the participants' insights, the teaching guides checked did not provide sufficient evidence of methodology for incorporating case scenarios into lessons. They primarily outlined traditional teaching methods, with minimal reference to case scenarios (March 10, 2024,

Gulu University, Department of Educational Management and Administration). This suggested that the integration of case scenarios might not have been as prevalent or systematically implemented as reported.

4.1.1.2.2 Experiential Learning. Furthermore, many participants' insights into the role of case scenarios aligned with the principles of experiential learning. Experiential learning involved acquiring knowledge and skills through direct experience and reflection on those experiences. Case scenarios served as practical exercises that provided concrete examples and contexts for applying theoretical concepts. They simulated real-world situations, allowing individuals to engage in problem-solving, decision-making, and critical thinking. By working through these scenarios, learners actively participated in the learning process, gained a deeper understanding of how concepts functioned in practice, and developed skills that prepared them for real-life challenges in their professional or personal lives. Building on the practical application, lecturers also emphasized the role of case scenarios in providing experiential learning.

Excerpts from Lecture L3 emphasised the role of case scenarios. For instance, L3 noted, "Case scenarios were used in seminars and workshops to give students hands-on experience with real-world issues, enhancing their problem-solving skills" (February 18, 2024, Gulu University). This observation highlighted the value of case scenarios in offering practical, hands-on learning experiences. Further aligning with this view, recent graduates G6 and G9 reflected on how case scenarios contributed to their practical skills. G9 mentioned, "Engaging with case scenarios during my studies helped me gain practical experience and prepare for real-world challenges in my career" (January 20, 2024, Gulu University). This feedback underscored the effectiveness of case scenarios in preparing students for real-world applications.

4.1.1.2.3 Active Learning. Moreover, participants highlighted how case scenarios promoted active learning. Active learning is an instructional approach that actively involves students in the learning process, requiring them to engage with the material through activities such as discussions, problem-solving, and hands-on projects. For example, L1 explained, "Incorporating case scenarios into assignments encourages students to actively participate and engage in critical discussions, which deepens their understanding of the subject matter" (March 28, 2024, Gulu University). This insight illustrated how case scenarios fostered an interactive learning environment, enhancing students' comprehension and retention by involving them directly in the application of concepts and principles.

Recent graduates G5 and G8 emphasized the interactive nature of learning with case scenarios. G8 stated, "Case scenarios required us to engage in critical discussions and collaborate with classmates, which made learning more interactive and effective" (January 15, 2024, Gulu University). This feedback reflected the role of case scenarios in enhancing student engagement and collaboration.

In conclusion, the insights from lecturers, recent graduates, and graduate students at Gulu University illustrated the diverse benefits of case scenarios in practical application, experiential learning, and active learning. While these insights were largely supported by institutional documents, discrepancies in the teaching guides suggested that the integration of case scenarios might not always have aligned with reported practices. Overall, the findings confirmed the effectiveness of case scenarios in enhancing critical thinking and problem-solving skills.

4.1.1.3 Benefits from Case Scenarios. Case scenarios are widely appreciated for their benefits in enhancing educational outcomes, providing significant advantages across various aspects of the learning experience. Insights from graduates, graduate students, and lecturers offer

a nuanced understanding of these benefits, which are categorized into three key concepts: informed decision-making, cultural competence and empathy, and creative problem-solving skills.

4.1.1.3.1 Informed Decision-Making. Firstly, participants regarded decision-making as a key benefit of case scenarios at Gulu University, highlighting its role in enhancing critical thinking and problem-solving skills. Decision-making involves selecting the best course of action from various alternatives based on an analysis of available information, which is crucial in both personal and professional contexts. Case scenarios provided students with opportunities to practice decision-making by simulating real-world situations that required them to evaluate different options, weigh their pros and cons, and make informed choices.

For instance, recent graduates G1, G2, G3 and G8 recognized the benefits of case scenarios in improving informed decision-making, valuing the practical insights gained from analyzing real-world scenarios. G8 noted, "Case scenarios enabled us to analyze the impact of various educational policies, helping us to better understand their practical implications and effectiveness" (March 1, 2024, Gulu University). This feedback highlighted the benefit of case scenarios in providing a clear perspective on policy issues. Similarly, graduate students valued the practical insights offered by case scenarios for informed decision-making, appreciating how these scenarios allowed them to apply theoretical knowledge to real-world situations.

Lecturer L1 explained, "I incorporated case scenarios into my curriculum to help students analyze and make informed decisions about educational policies and practices" (February 28, 2024, Gulu University). This approach demonstrated how case scenarios supported the development of decision-making skills in an educational context. To corroborate these findings,

minutes from faculty meetings and departmental reviews confirmed that case scenarios were utilized to enhance students' decision-making abilities.

4.1.1.3.2 Cultural Competences. Cultural competence and empathy among students were recognized as significant benefits of using case scenarios. Cultural competence involves interacting effectively with people from diverse backgrounds, while empathy is the ability to understand and share others' feelings. Case scenarios exposed students to various cultural contexts, helping them appreciate different perspectives and approach problems with sensitivity. This exposure prepared them for professional environments where multicultural interactions are common.

For example, recent graduates G4, G5, and G6 highlighted how case scenarios that included diverse perspectives enhanced their cultural competence and empathy. They found these scenarios instrumental in understanding and addressing the needs of various groups. In particular, G4 remarked, "Case scenarios required us to consider diverse viewpoints, which was essential for developing a well-rounded understanding and fostering empathy" (January 22, 2024, Gulu University). The above feedback emphasized the role of case scenarios in promoting inclusivity and cultural awareness. Similarly, graduate students appreciated the inclusion of diverse perspectives in case scenarios, noting that working with scenarios reflecting different cultural contexts helped them better address diverse needs. FGI stated, "Engaging with case scenarios from various cultural backgrounds helped us appreciate the benefits of inclusivity and respond to diverse educational needs" (February 5, 2024, Gulu University).

Furthermore, lecturer L2 recognized the benefit of case scenarios in promoting cultural competence and empathy among students, utilizing scenarios that included diverse perspectives to teach students about inclusivity and cultural sensitivity. L2 mentioned, "We use case scenarios

that reflect different cultural contexts to help students understand and address diverse needs effectively" (March 29, 2024, Gulu University).

4.1.1.3.3 Creative Problem-Solving. Lastly, creative problem-solving skills were also echoed by participants as a benefit from case scenarios. Creative problem-solving skills involve the ability to generate innovative solutions and think outside the box when addressing complex issues. Case scenarios provided opportunities for students to apply these skills by presenting them with realistic problems that required original thinking and integration of diverse information. Through engaging with such scenarios, students learned to develop and refine their problem-solving abilities, which were crucial for tackling real-world challenges effectively.

For example, recent graduates G7, G8, G9 and G10 underscored how case scenarios facilitated the development of creative problem-solving skills. They valued the opportunity to apply theoretical knowledge in innovative ways to tackle complex problems. G7 noted, "Working on interdisciplinary projects through case scenarios helped me to think creatively and synthesize different types of information to solve complex problems" (January 25, 2024, Gulu University). This feedback highlighted the role of case scenarios in encouraging innovative thinking. Similarly, L3 explained, "We design case scenarios that require students to apply their knowledge creatively and develop innovative solutions to real-world problems" (February 28, 2024, Gulu University).

In conclusion, the benefits of case scenarios, as highlighted by graduates, graduate students, and lecturers, included facilitating informed decision-making, promoting cultural competence and empathy, and developing creative problem-solving skills. These findings illustrated the significant impact of case scenarios on various aspects of the educational experience, enhancing both practical and interpersonal skills. Verification from institutional

documents confirmed that Gulu University's educational practices and assignments effectively supported these benefits.

4.1.1.4 Impact of Case Scenarios on Critical Thinking. Various participants including graduates, lecturers and graduate students expressed their insights, their insights were categorized into three concepts questioning assumptions and evaluating evidence, analyzing complex issues and developing creative solutions, and applying theoretical knowledge.

4.1.1.4.1 Questioning Assumptions and Evaluating Evidence. Firstly, questioning assumptions and evaluating evidence was identified as a significant impact of case scenarios on critical thinking. This concept involves critically examining foundational beliefs and the validity of the information presented. Specifically, it requires individuals to challenge preconceived notions and rigorously assess the quality and relevance of evidence before drawing conclusions. This process enhances the ability to engage in reflective thinking and avoid accepting information at face value. For instance, recent graduates G3, G6 and G8 reported that case scenarios significantly contributed to their ability to question assumptions and evaluate evidence. They found these scenarios valuable for pushing them to scrutinize the validity of information and challenge preconceived notions. In particular, G6 remarked, "Case scenarios were instrumental in pushing us to question underlying assumptions and scrutinize the evidence, which enhanced our ability to think critically" (January 2, 2024, Gulu University).

Moreover, graduate students also noted the benefit of case scenarios in developing skills to critically evaluate information and question assumptions. FGI stated, "Engaging with case scenarios required us to critically evaluate information and question assumptions, which improved our analytical skills" (February 5 2024, Gulu University).

Furthermore, lecturer L1 emphasized their use of case scenarios to teach students how to question assumptions and evaluate evidence. L1 explained, "I used case scenarios to teach students how to challenge assumptions and critically assess the evidence presented, which is a key component of developing their critical thinking skills" (February 28, 2024, Gulu University).

4.1.1.4.2 The Complex Issues and Developing Creative Solutions. Secondly, analyzing complex issues and developing creative solutions was recognized as another significant impact of case scenarios on critical thinking. This concept involves breaking down multifaceted problems into manageable components, integrating diverse information, and employing innovative approaches to find effective solutions. Thus, this process is essential for tackling complex challenges and fostering original thinking.

For example, recent graduates G5 and G9recognized the impact of case scenarios in enhancing their ability to analyze complex issues and develop creative solutions. They valued how these scenarios encouraged them to approach intricate problems systematically and think creatively. Particularly, G5 noted, "Case scenarios challenged me to analyze multifaceted issues and encouraged creative problem-solving, which was essential for addressing complex problems" (February 8, 2024, Gulu University).

In addition, lecturer L2 recognized the impact of case scenarios on developing students' abilities to analyze complex issues and find creative solutions. L2 stated, "I designed case scenarios that required students to tackle complex problems and develop creative solutions, which enhances their problem-solving abilities" (March 29, 2024, Gulu University). The verbatim shows the role played by course facilitators in designing case scenarios.

4.1.1.4.3 Theoretical Knowledge. Lastly, applying theoretical knowledge was regarded as another significant impact of case scenarios on critical thinking. Applying theoretical

knowledge refers to the ability to translate academic theories into practical applications. In particular, this process involves using theoretical frameworks to address real-world problems, thereby bridging the gap between academic learning and practical experience. It enhances the ability to apply learned concepts in various scenarios.

For instance, recent graduates G1, G2 and G10 found case scenarios impacted them with valuables for applying theoretical knowledge to practical situations. They appreciated how these scenarios bridged the gap between theory and practice. In particular, G7 noted, "Case scenarios allowed us to apply theoretical concepts in real-world contexts, which reinforced our understanding and practical skills" (January 25, 2024, Gulu University). Similarly, graduate students also valued the practical application of theoretical knowledge through case scenarios.

Moreover, lecturer L3 emphasized the impact of case scenarios in facilitating the application of theoretical knowledge. L3 explained, "I used case scenarios to help students apply theoretical concepts in practical situations, which enhances their understanding and integration of these concepts" (January 18, 2024, Gulu University).

In conclusion, the impact of case scenarios in enhancing critical thinking, as reported by graduates, graduate students, and lecturers, include questioning assumptions and evaluating evidence, analyzing complex issues and developing creative solutions, and applying theoretical knowledge. These findings are supported by institutional documents verifying the integration of case scenarios into Gulu University's educational framework.

4.1.1.5 Critical Thinking Skills in Graduate Students. Participants shared diverse perspectives on the critical thinking skills observed in graduate students. Their feedback was categorized into two key concepts: analytical thinking and evaluation and synthesis.

4.1.1.5.1 Analytical Thinking. Many participants frequently mentioned analytical thinking as a critical skill in graduate students. Analytical thinking involved the ability to systematically break down complex information into smaller, more manageable parts and understand the relationships between them. This skill focused on identifying patterns, connections, and underlying structures to better understand and solve problems.

Recent graduates; G1, G2, G3, G4 and G8 reported that their analytical thinking skills were significantly enhanced, they developed the capacity to deconstruct problems and identify key elements. For instance, G8 remarked, "I can dissect complex problems into smaller parts, my analytical thinking and my ability to comprehend intricate issues has improved" (March 1, 2024, Gulu University). They also noted that the process of breaking down problems into smaller, manageable parts allowed them to better understand and address complex issues.

Similarly, graduate students also highlighted improved their analytical thinking. Specifically, FGI stated, "We have developed analytical thinking to examine each component of a problem in detail" (February 5, 2024, Gulu University). This approach facilitated a deeper understanding of problem components and their relationships. However, Lecturer L1 emphasized their graduate students and graduates exhibits analytical thinking skills. As L1 noted, "Both in the classroom and beyond the classroom, our recent graduates and continuing graduate students continues to apply in their practice, analytical thinking by breaking down complex information and identifying key components" (February 28, 2024, Gulu University). This insight was verified by the minutes from the Department of Educational Management (March 2, 2024), which outlined how analytical tasks were embedded in the curriculum to foster these skills.

4.1.1.5.2 Evaluation and Synthesizing. Participants also indicated that evaluation was a crucial skill, involving the assessment of the credibility, relevance, and significance of

information. It required individuals to weigh evidence, compare alternatives, and make well-supported judgments based on critical assessment. Recent graduates G5 and G6 reported that case scenarios enhanced their evaluative skills by challenging them to assess the validity and relevance of information. As G6 observed, "Case scenarios required us to critically evaluate evidence and make informed decisions, which strengthened our evaluative skills" (January 2, 2024, Gulu University). Furthermore, they noted that t sound judgment and decision-making abilities were exhibited by graduate students.

Lecturer L2 reported evaluation skills in their graduate students, their graduate students can evaluate information effectively. For instance, L2 explained, "In my engagement with graduate students, I witnessed so many of them with the ability to assess evidence and make judgments, which is crucial for their critical thinking" (March 29, 2024, Gulu University). The importance of evaluation tasks in developing critical thinking skills was corroborated by the reports of the Higher Degree Committee (March 8, 2024).

4.1.1.5.3 Synthesis. In addition to analytical thinking and evaluation, many participants also mentioned synthesis as a key skill. Synthesis involved combining various pieces of information to form a coherent and integrated understanding. It required individuals to create connections between different elements and generate new insights or solutions. For instance, recent graduates G7, G9 and G10 reported developed synthesis skills they noted that they integrate diverse information. In particular, G7 noted, "I can combine different pieces of information and develop innovative solutions, enhancing our synthesis abilities" (January 25, 2024, Gulu University). As a result, they were able to generate comprehensive and innovative solutions.

Similarly, lecturer L3 also emphasized the development of synthesis in their students. For example, L3 remarked, "My graduate students can synthesize information and develop creative solutions" (February 18, 2024, Gulu University). This emphasis on synthesis was further supported by the teaching and learning records (March 10, 2024), which detailed how synthesis tasks were included to promote integrated understanding and innovative problem-solving.

In conclusion, the critical thinking skills of analytical thinking, evaluation, and synthesis were significantly promoted through case scenarios, as reported by graduates, graduate students, and lecturers. These skills were crucial for solving complex problems and making informed decisions, and their development was supported by institutional documentation. This collaborative approach between students and educators highlights the importance of practical, scenario-based learning in enhancing critical thinking abilities.

4.1.2 The Role of Academic Collaborations in Fostering Critical Thinking Skills among Graduate Students at Gulu University

Objective two focused on exploring how academic collaborations fostered critical thinking skills among graduate students at Gulu University. This exploration involved examining several key elements: participants' perceptions of academic collaborations, the nature, and structure of these collaborations, the benefits they provided, and the application of critical thinking skills developed through these experiences.

4.1.2.1 Perceptions of Academic Collaborations. Various participants expressed their understanding of academic collaborations in distinct yet overlapping ways. Their insights were organized into three main sub-themes; resource sharing and expertise exchange, scholarly work and knowledge advancement, and interdisciplinary teamwork and intellectual exchange.

4.1.2.1.1 Resource Sharing and Expertise Exchange. Most participants mentioned resource sharing and expertise exchange, which involved the collaborative use of academic resources, including materials, tools, and knowledge, among different individuals or groups. This concept emphasized how pooling resources and expertise could enhance research, learning, and problem-solving capabilities. For instance, lecturer L1 highlighted their perception of academic collaborations by describing collaboration in their academic practices. In particular, L1 explained, "In practical terms, academic collaborations often involved sharing resources such as data, equipment, and academic literature. This not only enhanced the quality of research but also enriched the learning experience for students" (February 28, 2024, Gulu University). This view illustrated that resource sharing was crucial for creating an environment where both students and researchers could benefit from a broader range of resources and knowledge.

Similarly, recent graduates G4, G5 and G5 noted the positive impact of resource sharing and expertise exchange on their professional development. For example, G4 remarked, "During my study, academic collaborations involved having access to shared resources and the opportunity to work with experts from different fields" (January 22, 2024, Gulu University). This observation indicated that resource sharing supported not only academic progress but also prepared graduates for collaborative work environments. Furthermore, graduate students reported that these exchanges were integral to their academic experiences. FGI noted, "The collaboration with other departments allowed us to access diverse resources and gain insights from experts in various fields, which greatly improved the quality of our research" (February 5, 2024, Gulu University). This access to a wider range of tools and knowledge facilitated more comprehensive research outcomes.

4.1.2.1.1 Scholarly Work and Knowledge Advancement. Moving on to scholarly work and knowledge advancement, this concept involved collaborative efforts aimed at generating

new knowledge and contributing to academic fields. It focused on how collaborative research and academic projects drove progress and innovation across various disciplines. Lecturer L2 emphasized the role of this collaboration in advancing knowledge. L2 stated, " I look at academic collaborations as engaging in collaborative research projects allowed to contribute to the academic field, generate new insights, and push the boundaries of current knowledge" (March 29, 2024, Gulu University). This highlighted that such collaborations were essential for producing impactful research and fostering intellectual growth.

Similarly, recent graduates G1, G2, G3 and G6 recognized academic collaborations by the benefits of participating in scholarly collaborations. G6 observed, "Collaborating on research projects during my study is what informed my understanding of academic collaboration. This helped me to contribute to significant advancements in my field. These experiences were instrumental in shaping my career and expanding my professional expertise" (February 2, 2024, Gulu University). This underscored the value of collaborative scholarly work in achieving career development and knowledge creation.

4.1.2.1.2 Interdisciplinary Teamwork and Intellectual Exchange. In addition, interdisciplinary teamwork and intellectual exchange involved collaborating across different academic disciplines to integrate diverse perspectives and solve complex problems. This concept highlighted how bringing together various fields of expertise could lead to innovative solutions and a deeper understanding of multifaceted issues. Lecturer L3 underscored the benefits of interdisciplinary teamwork in their un perception of academic collaborations. For example, L3 noted, "I observed academic collaborations as interdisciplinary and thus, I encouraged interdisciplinary projects because they brought together different perspectives and expertise, which helped students develop a more holistic view of complex problems" (February 18, 2024,

Gulu University). They emphasized that such teamwork was crucial for fostering innovative thinking and comprehensive problem-solving skills.

Similarly, recent graduates G5, G8 and G9 found interdisciplinary teamwork to be highly beneficial for their professional development and regarded it as aspects of academic collaborations For instance, G8 remarked, " I look at academic collaborations as collaborating with professionals from different disciplines, during my study it provided me with a broader perspective and better problem-solving skills, which have been valuable in my career" (March 1, 2024, Gulu University). This indicated that graduates refer to academic collaborations as interdisciplinary work that enhanced both academic and professional capabilities. Participants' perspectives were corroborated by institutional documents. For instance, the Faculty Board Meeting minutes (February 22, 2024) highlighted the strategic emphasis on interdisciplinary projects to enhance academic outcomes. Additionally, teaching and learning records (March 10, 2024, Head of Department Office) detailed how collaborative and interdisciplinary approaches were incorporated into the curriculum to support academic and professional growth.

In conclusion, the perceptions of academic collaborations at Gulu University were characterized by resource sharing and expertise exchange, scholarly work and knowledge advancement, and interdisciplinary teamwork and intellectual exchange. Insights from lecturers, graduates, and graduate students, supported by institutional documentation, underscored the multifaceted benefits of these collaborations in enhancing academic and professional outcomes.

4.1.2.2 Nature of Academic Collaborations. Various participants including graduates, graduate students, and lecturers, offered insights into the nature of academic collaborations at Gulu University. Their insights were categorized into three key themes: resource sharing and

expertise exchange, scholarly work and knowledge advancement, and interdisciplinary teamwork and intellectual exchange.

4.1.2.2.1 Resource Sharing and Expertise Exchange. Participants mentioned resource sharing and expertise exchange, which involved the collaborative use and distribution of academic resources, including materials, tools, and knowledge. This concept emphasized the benefits of pooling resources and knowledge from different sources to enhance research and learning outcomes. For example, recent graduates G4, G5, G7 and G8 highlighted the importance of resource sharing and expertise exchange in their professional lives. G4 observed, "Collaborating with colleagues from different disciplines and having access to a wide range of resources has been invaluable in my career. It has helped me address complex problems and advance in my field" (January 22, 2024, Gulu University). This indicated that the benefits of resource sharing extended beyond academic settings into professional environments and comprised the critical elements of academic collaborations.

Lecturer L1 emphasized the use of resource sharing in enhancing teaching and research in understanding the nature of academic collaborations. In particular, L1 noted, "I encouraged collaborations that involved sharing academic resources and expertise to provide students with a richer learning experience. This approach helped in developing a more comprehensive understanding of the subject matter" (February 28, 2024, Gulu University). Institutional documents, such as the Teaching and Learning Records (March 15, 2024), supported this view by detailing how resource sharing was integrated into academic programs.

In addition, participants mentioned scholarly work and knowledge advancement, which involved collaborative efforts aimed at advancing academic research and generating new knowledge. This concept highlighted how collaborative projects contributed to the progression of

academic disciplines and the creation of new insights. Graduate students recognized that engaging in collaborative scholarly work significantly advanced their knowledge. FGI stated, "Collaborative research projects provided us with opportunities to contribute to new knowledge and gain deeper insights into our fields of study" (February 5, 2024, Gulu University). They emphasized collaborative projects in the nature of academic collaborations, these collaborations facilitated their involvement in cutting-edge research and academic discourse.

Similarly, recent graduates G2, G6 and G10 noted the impact of scholarly collaborations on their professional growth in their understanding of scholarly collaborations. For instance, G6 commented, "Collaborating on research projects not only advanced my knowledge but also allowed me to contribute to significant developments in my field. These experiences were crucial for my career advancement" (January 2, 2024, Gulu University). This underscored the relevance of collaborative scholarly work in both academic and professional contexts and informed their understanding of the nature of academic collaborations.

Moreover, lecturer L2 highlighted the nature of scholarly work in their teaching and research. For example, L2 explained, "I actively engaged in and promoted collaborative research to advance knowledge and contribute to academic literature. This involvement helped graduate students understand to understand the nature of academic collaborations and the importance of contributing to their fields through this platform" (March 29, 2024, Gulu University).

4.1.2.2.2 Interdisciplinary Teamwork and Intellectual Exchange. Many participants indicated that interdisciplinary teamwork and intellectual exchange involved collaborating across different academic disciplines to foster diverse perspectives and innovative solutions. This concept emphasized the nature academic collaborations in integrating knowledge from various fields to address complex issues. For example, recent graduates G1,G3 and G9 valued

interdisciplinary teamwork in their careers. G9 remarked, "Interdisciplinary collaborations during my study provided me with a well-rounded perspective on complex issues, which has been incredibly useful in my professional work" (January 20, 2024, Gulu University). This highlighted the long-term nature of interdisciplinary collaboration for career development. Lecturer L3 stressed the importance of academic collaborations as interdisciplinary teamwork with positive impact in their academic programs. Similarly, lecturer L3 noted the interdisciplinary nature of academic collaborations. As L3 noted, "I designed projects that required students to collaborate across disciplines to enhance their ability to integrate diverse viewpoints and solve complex problems" (February 18, 2024, Gulu University). This approach was supported by faculty meeting minutes (February 22, 2024), which outlined the strategic emphasis on interdisciplinary collaboration in curriculum design as key components of academic collaborations.

In conclusion, the nature of academic collaborations at Gulu University was characterized by resource sharing and expertise exchange, scholarly work and knowledge advancement, and interdisciplinary teamwork and intellectual exchange. Insights from graduate students, graduates, and lecturers, supported by institutional documentation, highlighted the diverse benefits of these collaborations in enhancing academic and professional outcomes.

4.1.2.3 Benefits from Academic Collaborations. Participants, including graduates, graduate students, and lecturers, provided valuable insights into the benefits derived from academic collaborations. These insights were categorized into two key concepts: partnerships between different academic disciplines or departments and cooperation and communication.

4.1.2.3.1 Partnership between different Academic Disciplines or Departments. Firstly, participants mentioned enhanced partnerships between different academic disciplines or

departments. This involved collaborative efforts where individuals or groups from various academic fields or departments worked together to achieve common goals. Recent graduates G4 and G6 identified several benefits from such partnerships. G4 highlighted, "Collaborating with peers from different disciplines helped me understand complex issues from various perspectives, leading to more comprehensive and innovative solutions" (February 22, 2024, Gulu University). This indicated that interdisciplinary partnerships were valuable for addressing multifaceted problems and fostering creative problem-solving skills.

Similarly, graduate students reported that partnerships with other departments provided them with access to diverse resources and expertise. FGI noted, "Working with other departments allowed us to leverage their specialized knowledge and resources, which significantly enriched our research and academic experience" (February 5, 2024, Gulu University). This access to a broader range of resources and expertise enhanced the overall quality of academic work. Lecturer L2 also emphasized the benefits of these partnerships. L2 observed, "Interdisciplinary collaborations often resulted in more robust research outcomes and offered graduate students a broader perspective on their studies" (March 29, 2024, Gulu University). Institutional documents, such as the minutes of faculty board meeting (March 15, 2024), supported this view by detailing successful interdisciplinary projects and their positive impact on research outcomes.

4.1.2.3.2 Cooperation and Communication. Participants also highlighted the benefits of cooperation and communication. This concept involved effective teamwork, sharing ideas, and collaborating towards shared objectives. Recent graduates; G1, G2, G3 and G7 experienced several advantages from cooperative efforts. G7 noted, "Effective communication and cooperation with my peers and mentors enhanced the quality of our collaborative projects and fostered a supportive academic environment" (January 25, 2024, Gulu University). This

highlighted the importance of clear communication and teamwork in achieving successful collaborative outcomes.

Additionally, recent graduates; G5, G8, G9 and G10 emphasized that cooperation and communication improved their overall academic experience. G5 commented, "Collaborative efforts that involved open communication and teamwork significantly enhanced my learning experience and helped me develop essential skills for my future career" (February 8, 2024, Gulu University). While Lecturer L1 also observed the positive effects of cooperation and communication on student development. L1 stated, "Encouraging open dialogue and collaborative work among students helped them develop critical thinking and problem-solving skills, which are essential for their academic and professional growth" (March 28, 2024, Gulu University). The benefits from cooperation and communication were further supported by teaching and learning records (March 10, 2024), which detailed the integration of collaborative activities into the curriculum.

In conclusion, the benefits derived from academic collaborations at Gulu University included partnerships between different academic disciplines or departments and effective cooperation and communication. Insights from graduates, graduate students, and lecturers, supported by institutional documentation, highlighted the significant positive impact of these collaborations on academic and professional outcomes.

4.1.2.4 Impact of Academic Collaborations on Critical Thinking. Academic collaborations played a pivotal role in fostering critical thinking among participants, including graduates, graduate students, and lecturers. Through their experiences, participants offered valuable insights into how collaborations enhanced critical thinking skills. These insights were

organized into three sub-themes: interdisciplinary collaboration, cooperation and communication, and applied research and problem-solving.

4.1.2.4.1 Interdisciplinary Collaboration. Many participants mentioned interdisciplinary collaboration as impact of academic collaborations, which involved working across different academic disciplines to address complex problems. This type of collaboration encouraged participants to integrate diverse perspectives and methodologies, thus fostering a more comprehensive approach to problem-solving. For example, graduate students reported that interdisciplinary collaboration significantly enriched their critical thinking skills. They noted that engaging with peers from various fields allowed them to see problems from multiple angles. In particular, FGI stated, "Collaborating with students from different disciplines provided us with new insights and approaches that deepened our understanding and enhanced our critical thinking" (February 5, 2024, Gulu University).

Consequently, recent graduates G5, G6 and G7 also highlighted the impact of interdisciplinary collaboration, albeit with a different focus. For instance, G5 remarked, "Working with professionals from different backgrounds helped me develop a more detailed perspective on complex issues, which was crucial for critical thinking in my career" (February 8, 2024, Gulu University). Similarly, lecturer L1 stressed the importance of interdisciplinary collaboration in their teaching approaches. L1 explained, "We designed collaborative projects that brought together different academic perspectives, which challenged students to think critically and integrate diverse viewpoints" (February 28, 2024, Gulu University). This emphasis on interdisciplinary collaboration was corroborated by the minutes from the faculty board meeting (February 28, 2024), which outlined the role of interdisciplinary projects in enhancing critical thinking skills.

4.1.2.4.2 Cooperation and Communication. Many participants also regarded cooperation and communication as vital components that involved working effectively with others and sharing information clearly to achieve common goals. This concept highlighted the importance of teamwork and clear dialogue in fostering critical thinking. For instance, recent graduates G3, G8 and G10 echoed this sentiment, emphasizing that effective communication and cooperation were vital in their professional roles. G3 commented, "The teamwork skills we developed during our studies have been invaluable in my career, where effective communication and cooperation are essential for successful project execution" (February 20, 2024, Gulu University). This perspective was supported by the reports of the higher degree committee (March 8, 2024), which highlighted the importance of communication and collaboration in academic and professional contexts.

Furthermore, lecturer L2 also emphasized the impact of cooperation and communication in their teaching. L2 stated, "I used group assignments and collaborative activities to help students develop strong communication and teamwork skills, which were crucial for effective problem-solving" (March 29, 2024, Gulu University). This approach was reinforced by the teaching and learning records (March 10, 2024), which detailed how communication and collaboration exercises were incorporated into the curriculum to enhance critical thinking.

4.1.2.4.3 Applied Research and Problem-Solving. Additionally, many participants mentioned applied research and problem-solving, which involved using research findings to address real-world issues and develop practical solutions. This concept underscored the importance of applying theoretical knowledge to solve practical problems and enhance critical thinking. Recent graduate G1, G2, G3, G4 and G9 students noted that applied research projects were instrumental in developing their problem-solving skills. For example, G9 reported, "Engaging in applied research allowed us to test theories in real-world scenarios, which

sharpened our problem-solving abilities and critical thinking" (January 20, 2024, Gulu University).

Similarly, L3 explained, "I designed assignments that required students to apply their research to solve real-world problems, which enhanced their critical thinking and problem-solving skills" (February 18, 2024, Gulu University). The integration of applied research into coursework was confirmed by the teaching and learning records (March 10, 2024, Head of Department Office), which detailed how these projects contributed to developing critical thinking skills.

In summary, the impact of academic collaborations on critical thinking was evident across various participant groups. Interdisciplinary collaboration, cooperation and communication, and applied research and problem-solving emerged as key concepts that significantly enhanced critical thinking skills. The insights provided by graduate students, graduates, and lecturers, supported by institutional documentation, underscored the value of these collaborations in fostering critical thinking. These findings highlighted the importance of incorporating collaborative approaches into academic programs to develop well-rounded and critically adept graduates.

4.1.2.5 Critical Thinking Skills in Graduate Students. Many graduate students were expected to develop and demonstrate strong critical thinking skills throughout their academic journey. Participants, including lecturers, graduates, and the graduate students themselves, offered insights into the critical thinking skills observed in these students. Three key skills emerged from the discussions: problem-solving and analytical reasoning, communication and collaboration, and adaptability and flexibility. Additionally, differing views on these skills were

examined, and verification from institutional documents was conducted to ensure a comprehensive understanding.

4.1.2.5.1 Problem-solving and Analytical Reasoning Skills. Firstly, many participants mentioned that problem-solving and analytical reasoning were essential skills that enabled students to approach complex issues methodically and logically. These skills involved the ability to break down problems into smaller components, analyze data and information critically, identify patterns, and develop effective solutions. Analytical reasoning allowed students to make connections between different pieces of information, leading to a deeper understanding of the subject matter. For example, graduate students emphasized the importance of problem-solving and analytical reasoning in their studies. They reported that case studies and practical assignments played a significant role in developing these skills. In particular, FGI stated, "We developed problem solving and analytical skills. Working on complex case studies allowed us to apply theoretical knowledge to real-world problems, enhancing our problem-solving abilities" (February 5, 2024, Gulu University).

Furthermore, recent graduates G2, G4, G5, G7 and G10 reflected on how their time as students helped them build strong analytical reasoning skills, which they now applied in their professional lives. In particular, G10 noted, "The analytical tasks I undertook during our study were instrumental in preparing me for the challenges I face in the workplace. I have faced several work related challenges including conflict in school management within the subcounty that I work as inspector of schools, however, I have management to solve these problems, most importantly by applying the conflict Management strategies I learnt during my study among others" (January 15, 2024, Gulu University). Similarly, lecturer L1 emphasized their role in facilitating the development of problem-solving skills in graduate students. For instance, L1 explained, "I designed coursework to challenge students' analytical abilities and encourage them

to think critically about complex problems" (February 28, 2024, Gulu University). Lecturers noted that structured problem-solving exercises were integral to the curriculum, allowing students to practice and enhance their analytical skills through guided learning.

4.1.2.5.2 Communication and Collaboration Skills. In addition, many participants mentioned that communication and collaboration were crucial skills that enabled students to effectively share ideas, work in teams, and contribute to collective problem-solving. Strong communication skills involved the ability to articulate thoughts clearly and persuasively, while collaboration involved working effectively with others to achieve common goals. These skills were essential for success in both academic and professional environments, where teamwork and clear communication were often key to achieving results. For example, recent graduates G2, G6 and G8 echoed the importance of communication and collaboration, noting that these skills were vital in their current professional roles. In particular, G2 commented, "The ability to communicate effectively and collaborate with others is crucial in any work environment, and our academic experiences prepared us well for this" (March 30, 2024, Gulu University). They highlighted how the teamwork experiences during their studies translated into effective workplace interactions.

Moreover, lecturer L2 stressed the need to foster communication skills in graduate students. For instance, L2 stated, "I encouraged students to engage in discussions and group work to enhance their communication and collaboration skills" (March 29, 2024, Gulu University). Lecturers also highlighted the skill of presentations in developing these abilities, emphasizing the importance of these skills in academic success and future careers.

4.1.2.5.3 Adaptability and Flexibility Skills. Finally, participants regarded adaptability and flexibility as vital skills that enabled students to navigate changing circumstances and new

challenges with ease. These skills involved the ability to adjust one's approach in response to new information, unexpected obstacles, or evolving situations. In a rapidly changing world, adaptability and flexibility were crucial for both academic success and career advancement, as they allowed individuals to thrive in dynamic environments. For instance, recent graduates G1, G3 and G9 aemphasized the significance of adaptability in their professional careers. For example, G3 mentioned, "The ability to adapt to new situations and challenges is something we honed during our graduate studies, and it's invaluable in the workplace" (February 20, 2024, Gulu University). They highlighted the need for continuous learning and adaptation, which were essential in today's fast-paced work environments.

Similarly, lecturer L3 pointed out that adaptability and flexibility were key competencies they aimed to develop in students. For example, L3 explained, "I designed the curriculum to expose students to diverse scenarios that required them to be adaptable and flexible in their thinking" (February 18, 2024, Gulu University). This approach ensured that students were well-prepared to handle the uncertainties and complexities of real-world situations. Verification with teaching and learning records revealed that these skills were integrated into the academic programs to prepare students for future challenges. These records provided evidence of the institution's commitment to developing well-rounded graduates who could thrive in various environments.

In conclusion, the development of critical thinking skills in graduate students, including problem-solving and analytical reasoning, communication and collaboration, and adaptability and flexibility, was widely recognized by participants. The insights gathered from graduate students, graduates, and lecturers, supported by institutional documentation, underscored the significance of these skills in both academic and professional contexts. These findings

highlighted the need for a comprehensive approach to fostering critical thinking in graduate education.

4.1.3 The Role of Guided Facilitations in Promoting Critical Thinking Skills among Graduate Students at Gulu University

Objective three aimed to explore how guided facilitations enhanced critical thinking skills among graduate students at Gulu University. This exploration addressed the research question: How did guided facilitations promote critical thinking skills among graduate students at Gulu University? The examination focused on several key elements: participants' perceptions of guided facilitations, examples of guided facilitations, the impact of guided facilitation on critical thinking, and critical thinking in graduate students. Below, we detail the findings related to these elements:

4.1.3.1 Perceptions of Guided Facilitations. Guided facilitations were perceived as an effective pedagogical approach to promoting critical thinking skills by various participants, including graduates, graduate students, and lecturers. These perceptions were categorized into three key areas: description and understanding, purpose and strategies, and encouraging participation and critical thinking.

4.1.3.1.1 Description and Understanding. Participants mentioned description and understanding in their understanding of guided facilitation, which involved clearly outlining and objectively presenting the facts of a topic (description) and then interpreting these details to uncover deeper meanings and connections (understanding). For example, graduate students described guided facilitations as structured sessions led by facilitators who helped them navigate complex topics by breaking them down into understandable parts. They appreciated the facilitators’ ability to clarify intricate theories and encourage deeper engagement with the

material. This approach helped them develop a clearer understanding of the subject matter. For example, FGI stated, " The guided facilitations helped us break down complex theories into understandable parts, allowing us to analyze and discuss them critically, we were involved in framework of what is and what is not and essentially who is for, providing different interpretations and common links" (March 5, 2024, Gulu University).

Recent graduates G1, G2 and G7 reflected on how guided facilitations provided a clear framework for exploring challenging subjects during their studies. They highlighted the role of facilitators in steering discussions and offering insights that enriched their learning experience. Many graduates reported that this structured approach was crucial in helping them grasp difficult concepts and think more critically about the subject matter. G7, for instance, noted, "Guided facilitations were crucial in helping us understand difficult concepts and encouraged us to think more critically about the subject matter, I was involved in discussions that encompasses more than just guiding discussions but one which created and environment that respects all contributions, fosters ownership, and unlocks potentials." (January 25, 2024, Gulu University).

Lecturer L1 described guided facilitations as an instructional method where they acted as facilitators rather than traditional lecturers. They emphasized the importance of creating an environment where students could freely explore ideas, ask questions, and develop their critical thinking skills. L1 explained, "As a facilitator, I aimed to guide students through the learning process, encouraging them to engage with the material actively and think critically" (February 28, 2024, Gulu University). This approach was seen as vital in shifting the focus from rote learning to a more interactive and thought-provoking process.

4.1.3.1.2 Purpose and Strategies. Participants also mentioned purpose and strategies, which involved defining the educational goals of guided facilitation (purpose) and employing

various methods and techniques, such as prompting questions and structured discussions, to effectively achieve these goals and enhance learning outcomes (strategies). Recent graduate G8, G6, G5, and G4 identified the purpose of guided facilitations as equipping them with the skills needed to analyze and evaluate information critically. They recalled how facilitators used various strategies to engage them, including role-playing, debates, and problem-solving exercises. G8 reflected, "Our facilitators used innovative strategies to challenge our thinking and encourage us to explore different perspectives" (March 1, 2024, Gulu University). These strategies were seen as essential in helping them develop the ability to assess and integrate diverse viewpoints.

Lecturer L2 viewed guided facilitations as a means to achieve learning objectives by promoting critical thinking and active learning. They discussed strategies such as collaborative learning, Socratic questioning, and reflective exercises to encourage students to think critically and independently. L2 explained, "I particularly, designed facilitation strategies that encouraged students to question assumptions, analyze arguments, and develop their critical thinking skills" (March 29, 2024, Gulu University). These strategies aimed to cultivate an environment of inquiry and analysis, moving beyond passive reception of information.

Participants stated that encouraging participation and critical thinking involved creating an inclusive environment where everyone felt comfortable sharing their ideas and perspectives (encouraging participation) and using techniques to stimulate analytical thinking, challenge assumptions, and explore different viewpoints (critical thinking). For example, recent graduate G9 and G10 highlighted how guided facilitations encouraged active participation and collaboration among students. They recalled how facilitators encouraged them to ask questions, share insights, and engage in critical dialogues, leading to a deeper understanding of the material. G9 mentioned, "The interactive nature of guided facilitations allowed us to learn from each other and think critically about complex issues" (January 20, 2024, Gulu University). This

collaborative approach was seen as vital in developing a community of inquiry and fostering a deeper appreciation for different perspectives.

4.1.3.1.3 Participation and Critical Thinking. Lecturers underscored the perception of guided facilitations in promoting student participation and critical thinking. They described how they encouraged students to take an active role in the learning process, facilitating discussions that challenged students to think critically and creatively. L3 stated, "Our goal was to foster an environment where students felt comfortable expressing their ideas and engaging in critical discussions" (February 18, 2024, Gulu University). This approach aimed to empower students to take ownership of their learning and engage actively with the content and their peers.

The perceptions of guided facilitations among graduates, graduate students, and lecturers highlighted the significant impact of this approach on promoting critical thinking skills. Participants recognized the importance of guided facilitations in providing structured learning experiences, fostering a deeper understanding of complex topics, and encouraging active participation and critical thinking. The insights gathered from various participant groups underscored the value of guided facilitations in developing well-rounded and critically adept graduates, emphasizing the need to incorporate this approach into academic programs.

4.1.3.2 Nature of Guided Facilitations. Participants, including graduates, graduate students, and lecturers, provided valuable insights into the nature of guided facilitations, which were categorized into two key concepts: learner-centered learning environment and participant engagement.

4.1.3.2.1 Learner-Centered Learning. Many participants mentioned a learner-centered learning environment, which involved designing educational experiences that prioritized the needs, interests, and active engagement of learners. This approach included tailoring instruction

to individual learning styles, fostering autonomy and self-directed learning, and encouraging interactive and collaborative activities that empowered students to take an active role in their own learning process. Recent graduate students highlighted the importance of a learner-centered environment in facilitating their learning process. They appreciated how guided facilitations allowed them to take charge of their learning journey, enabling them to explore topics more deeply and at their own pace. They emphasized that this approach shifted the focus from passive reception of information to active participation and critical analysis. As FGI noted, "Guided facilitations placed us at the center of our learning, allowing us to explore topics that interested us and delve deeper into complex issues" (February 5, 2024, Gulu University). This empowered them to engage more thoroughly with the material, developing skills necessary for lifelong learning.

Recent graduate G4 and G6 reflected on the learner-centered nature of guided facilitations during their studies and how it encouraged autonomy and self-directed learning. They noted that facilitators acted more as guides than traditional lecturers, allowing them to pursue their interests within the curriculum. This approach helped them develop a sense of ownership over their education. G4 stated, "The learner-centered environment in guided facilitations helped us become more independent learners and encouraged us to think critically about the material" (January 22, 2024, Gulu University). The graduates appreciated the freedom to explore diverse perspectives and learn from their peers, which was crucial in preparing them for real-world challenges.

Lecturer L2 emphasized the creating a learner-centered environment in guided facilitations. They described how they designed activities and discussions that placed students at the center of the learning process, encouraging them to ask questions, challenge assumptions, and engage in critical thinking. L2 explained, "Our role as facilitators was to create a learning

environment where students felt empowered to take control of their learning and explore topics that sparked their curiosity" (March 29, 2024, Gulu University). This approach aimed to foster independence and critical inquiry, preparing students to become self-reliant learners and critical thinkers.

Participant engagement was also stated by participants as another crucial aspect of guided facilitations. It involved actively involving students in discussions, encouraging them to share their perspectives, and fostering collaboration among peers. This engagement was key to developing critical thinking skills and a deeper understanding of the material. Graduate students highlighted the role of participant engagement in enhancing their learning experiences during guided facilitations. They noted that these sessions encouraged them to actively participate in discussions, share their insights, and learn from their peers.

4.1.3.2.2 Participant Engagement. Participants reflected on how participant's engagement during guided facilitations contributed to their overall learning experience. They appreciated the interactive nature of these sessions, which allowed them to engage in meaningful discussions and collaborate with classmates. Recent graduate G9 stated, "The active participation encouraged in guided facilitations helped us develop critical thinking skills by allowing us to engage with diverse perspectives and collaborate on problem-solving" (January 20, 2024, Gulu University). This engagement not only enhanced their understanding of the material but also prepared them for teamwork and collaboration in their future careers.

Lecturer L3 emphasized the participant engagement in guided facilitations as a means of promoting critical thinking. They described how they used various techniques to engage students, such as group discussions, debates, and interactive activities. L3 noted, "Engagement is at the heart of guided facilitations, and we strive to create an environment where students feel

motivated to participate actively and contribute to discussions" (February 18, 2024, Gulu University). This engagement was seen as a catalyst for developing students' ability to think critically and creatively, as well as fostering a sense of community within the classroom.

The insights provided by graduates, graduate students, and lecturers regarding the nature of guided facilitations highlighted the effectiveness of this approach in creating a learner-centered learning environment and promoting participant engagement. These concepts were integral to developing critical thinking skills and preparing students for academic and professional success. By prioritizing student-centered learning and active participation, guided facilitations contributed to the development of well-rounded and critically adept graduates, emphasizing the need for their incorporation into academic programs.

4.1.3.3 Benefits from Guided Facilitations. Participants, including graduates, graduate students, and lecturers, offered valuable insights into the specific benefits derived from guided facilitation. These benefits were categorized into three key concepts: implementation techniques, practical examples, and application in various course activities.

4.1.3.3.1 Implementation Techniques. Participants referred to implementation techniques, as a process involving practical methods and approaches used to effectively apply guided facilitation strategies in educational settings. This included structuring lessons, using interactive tools and activities, providing timely feedback, and adapting teaching methods to meet the diverse needs of learners. Implementation techniques ensured that the facilitation process was engaging, supported learning objectives, and promoted active participation and critical thinking. Graduate students found that guided facilitation’s implementation techniques significantly enhanced their critical thinking skills. They reported appreciating methods such as structured discussions, Socratic questioning, and case studies. FGI noted, "The implementation

of Socratic questioning and structured discussions in guided facilitation helped us engage deeply with complex concepts and encouraged critical analysis" (February 5, 2024, Gulu University). These techniques provided clear frameworks for exploring difficult topics and fostered a more interactive learning environment.

Recent graduates G4, G5 and G7 highlighted specific implementation techniques that they found beneficial. They pointed out that techniques like collaborative projects, peer reviews, and feedback sessions were particularly effective. G7 remarked, "Collaborative projects and peer reviews facilitated a deeper understanding of the material and encouraged us to think critically by evaluating different perspectives" (January 25, 2024, Gulu University). These methods not only enhanced their analytical skills but also improved their ability to engage in constructive dialogues.

Lecturer L2 described various implementation techniques used during guided facilitation. They emphasized the value of interactive discussions, problem-based learning, and feedback mechanisms. L2 explained, "We employed problem-based learning and interactive discussions to stimulate critical thinking and help students approach problems from various perspectives" (March 29 2024, Gulu University). These techniques were aimed at creating a dynamic learning environment that challenged students to think critically and engage with complex issues.

4.1.3.3.2 Practical Application. Many participants mentioned practical application, which involved translating theoretical concepts into real-world scenarios and exercises. This included using case studies, simulations, and hands-on activities to allow learners to apply knowledge and skills in practical contexts, thereby enhancing their understanding and ability to solve actual problems. Practical application bridged the gap between theory and practice, making learning more relevant and actionable.

Recent graduates G1, G2, G3 and G5 reflected on practical examples from their guided facilitation experiences. They highlighted role-playing exercises, simulations, and research projects as key activities that reinforced their critical thinking. For instance, G5 noted, "Role-playing exercises and simulations provided a practical context for applying theories, which sharpened our analytical skills and enhanced our ability to think critically about complex issues" (February 8, 2024, Gulu University). These practical examples demonstrated how guided facilitation activities bridged the gap between theory and practice.

Lecturer L3 offered practical examples of how guided facilitation was implemented in their teaching. They described using case studies, group projects, and reflective exercises to promote critical thinking. L3 explained, "We used case studies and group projects to provide students with opportunities to tackle real-world problems, encouraging them to apply their knowledge critically" (February 18, 2024, Gulu University). These examples highlighted the effectiveness of guided facilitation in creating practical learning experiences that enhanced students' critical thinking skills.

4.1.3.3.3 Application in Various Courses. Participants also revealed application in various course activities, which involved integrating and using learned concepts and skills across different types of assignments and projects. This included incorporating practical exercises, problem-solving tasks, group discussions, and real-world scenarios within the curriculum to reinforce learning and demonstrate the relevance of theoretical knowledge in diverse contexts. This approach helped students see the practical utility of what they had learned and supported the development of a more comprehensive understanding.

Graduates G8 and G10 highlighted how guided facilitation was applied in diverse course activities and its impact on their learning. They appreciated its use in assignments, presentations,

and collaborative projects. G8 remarked, "Incorporating guided facilitation into assignments and presentations allowed us to approach problems from different angles and develop a deeper understanding of the subject matter" (March 1, 2024, Gulu University). This application underscored the versatility of guided facilitation in various academic settings.

Lecturer L1 described how guided facilitation was embedded in various course activities to enhance learning outcomes. They highlighted its role in enhancing lectures, workshops, and group discussions. L1 stated, "We incorporated guided facilitation techniques in lectures and workshops to create a more interactive and student-centered learning environment" (February 28, 2024, Gulu University). This application emphasized the importance of guided facilitation in enriching different aspects of the educational experience.

In summary, the benefits derived from guided facilitation were evident across implementation techniques, practical examples, and application in various course activities. Participants from all groups recognized the value of guided facilitation in promoting critical thinking, enhancing learning experiences, and bridging theoretical knowledge with practical application.

4.1.3.4 Impact of guided facilitations on Critical Thinking. The impact of guided facilitation on critical thinking skills in graduate students was explored through the perceptions of graduates, graduate students, and lecturers. The findings were categorized into three key areas: structured discussions, reflective activities, and collaborative learning. Each concept and its impact are detailed below:

4.1.3.4.1 Structured Discussions. Structured discussions involved organized and purposeful dialogue facilitated by an instructor to promote deeper understanding and critical

thinking. These discussions were designed to explore complex topics through guided questioning, debate, and analysis, encouraging participants to engage with the material critically.

Graduate students appreciated structured discussions for their role in enhancing critical thinking. They reported that these discussions provided a framework for analyzing and debating complex concepts. However, FGI noted, "Structured discussions during guided facilitation helped us dissect intricate theories and encouraged us to question and analyze different viewpoints" (February 5, 2024, Gulu University). This approach enabled them to engage critically with the content and develop a nuanced understanding.

Recent graduates G1, G6, G7, G8 and G10 reflected positively on the impact of structured discussions from their experiences. They highlighted how these discussions sharpened their analytical skills and improved their ability to argue and reason effectively. G6 mentioned, "The structured discussions we participated in during our studies fostered critical thinking by challenging us to articulate and defend our perspectives" (February 2, 2024, Gulu University). This feedback indicated that structured discussions were effective in developing critical reasoning skills.

Lecturer L2 emphasized the importance of structured discussions in their teaching. They used these discussions to facilitate deeper engagement with the material and stimulate critical analysis. L2 explained, "We designed structured discussions to guide students through complex issues, encouraging them to critically assess different arguments and viewpoints" (March 29, 2024, Gulu University). This approach helped students develop critical thinking skills by providing them with a platform to explore and debate challenging concepts.

4.1.3.4.2 Reflective Activities. Reflective activities involved exercises that encouraged participants to think deeply about their learning experiences and the application of their

knowledge. These activities included journaling, self-assessment, and reflective essays, designed to foster self-awareness and critical analysis of one's understanding and learning process.

Recent graduates G3, G4, G5, G6 and G9 acknowledged the benefits of reflective activities in their academic and professional development. They noted that these activities helped them critically evaluate their understanding and improve their problem-solving skills. G9 stated, "Reflective exercises were instrumental in helping us assess our strengths and areas for improvement, enhancing our critical thinking and analytical abilities" (March 1, 2024, Gulu University). This feedback underscored the value of reflective activities in promoting critical self-evaluation and continuous learning.

Lecturer L3 observed that reflective activities played a significant role in developing students' critical thinking skills. They incorporated these activities to encourage students to think deeply about their learning experiences and the implications of their knowledge. L3 noted, "We used reflective activities to prompt students to analyze their learning processes and outcomes, which facilitated a deeper level of critical thinking" (February 18, 2024, Gulu University). This approach helped students engage in meaningful self-assessment and critical reflection.

4.1.3.4.3 Collaborative Learning. Collaborative learning involved group-based activities where participants worked together to solve problems, complete projects, or engage in discussions. This approach fostered critical thinking by exposing students to diverse perspectives, encouraging teamwork, and facilitating collective problem-solving.

Recent graduates G2 highlighted the benefits of collaborative learning in their studies. They reported that group projects and teamwork improved their ability to think critically and approach problems from multiple angles. G2 commented, "Working on group projects exposed us to different perspectives and helped us develop a more comprehensive approach to problem-

solving" (March 30, 2024, Gulu University). This reflection indicated that collaborative learning was effective in enhancing their critical thinking and teamwork skills.

Lecturer L1 underscored the importance of collaborative learning in fostering critical thinking. They utilized group activities to encourage students to engage with the material actively and work together to solve problems. L1 explained, "We incorporated collaborative learning activities to challenge students to think critically and leverage the diverse insights of their peers" (February 28, 2024, Gulu University). This approach facilitated a collaborative environment where students could develop their critical thinking skills through group interactions.

In summary, guided facilitation had a significant impact on critical thinking through structured discussions, reflective activities, and collaborative learning. Each concept contributed to the development of critical thinking skills in graduate students by providing opportunities for in-depth analysis, self-reflection, and teamwork. Insights from graduates, graduate students, and lecturers highlighted the effectiveness of these approaches in enhancing critical thinking and enriching the learning experience.

4.1.3.5 Critical Thinking in Graduate Students. Various participants, including graduates, graduate students, and lecturers, provided insights into how guided facilitation enhanced critical thinking skills in graduate students. Their insights were categorized into four key areas: application, analysis, evaluation, and synthesis. Each concept and its associated findings are detailed below:

4.1.3.5.1 Application. Application referred to the use of theoretical knowledge to address real-world problems and scenarios. In the context of guided facilitation, this involved encouraging students to apply what they had learned to practical situations, which reinforced

their understanding and promoted critical thinking. Graduate students highlighted that guided facilitation activities, such as case studies and practical simulations, were crucial for applying theoretical concepts to real-world problems. FGI noted, "Through guided facilitation, we were able to engage in case studies that required us to apply theoretical knowledge to practical scenarios, significantly enhancing our problem-solving skills" (February 5, 2024, Gulu University). Recent graduates G1, G4 and G10 G reflected on how guided facilitation helped them use their academic knowledge in practical settings. They appreciated assignments and projects that bridged theory with practice. For example, G4 stated, "The facilitation techniques used during my studies, such as problem-based learning, were key in helping me apply theoretical concepts to real-world issues, thus improving my critical thinking" (January 22, 2024, Gulu University).

Lecturer L1 observed that guided facilitation facilitated students' application of theoretical concepts through practical exercises. They integrated real-world problems into their teaching to help students apply what they had learned. L1 mentioned, "We used guided facilitation to design activities where students could apply theoretical concepts to real-world problems, which was crucial for developing their critical thinking skills" (February 28, 2024, Gulu University).

4.1.3.5.2 Analysis. Analysis involved breaking down complex information into its components to understand it better and identify patterns or relationships. Guided facilitation aided students in developing analytical skills by encouraging them to dissect problems and examine different aspects of the information. Graduate students valued the analytical exercises incorporated into guided facilitation. They reported that these exercises helped them develop a deeper understanding of complex topics by analyzing various components. FGI stated, "The analysis tasks during facilitated sessions allowed us to break down complex theories and

understand their components, which enhanced our analytical thinking" (February 5, 2024, Gulu University).

Recent graduates G2, G3 and G7 emphasized the importance of analytical skills developed through guided facilitation. They appreciated how facilitators used various strategies, such as detailed case analyses, to improve their ability to dissect and interpret information. G7 observed, "Facilitated sessions that involved analyzing case studies and data were crucial in developing my ability to critically evaluate information and understand complex issues" (January 25, 2024, Gulu University).

Lecturer L3 noted that guided facilitation was effective in promoting students' analytical skills. They designed activities that encouraged students to analyze data and arguments critically. L3 remarked, "Guided facilitation involved exercises where students had to analyze case studies and data sets, which significantly improved their analytical skills and critical thinking" (February 18, 2024, Gulu University).

4.1.3.5.3 Evaluation. Evaluation involved assessing the validity and relevance of information, arguments, or solutions. Guided facilitation supported this by encouraging students to critically assess and judge the merit of different viewpoints and evidence. Recent graduates G6, G8 and G9 found that guided facilitation significantly contributed to their ability to evaluate information critically. They recalled activities such as peer reviews and debates that sharpened their evaluative skills. G9 commented, "The evaluative components of facilitated sessions, such as peer assessments and debates, were instrumental in developing my ability to critically judge and analyze information" (January 20, 2024, Gulu University). Lecturer L2 highlighted the role of guided facilitation in teaching students to evaluate arguments and evidence effectively. They used techniques like Socratic questioning and critique exercises to enhance students' evaluative

skills. L2 stated, "We employed various strategies, such as Socratic questioning and critical reviews, during facilitated sessions to help students evaluate arguments and evidence more rigorously" (March 29, 2024, Gulu University).

4.1.3.5.4 Synthesis. Synthesis involved combining various pieces of information to form a coherent understanding or generate new ideas. Guided facilitation helped students integrate diverse viewpoints and knowledge to create new insights and solutions. Graduate L5 found that guided facilitation played a significant role in developing their ability to synthesize information. They appreciated assignments that required integrating diverse perspectives and data to solve complex problems. G5 observed, "Facilitated sessions that involved synthesizing information from different sources were key in helping me generate innovative solutions and understand complex issues better" (February 8, 2024, Gulu University).

In summary, the insights from graduates, graduate students, and lecturers demonstrated that guided facilitation significantly enhanced critical thinking in graduate students across several dimensions, including application, analysis, evaluation, and synthesis. Each participant group highlighted how different aspects of guided facilitation contributed to the development of these critical thinking skills.

4.2 Analysis of Findings

4.2.1 The Role of Case Scenarios in Nurturing Critical Thinking Skills among Graduate Students at Gulu University

4.2.1.1 Introduction. This section explores the pivotal role of case scenarios in enhancing critical thinking skills among graduate students at Gulu University. The exploration delves into the ways in which real-life and hypothetical case scenarios serve as effective educational tools, promoting students' analytical and problem-solving capabilities. By engaging

with these complex, context-rich scenarios, students are provided with opportunities to apply theoretical knowledge, critically evaluate diverse perspectives, and devise practical solutions. Analytical thinking, innovative solutions, practical application, and experiential learning are the sub-themes that guided the analysis in this objective.

4.2.1.2 Analytical Thinking. Analytical thinking is a fundamental aspect of critical thinking that involves breaking down complex issues into smaller, manageable components for thorough examination and understanding. At Gulu University, case scenarios significantly enhance analytical thinking among graduate students by encouraging them to dissect intricate problems, question underlying assumptions, and evaluate evidence meticulously. This process not only sharpens their ability to scrutinize data and form informed opinions but also prepares them to tackle real-world challenges with a structured, evidence-based approach. Through active engagement with case scenarios, students develop a robust framework for critical analysis, essential for their academic and professional success. The analysis of analytical thinking was guided by: analysing information, logical reasoning, systematic evaluation, creative problem-solving and synthesis, creative thinking, and integration of knowledge.

Analyzing information involves examining and interpreting data or content to gain insights, draw conclusions, and make informed decisions, participants collectively recognized the pivotal role of case scenarios in fostering critical thinking skills among graduate students at Gulu University. They highlighted that through analysing information, students were encouraged to thoroughly scrutinize data, question underlying assumptions, and ensure their decisions were evidence-based. This approach not only enhanced their ability to think critically but also ensured a rigorous evaluation of information. For instance, G6 mentioned, "Critical thinking involved a comprehensive analysis of information and challenging assumptions to base decisions on solid evidence" (January 2, 2024, Gulu University).

Logical reasoning to draw conclusions, and make decisions, this involves evaluating arguments, identifying relationships, and applying principles of logic to arrive at reasoned judgments or solutions. participants, noted that tcase scenarios required them to think analytically and draw logical conclusions. This structured approach to problem-solving was seen as essential in developing the ability to make well-informed decisions in complex situations. Participants highlighted the necessity of logical reasoning when working with case scenarios. For example, G8 explained, "Case scenarios challenged them to think analytically, draw logical conclusions from data, and make informed decisions to solve complex problems" (March 1, 2024, Gulu University).

Systematic evaluation is a structured approach to assessing and analyzing various elements of a project, process, or performance to make informed decisions and improvements, the importance of systematic evaluation was emphasized, with participants stressing the need to methodically assess information. Engaging with complex scenarios, such as those involving budgetary and staffing challenges, required students to critically prioritize, evaluate trade-offs, and justify their decisions with solid evidence. This methodical approach ensured that students developed a comprehensive understanding of the issues at hand, fostering critical thinking skills essential for their academic and professional success. Specifically, L1 pointed out, "Engaging with case scenarios involving budgetary and staffing challenges required graduate students to critically assess priorities, weigh trade-offs, and justify decisions based on evidence and educational principles" (February 28, 2024, Gulu University).

Creative problem-solving and synthesis involve using innovative thinking to tackle challenges and combining various elements to form new, cohesive solutions, creative problem-solving and synthesis are critical components of advanced critical thinking, requiring students to not only identify and analyse problems but also to integrate diverse pieces of information and

devise innovative solutions. At Gulu University, case scenarios play a vital role in nurturing these skills among graduate students. By presenting complex, multifaceted problems, case scenarios compel students to think creatively and holistically, synthesizing knowledge from various disciplines to develop practical, innovative solutions. For example, G9 noted, "This approach encourages students to move beyond conventional thinking, fostering a mindset that embraces creativity, adaptability, and interdisciplinary collaboration, essential attributes for addressing the intricate challenges they will face in their professional lives" (January 20, 2024, Gulu University).

Creative thinking is the ability to think in new and original ways to generate ideas, solve problems, and explore possibilities. It involves moving beyond conventional patterns of thought and employing imagination and innovation, this captures participants' emphasis on the role of creative thinking in solving complex problems presented in case scenarios10 stated, "Approaching case scenarios encourages creative thinking and synthesis of information to develop innovative solutions" (January 16, 2024, GU). Similarly, curriculum document emphasized, "The curriculum encourages students to approach problems creatively and synthesize diverse information to develop innovative solutions" (May 2, 2024, Head of Department Office).

Integration of knowledge refers to the process of combining information, insights, and expertise from various sources or domains to form a coherent and comprehensive understanding or to address complex problems, participants highlighted the importance of synthesizing information from various sources when engaging with case scenarios. FGI noted, "Engaging with case scenarios challenges assumptions, promotes consideration of multiple perspectives, and enhances problem-solving abilities" (February 5, 2024, Gulu University).

4.2.1.3 Practical Application. Practical application is a key aspect of learning that bridges the gap between theoretical knowledge and real-world practice, enabling students to apply what they have learned in meaningful and relevant contexts. At Gulu University, case scenarios are instrumental in facilitating this process for graduate students. By simulating real-life situations and challenges, case scenarios provide a platform for students to test and refine their theoretical understanding in practical settings. This hands-on approach not only enhances their problem-solving skills but also prepares them for the complexities of their future careers. Engaging with practical scenarios helps students gain confidence in their ability to navigate and address real-world issues, making their learning experience more dynamic and impactful. The analysis of practical application was guided by: applying theoretical knowledge and contextual learning.

Applying theoretical knowledge, involves using established theories, principles, and concepts to solve real-world problems, make decisions, and guide actions. participants emphasized how case scenarios enable students to apply theoretical knowledge to real-world situations, bridging the gap between theory and practice. G7 said, "Case scenarios help in understanding how theoretical knowledge applies to real-world problems, making the learning process more engaging" (May 3, 2024, Gulu University). Additionally, reports on teaching and learning noted, "Case scenarios act as catalysts for critical thinking by presenting complex problems or dilemmas that require analysis, synthesis, and decision-making" (January 25, 2024, Gulu University).

Ccontextual learning this focuses on how case scenarios provide context for learning, making theoretical concepts more relatable and easier to understand, it further links the content being taught to real world situation and experiences. L2 observed, "Case scenarios provide

practical applications of theoretical knowledge, giving context to learning and promoting critical thinking" (March 29, 2024, Gulu University).

4.2.1.4 Experiential Learning. Experiential learning is a dynamic and interactive educational approach that emphasizes learning through direct experience and reflection. This method engages learners actively in a process where they gain knowledge and skills from real-world experiences. By participating in hands-on activities, simulations, internships, and other practical applications, learners can connect theoretical concepts to practical contexts, enhancing their understanding and retention. This learner-cantered approach fosters critical thinking and problem-solving skills. The analysis of experiential learning was guided by: hands-on learning, real-world challenges, active learning, interactive learning, and collaborative learning.

Hands-on learning is an educational approach that emphasizes learning through direct, practical experience and active engagement with material, rather than passive receipt of information, participants discussed how case scenarios offer hands-on learning opportunities that enhance analytical skills and problem-solving abilities. G5 explained, "Working with case scenarios allows for experimenting and testing understanding in a practical setting, aiding in grasping concepts more firmly" (January 8, 2024, Gulu University). FG1 added, "Case scenarios as practical applications of theoretical knowledge provide context for learning and promote critical thinking" (February 5, 2024, Gulu University).

Real-world challenges are complex problems or issues that individuals, organizations, or societies face in everyday life. this highlights the role of case scenarios in simulating real-world challenges, preparing students for future professional scenarios. G4 stated, "Highlighted examples of innovative case scenarios, such as hypothetical business cases for strategic decision-making and design challenges in engineering programs" (January 22, 2024, Gulu University).

Aactive learning is an educational approach that emphasizes student engagement and participation in the learning process, fostering deeper understanding and retention of knowledge. At Gulu University, the use of case scenarios is a key strategy in promoting active learning among graduate students. These scenarios require students to actively engage with the material, collaborate with peers, and apply their knowledge to solve complex problems. By moving beyond passive listening to involve discussion, analysis, and hands-on activities, case scenarios create an interactive learning environment that enhances critical thinking and decision-making skills. This active involvement not only makes learning more enjoyable but also helps students develop practical skills and confidence in applying their knowledge in real-world contexts. L3 indicated, "Case scenarios encouraged active engagement and collaborative learning, facilitating the development of analytical and decision-making skills" (February 18, 2024, Gulu University).

Interactive learning is an educational approach that emphasizes active engagement and participation in the learning process, participants emphasized the use of case scenarios to foster interactive and collaborative learning environments. G3 mentioned, "Working on case scenarios makes understanding the material easier due to active engagement, making the learning process more dynamic and enjoyable" (February 20, 2024, Gulu University). Curriculum document showed, "Case scenarios are interactive learning tools that encourage active engagement and collaborative learning, facilitating the development of analytical and decision-making skills."

Collaborative learning is an educational approach where learners work together in groups to achieve common goals, solve problems, or complete tasks, this captures how case scenarios promote teamwork and collaborative problem-*solving* among students. G2 discussed the role of case scenarios in managing cultural diversity and community engagement strategies (March 30, 2024, Gulu University).

4.2.1.5 Innovative Solutions. Innovation refers to the process of creating new ideas, products, or methods that provide novel solutions to problems or improve upon existing solutions. This explores how case scenarios prompt students to devise innovative solutions to complex problems. G1 mentioned, "Analysing complex scenarios taught us to consider different angles and develop creative solutions" (February 20, 2024, Gulu University). However, graduate students' assessments and evaluation reports further provided examples of complex case scenarios requiring creative problem-solving, such as hypothetical business cases and engineering design challenges (May 4, 2024, Gulu University).

The findings highlight the critical role of case scenarios in fostering various dimensions of critical thinking skills among graduate students at Gulu University. By engaging with analytical thinking, practical application, experiential learning, and innovative solutions, students develop robust problem-solving.

4.2.2 The Role of Academic Collaborations in Nurturing Critical Thinking Skills among Graduate Students at Gulu University

4.2.2.1 Introduction. The analysis of data on academic collaborations at Gulu University revealed several insights that illustrate distinct aspects of how collaborative academic efforts contribute to the development of critical thinking skills. This analysis was guided by the subthemes: shared resources, expertise exchanges, and scholarly advancement.

4.2.2.2 Shared Resources. Academic collaborations often involve the pooling of resources, which significantly enhances the research capabilities of graduate students. By sharing resources, such as access to specialized equipment, libraries, databases, and funding, students can engage in more comprehensive and in-depth research. This shared access not only broadens their investigative scope but also fosters critical thinking by exposing students to a variety of

tools and methodologies they might not have encountered otherwise. For instance, participant G1 described these partnerships as "designed to advance knowledge through shared expertise" (February 28, 2024, Gulu University). This resource-sharing encourages efficiency and innovation, as noted by FGI participants, who emphasized that, "pooling resources allows for more ambitious and interdisciplinary research projects" (February 5, 2024, Gulu University). The collaborative nature of these endeavors ensures that students learn to optimize and utilize diverse resources effectively, enhancing their problem-solving skills and ability to think critically about resource management and application.

4.2.2.3 Expertise Exchanges. Exchanging expertise is a core element of academic collaborations, where graduate students benefit immensely from the knowledge and skills of their peers, mentors, and external experts. These interactions expose students to a breadth of perspectives and advanced techniques that enrich their educational experience and cultivate critical thinking. Participant L2 emphasized that, "academic collaborations develop critical thinking by encouraging students to tackle problems from various perspectives" (February 28, 2024, Gulu University). This exposure to different analytical frameworks and problem-solving approaches helps students break down complex issues and understand cause-and-effect relationships more profoundly. Additionally, highlighted that, "successful collaborations often stem from clear communication and the ability to respect and integrate diverse viewpoints" (March 30, 2024, Gulu University). By working closely with others who bring unique expertise, students learn to question assumptions, synthesize diverse information, and develop innovative solutions, all of which are hallmarks of critical thinking.

4.2.2.4 Scholarly Advancement. Collaborative academic efforts lead to significant scholarly advancement by fostering an environment where joint research projects and interdisciplinary studies can thrive. These collaborations contribute to the production of high-

quality scholarly work and the advancement of knowledge, which in turn nurtures critical thinking among graduate students. Participant G4 explained that, "academic collaborations involve researchers or institutions working together to achieve common research goals, resulting in innovative insights and academic progress" (January 22, 2024, Gulu University). The interdisciplinary nature of many collaborations encourages intellectual exchange and the integration of diverse perspectives, as noted by participant L1, stated, "such teamwork leads to a more comprehensive understanding of research topics" (February 28, 2024, Gulu University). This collaborative approach to scholarship not only pushes the boundaries of current knowledge but also teaches students to critically evaluate and synthesize information from multiple disciplines. Moreover, institutional report on faculty development, showed joint research projects across disciplines often result in innovative insights and academic progress, highlighting the role of interdisciplinary teamwork in fostering intellectual exchange and innovation (January 20, 2024, Gulu University). By participating in these collaborative efforts, graduate students at Gulu University develop critical thinking skills that are essential for addressing complex research questions and contributing to scholarly discourse.

In conclusion, academic collaborations play a crucial role in fostering critical thinking skills among graduate students at Gulu University. Through the shared use of resources, exchanges of expertise, and contributions to scholarly advancement, these collaborations enhance problem-solving and analytical reasoning, promote effective communication and teamwork, and require adaptability and flexibility. The multifaceted nature of these collaborations drives innovation, problem-solving, and the advancement of knowledge, ultimately contributing to the development of critical thinking skills essential for academic and professional success.

4.2.3 The Role of Guided Facilitations in Promoting Critical Thinking Skills among Graduate Students at Gulu University

4.2.3.1 Introduction. This section canters on how guided facilitations promote critical thinking skills among graduate students at Gulu University, focusing on the subthemes: peer review support, facilitator support, and facilitation framework.

4.2.3.2 Peer Review Support. Peer review support plays a critical role in fostering critical thinking among students by providing a structured environment for the evaluation of each other's work. This process involves students engaging in constructive critique and analysis, which enhances their understanding and analytical skills. For example, G5 mentioned that "structured peer review sessions help students systematically develop their analytical skills." (February 8,2024, Gulu University). However, check of teaching and learning policies revealed that facilitators create a reliable environment where students can engage in peer reviews, ensuring they receive consistent guidance that promotes cognitive growth and academic success. The primary purpose of peer review support is to deepen students' analytical skills and understanding of the subject matter. By evaluating their peers' work, students learn to critique constructively and engage critically with the content. (March 11 Academic Registrar Office).

Similarly, G10 emphasized that "peer reviews allow students to deconstruct complex information, fostering critical analysis and improved understanding." (January 16, 2024). Students assessments and evaluations reports and faculty development materials also indicated that peer reviews involve probing questions that encourage students to delve deeper into the material, promoting critical engagement. (March 12, 2024, Gulu University).

4.2.3.3 Facilitators Support. Facilitator support is crucial in guiding students through their critical thinking journey. Facilitators provide a structured approach that offers clarity and

consistency, essential for nurturing critical thinking skills. L1 noted, "Guided facilitation at Gulu University is intentionally designed to support critical thinking by providing a structured framework for facilitators." (February 28, Gulu University). The primary purpose of facilitator support is to enhance students' engagement and comprehension of the material. Facilitators use strategies such as scaffolding to break down complex information into manageable components, fostering better understanding and critical analysis. G9 emphasized, "Scaffolding helps deconstruct complex information, thereby fostering improved understanding and critical analysis." (January 20, 2024, Gulu University). Teaching and learning reports also indicated that facilitators use probing questions to encourage deeper engagement with the content. (February 2, 2024, Gulu University).

4.2.3.4 Facilitation Framework. The facilitation framework provides a systematic approach for guided facilitation, ensuring consistency and clarity. This framework is crucial for nurturing critical thinking skills. L3 mentioned, “guided facilitation at Gulu University is designed to support critical thinking by providing a structured framework for facilitators." (February 18, 2024, Gulu University). Further, teaching and learning reports revealed that this structured approach ensures that students receive consistent guidance, promoting cognitive growth and academic success. The facilitation framework aims to enhance students' engagement and comprehension of the material. Strategies such as scaffolding are employed to break down complex information into manageable components, fostering improved understanding and critical analysis. (March 12, 2024, Deans Office). G8 emphasized that "scaffolding helps deconstruct complex information, thereby fostering improved understanding and critical analysis." (March 1, 2024, Gulu University).

The analysis reveals that guided facilitations play a significant role in promoting critical thinking skills among graduate students at Gulu University. Peer review support, facilitator

support, and a structured facilitation framework all contribute to creating an environment that fosters critical engagement, analytical thinking, and academic success. By employing various techniques and strategies, facilitators and peer reviews provide the necessary support and structure for students to develop and enhance their critical thinking abilities.

4.3 Interpretation of Findings

4.3.1 The Role of Case Scenarios in Nurturing Critical Thinking Skills among Graduate Students at Gulu University

The utilization of case scenarios has proven to be a powerful tool in enhancing critical thinking skills among graduate students at Gulu University. By presenting practical, real-world contexts, case scenarios require students to employ analytical and reflective problem-solving approaches, thereby deepening their ability to apply theoretical knowledge in meaningful ways. This cognitive engagement emerges from several interrelated sub-themes: analytical thinking, innovative solutions, practical application, and experiential learning. These factors collectively contribute to the development of critical thinking skills among graduate students.

4.3.1.1 Cognitive Engagement. At Gulu University, cognitive engagement stands as a cornerstone of the educational framework, characterized by the active and sustained mental effort that graduate students invest in their academic pursuits. This engagement involves focused attention on dissecting complex problems, critically analysing information, and integrating new knowledge with existing understanding. Motivated intrinsically by their genuine interest in the practical implications of the scenarios presented, students cultivate not only critical thinking and creative problem-solving skills but also resilience and persistence in overcoming academic challenges. As highlighted by FGI on February 5 2024 at Gulu University, "active engagement turns theoretical knowledge into practical wisdom," underscoring how immersive learning experiences foster comprehensive understanding and effective application of knowledge.

Within this framework, FGI participants, a diverse group of graduate students, brought varied perspectives shaped by their unique circumstances. Many faced challenges such as surpassing cohort timelines while completing dissertations, demonstrating perseverance and determination in their academic pursuits. The group comprised individuals from different sectors and roles, predominantly older professionals seeking career advancement through further education. Their personal backgrounds, often balancing familial responsibilities as married individuals with children, underscored their motivations for academic achievement. These factors collectively influenced their belief in the transformative power of active engagement, emphasizing its role in bridging theoretical learning with practical application in both academic and professional settings.

Moreover, the statements of FGI participants on active engagement were likely influenced by macroeconomic factors such as global shifts towards knowledge-based economies. These shifts emphasize the practical application of skills and knowledge, driving a demand for individuals capable of translating theoretical learning into tangible outcomes. Educational reforms promoting human capital development and innovation also shaped their perspectives, aligning with policies aimed at fostering a skilled workforce through practical education initiatives. In a university setting like Gulu, where educational advancements are pivotal to broader socio-economic goals, political support for active learning practices further reinforced their advocacy for integrating academic theory with real-world application. These macroeconomic and political dynamics collectively underscored the importance of active engagement in preparing individuals to meet contemporary economic and societal challenges effectively.

Aligned with Vygotsky's collaborative learning theory, FGI participants valued social interaction and active engagement as integral to their educational experiences. Vygotsky posited

that learning is enhanced through interactions with peers and mentors who scaffold knowledge acquisition and cognitive development. In collaborative learning environments, FGI participants engaged in dialogue, shared problem-solving, and cooperative activities that deepened their understanding and application of theoretical concepts. By actively participating in these interactions, they leveraged collective knowledge and diverse perspectives to foster critical thinking, communication skills, and practical wisdom. Their adherence to collaborative learning principles not only supported Vygotsky's theory of cognitive growth through social interactions but also enriched their ability to think analytically and make informed decisions in academic and professional contexts.

In conclusion, FGI participants at Gulu University demonstrated how adherence to Vygotsky's collaborative learning theory, coupled with active engagement in case scenarios, enhanced critical thinking skills among graduate students. Through interactive discussions and collaborative problem-solving tasks, they honed their ability to evaluate information critically, analyze complex issues, and propose innovative solutions. This holistic approach to learning not only aligned with educational frameworks at Gulu University but also prepared students to navigate challenges in their academic journeys and professional careers effectively. Ultimately, the integration of case scenarios in educational practices emerges as a transformative strategy for nurturing comprehensive critical thinking skills essential for success in today's dynamic world.

4.3.2 The Role of Academic Collaborations in Fostering Critical Thinking Skills among Graduate Students at Gulu University

Academic collaborations play a crucial role in fostering critical thinking skills among graduate students at Gulu University. By engaging in interdisciplinary projects, research partnerships, peer learning groups, and mentorship programs, students gain access to diverse perspectives and expertise. Workshops, seminars, collaborative learning platforms, community

engagement, international exchanges, joint publications, and networking opportunities further enhance their learning experience. This synergy emerges from interrelated factors: shared resources, expertise exchange, and scholarly collaboration. These efforts collectively contribute to the development of critical thinking skills, preparing students to tackle complex academic and professional challenges effectively

4.3.2.1 Synergy in Academic Collaborations. At Gulu University, synergy embodies the collective strength derived from integrating diverse perspectives, skills, and expertise to achieve outcomes greater than individual efforts alone. This collaborative ethos pervades the university's academic landscape, fostering partnerships among students, faculty, and external experts across disciplines to address complex challenges and advance knowledge. As highlighted by FGI, "Interdisciplinary teamwork and intellectual exchange foster intellectual exchange and innovation by pooling diverse expertise and resources" (February 5, 2024, Gulu University). This citation underscores how synergy enables the synthesis of various viewpoints, encouraging innovative problem-solving approaches through creative dialogue and collaborative efforts. Furthermore, synergy nurtures a culture of continuous learning and mutual growth, enhancing critical thinking, teamwork, and communication skills essential for navigating real-world challenges effectively. Thus, synergy not only enhances academic excellence through interdisciplinary collaboration but also prepares students comprehensively for professional and societal roles.

The FGI participants' voices in personal context reflected how their personal backgrounds and experiences at Gulu University influenced their perspectives on synergy in academic collaborations. Graduate students from diverse academic disciplines and varying levels of experience appreciated how this diversity enriched collaborative efforts. Their recognition of synergy's benefits in interdisciplinary interactions for problem-solving and knowledge

integration was shaped by firsthand experiences within the university's academic environment. Faculty members, who provided academic guidance and mentorship, played a pivotal role in instilling values such as mutual respect, clear communication, and adaptability in collaborative settings. These values, influenced by their personal teaching philosophies and experiences, guided participants' perceptions of what constituted successful collaborations.

Moreover, external experts, drawing from their professional backgrounds, contributed practical insights that bridged theoretical concepts with real-world applications. This exposure to external expertise likely broadened participants' perspectives on the relevance and impact of their academic endeavors, reinforcing the value of collaborative efforts across disciplines. Together, these personal contexts created a dynamic and inclusive environment where participants recognized and appreciated the collective achievements facilitated by synergy in academic collaborations at Gulu University. Thus, the FGI voices in the personal context illustrated how participants' personal backgrounds and roles within the university community shaped their understanding and articulation of the significance of synergy in collaborative academic settings.

FGI participants at Gulu University were likely influenced by macro factors, such as global educational trends and imperatives, in their discussions on synergy in academic collaborations. Academically, the alignment of interdisciplinary approaches and collaborative learning with institutional goals and global standards likely shaped participants' views on the importance of diverse perspectives and collaborative efforts for achieving academic excellence. Economically, the recognition of synergy as a driver of innovation and essential for addressing societal challenges would have resonated with participants, emphasizing the practical relevance of their academic endeavors in fostering economic growth and competitiveness. Politically, the endorsement of policies promoting educational excellence and human capital development would have underscored the societal contributions of collaborative research and interdisciplinary

teamwork, influencing how participants perceived their roles in national development agendas. Therefore, considering these macro influences, it is highly probable that FGI participants' perspectives on synergy were significantly informed and guided by these broader educational, economic, and political contexts.

In the context of Vygotsky's theory of collaborative learning, synergy in academic collaborations at Gulu University closely aligns with fostering critical thinking skills among graduate students. Vygotsky posited that learning occurs through social interaction and collaboration, where peers and mentors scaffold knowledge acquisition and cognitive development. At Gulu University, academic collaborations embody these principles by facilitating interactions among diverse participants students, faculty, and external experts who bring varied perspectives and skills to the table. Through collaborative endeavors, students engage in dialogue, share ideas, and collectively tackle complex problems, thereby enhancing their critical thinking abilities. This collaborative process enables students to critically evaluate different viewpoints, analyze information, and synthesize new insights, which are fundamental components of robust critical thinking skills. Moreover, collaborative work allows students to navigate interdisciplinary challenges, adapt their approaches, and integrate diverse knowledge domains, reflecting Vygotsky's notion that cognitive growth is propelled through social interactions and collaborative efforts.

In conclusion, synergy in academic collaborations at Gulu University represents a cohesive approach to integrating diverse perspectives and skills for achieving academic excellence and preparing students for professional roles. This collaborative spirit not only enhances problem-solving capabilities but also fosters critical thinking, teamwork, and communication skills essential for navigating complex challenges in the real world. By embracing Vygotsky's collaborative learning theory and aligning with global educational trends

and imperatives, Gulu University continues to cultivate an environment where interdisciplinary synergy not only enhances academic outcomes but also prepares graduates to contribute meaningfully to societal advancements. The synergy-driven approach underscores the university's commitment to nurturing well-rounded professionals capable of addressing contemporary global challenges through innovative and collaborative practices.

4.3.3 The Role of Guided Facilitations in Promoting Critical Thinking Skills among Graduate Students at Gulu University

In the academic sphere of Gulu University, guided facilitation stands as a cornerstone of academic excellence, nurturing critical thinking skills among graduate students. Effective facilitation empowers students to navigate the complexities of their studies, fostering robust problem-solving abilities and preparing them comprehensively for challenges beyond academia. This scaffolding emerges from several interrelated sub-themes: peer review support, facilitator guidance, and structured facilitation frameworks. These factors collectively contribute to the development of critical thinking skills, enabling students to tackle complex academic and professional challenges effectively.

4.3.3.1 Scaffolding in Education. Scaffolding in education involves systematic support and guidance from educators to help students acquire new knowledge and skills. This pedagogical approach includes breaking down complex tasks into manageable steps, providing prompts or cues to enhance understanding, and offering constructive feedback to improve learning outcomes. Participant L2 highlighted, “the facilitators play active role in structuring learning experiences, providing direction, and cultivating an environment conducive to independent thinking” (March 29, 2024, Gulu Uuniversity). Effective scaffolding not only promotes academic growth but also nurtures critical thinking and problem-solving abilities essential for lifelong learning and success.

Additionally, L2's personal context a male aged 58, formerly a head of department, and married likely, greatly influenced his perspective on scaffolding in education. His leadership experience in educational settings, overseeing curriculum development and implementing strategies to enhance student outcomes, shaped his belief in structured learning experiences. L2 emphasized the facilitator's role in fostering independent thinking, drawing from his practical experiences, leadership insights, and personal values. Similarly, his maturity and family role likely influenced his approach, emphasizing nurturing and supportive aspects crucial for guiding students toward academic success.

Further, L2's perspectives were likely shaped by macro-level influences encompassing global educational trends and imperatives during his tenure as Head of Department. He was deeply attuned to institutional goals and educational policies, both within Gulu University and in the broader educational landscape. L2 advocated for aligning educational strategies with global standards and local reforms aimed at enhancing learning outcomes and cultivating critical thinking skills among students. His insights into educational evolution in response to economic pressures and national development agendas underscored the broader societal impacts of scaffolding and instructional practices. This nuanced understanding ensured relevance and effectiveness in preparing students for future challenges and opportunities.

Similarly, L2's perspective, rooted in Vygotsky's theory of collaborative learning, highlights the facilitator's pivotal role in fostering critical thinking skills among graduate students at Gulu University. Vygotsky posited that learning occurs socially through interactions with knowledgeable others who provide scaffolding support and guidance to facilitate cognitive development. L2 emphasized the facilitator's role in structuring learning experiences, promoting independent thinking, and facilitating collaborative problem-solving. Through interdisciplinary dialogue and idea exchange facilitated by L2 and colleagues, students are encouraged to

critically evaluate perspectives, analyze information, and synthesize insights. These activities not only deepen academic understanding but also cultivate essential skills for professional and personal growth, aligning with Vygotsky's theory of collaborative learning.

In conclusion, the multifaceted role of guided facilitation in promoting critical thinking skills among graduate students at Gulu University emerges as pivotal for academic excellence and beyond. Through effective scaffolding, educators like L2 not only support students in mastering complex concepts but also empower them to think independently and critically. L2's personal and professional experiences underscore how leadership, practical insights, and theoretical frameworks such as Vygotsky's collaborative learning theory converge to shape a pedagogical approach that prepares students to navigate diverse challenges in their academic and professional journeys. By fostering an environment where independent thinking thrives and interdisciplinary collaboration flourishes, educators at Gulu University continue to nurture a generation of thoughtful, adaptable, and capable professionals equipped to contribute meaningfully to society.

Chapter Five

Discussion, Conclusion and Recommendation

5.0 Introduction

In this section I discuss findings in relation to the current literature, focusing on the role of case scenarios, academic collaborations, and guided facilitations in nurturing critical thinking among graduate students at Gulu University.

5.1 Discussion of Findings

5.1.1 The Role of Case Scenarios in Nurturing Critical Thinking Skills among Graduate Students at Gulu University

In this section I discuss how case scenarios at Gulu University enhance critical thinking skills among graduate students. By presenting real-world challenges and encouraging the practical application of theoretical knowledge, case scenarios foster analytical and innovative problem-solving abilities. The discussion emphasizes their role in enhancing analytical thinking, practical application, experiential learning, and the development of innovative solutions, drawing on findings from Gulu University and existing literature, and theories.

The current study provided a comprehensive analysis of how case scenarios could enhance critical thinking skills among graduate students. The research revealed that case scenarios played a crucial role in bridging the gap between theoretical knowledge and practical application. By engaging with complex problems, students applied theoretical concepts while developing their analytical and innovative problem-solving abilities. These findings aligned with Ahern et al. (2019) who demonstrated that structured case studies improved logical reasoning and systematic evaluation. The current study reinforced this, showing that students engaged deeply with problems, challenged assumptions, and critically assessed evidence. However, Brady et al. (2023) had noted a limitation regarding the cultural diversity of clinical scenarios, which

affected students' preparedness for global health challenges. The current study echoed this concern, finding that while case scenarios improved analytical thinking, a lack of cultural diversity in some scenarios could limit students' effectiveness in diverse socio-economic contexts.

In the field of legal education, the current study's findings were consistent with those of Johnson and Shen (2020) who utilized moot court exercises to enhance students' analytical and argumentative skills. The study observed similar improvements in legal reasoning abilities. Nevertheless, Roser-Jones (2024) had reported that outdated legal precedents and the absence of contemporary issues, such as data privacy, constrained the effectiveness of legal case scenarios. The current study also identified that some legal scenarios were outdated, suggesting a need for more current and relevant case studies to address modern legal challenges. Similarly, in business education, Kopnina et al. (2024) had demonstrated that case studies involving market entry strategies and competitive dynamics improved decision-making and strategic thinking. The current study confirmed these benefits, noting significant enhancements in students' strategic problem-solving skills. However, Chen and Wong (2023) had observed that some business case scenarios lacked contextual relevance, failing to reflect regional economic conditions and industry-specific challenges. The current study corroborated this finding, indicating that business case scenarios needed to be more tailored to regional and industry-specific contexts to enhance their educational value.

In engineering education, Werth and Williams (2021) had found that project-based scenarios for designing sustainable energy systems fostered problem-solving skills and creativity. The current study reported similar benefits, noting that project-based case scenarios promoted critical thinking by integrating technical knowledge with practical constraints. However, Green et al. (2024) had criticized overly simplified engineering scenarios for omitting

real-world constraints. The current study similarly found that some engineering scenarios were too simplified, which limited their effectiveness in preparing students for real-world engineering challenges. This suggested a need for more complex scenarios that better represented the multifaceted nature of professional engineering practice.

In public health education, Kim et al. (2022) had shown that scenarios involving public health emergencies significantly improved students' abilities to manage health crises and formulate policies. The current study found that case scenarios enhanced students' capacity to address public health challenges. However, Watts et al. (2015) had noted inadequacies in some public health scenarios, particularly in addressing social determinants of health. The current study similarly identified that some scenarios did not fully account for socio-economic factors, suggesting that incorporating a broader range of determinants could provide a more comprehensive understanding of public health issues.

In education and pedagogy programs, Roberts (2023) had explored scenarios for managing classroom dynamics and designing instructional plans, reporting improvements in teaching skills and problem-solving abilities. The current study supported these findings, indicating that case scenarios helped students develop effective teaching strategies. Nonetheless, Abratenko et al. (2024) had highlighted challenges in creating scenarios that accurately reflected diverse classroom settings. The current study also found that some scenarios did not fully capture the complexities of diverse learning environments, pointing to a need for more representative scenarios in education and pedagogy programs.

The current study’s emphasis on both analytical thinking and creative problem-solving marked a departure from the findings of (Veríssimo et al., 2024) who primarily focused on logical reasoning and systematic evaluation. The current study expanded this perspective by

demonstrating that case scenarios not only enhanced analytical skills but also fostered creative synthesis and innovative solutions. This broader application of critical thinking aligned with (Larsson, 2017), who had observed similar benefits in Sub-Saharan Africa, though these studies did not emphasize creativity as much as the current study. This suggested that integrating creative problem-solving into case-based learning offered a more holistic approach.

The current study also supported Kolb's (1984) experiential learning theory, which advocated for the integration of theory and practice. While Kolb's framework supported this integration, the current study extended it by emphasizing the importance of culturally relevant scenarios. Cooke et al. (2021) had also supported theory-practice integration but did not address the cultural and contextual adaptations noted in this study. This focus on cultural relevance underscored the need for case scenarios that reflected specific cultural and regional contexts to enhance their educational impact.

A notable difference in the current study was its emphasis on cultural diversity in case scenarios. Banks (2015) had highlighted that the lack of cultural diversity in clinical scenarios limited students' preparedness for global health challenges. The current study found that incorporating cultural diversity into case scenarios significantly improved students' understanding of diverse socio-economic and cultural contexts. This extended Nguyen et al.'s work by demonstrating that culturally diverse scenarios enhanced students' abilities to address both global and local issues, contrasting with Wang et al. (2023), who had not specifically addressed cultural diversity. This divergence highlighted the importance of integrating cultural and regional differences into case scenarios to better prepare students for diverse professional environments.

Additionally, the current study highlighted the role of case scenarios in fostering innovative problem-solving and interdisciplinary collaboration, aligning with Brown et al. (2014), who emphasized the need for innovative thinking to tackle contemporary challenges. The detailed examples provided in the current study, such as hypothetical business cases and engineering design challenges, offered practical frameworks for fostering creativity. This specificity added detail not present in Brown et al.'s broader discussion. Saposnik et al. (2016) had also supported the role of case scenarios in promoting innovative thinking but did not provide the same level of practical detail. This difference suggested that specific types of case scenarios could vary in their effectiveness in fostering creativity, highlighting the need for further research into optimizing scenario design to maximize its impact on problem-solving.

The current study also called for longitudinal research to assess the long-term impact of case scenarios on students' career trajectories and professional competencies, echoing (Taylor, 2020). They had emphasized the importance of robust assessment methods to measure the enduring benefits of experiential learning. The current study revealed a gap in understanding the long-term impact and scalability of case scenarios, suggesting that while immediate benefits were evident, further research was needed to evaluate how these benefits translated into long-term professional development. This focus on longitudinal assessments provided a valuable direction for future research, highlighting the need for studies that examined the lasting impact and scalability of case-based learning across diverse educational contexts.

The current study provides a comprehensive analysis of how case scenarios enhance critical thinking skills among graduate students. The research reveals that case scenarios are instrumental in bridging the gap between theoretical knowledge and practical application, allowing students to apply theoretical concepts while developing their analytical and innovative

problem-solving abilities. This finding is consistent with and extends the insights provided by a range of recent scholars.

The study's finding that case scenarios bridge the gap between theory and practice is well-supported by recent research. For instance, Poremski et al. (2023)highlights the significance of case-based learning in STEM fields, showing that case scenarios help students translate theoretical concepts into practical solutions. Similarly, Martin et al. (2021) demonstrates that case scenarios in environmental engineering education enable students to address real-world challenges, aligning with the current study’s assertion that practical engagement enhances critical thinking. These findings are complemented by Edwards et al. (2021)who discusses how project-based case scenarios in engineering education foster creativity and critical analysis, further reinforcing the idea that case scenarios effectively bridge theoretical knowledge and practical application.

In summary, the current study reaffirmed the effectiveness of case scenarios in enhancing both critical and creative thinking among graduate students. While it aligned with existing literature on the benefits of case scenarios in fostering analytical thinking and practical application, it also identified specific limitations such as cultural diversity, contextual relevance, and real-world complexity. Addressing these gaps through more inclusive, relevant, and realistic scenarios would enhance their educational impact and better prepare graduate students for the complexities of their professional fields. Future research should focus on broader interdisciplinary applications, comparative studies across different educational contexts, and longitudinal assessments to further advance the impact of case scenarios on critical thinking globally.

5.1.2 The Role of Academic Collaborations in Fostering Critical Thinking Skills among Graduate Students at Gulu University

Academic collaborations significantly nurture critical thinking skills by offering students opportunities to engage with diverse perspectives, methodologies, and resources. This section discusses the impact of shared resources, expertise exchanges, and scholarly advancement on critical thinking development at Gulu University. The findings illustrate how these collaborative efforts boost research capabilities, facilitate knowledge exchange, and promote interdisciplinary teamwork, ultimately enhancing students' intellectual growth and analytical abilities. Each aspect underscores the transformative effects of academic collaborations in fostering a deeper understanding and application of critical thinking skills within graduate education.

The study conducted at Gulu University underscores that pooling resources through academic collaborations significantly enhances graduate students' research capabilities and critical thinking skills. The research revealed that access to advanced tools and methodologies, such as specialized research databases and sophisticated laboratory equipment, broadened students' investigative scope and deepened their analytical abilities. For instance, the introduction of high-resolution imaging tools in a collaborative biomedical research project allowed students to explore complex biological phenomena with greater precision. This technological advancement led to more robust and insightful research outcomes, highlighting the transformative impact of resource sharing in academic settings (Gulu University Study, 2024). The Gulu study’s findings are consistent with Kuh et al. (2015) who posited that access to diverse resources is crucial for expanding students' investigative capabilities. Kuh et al. (2015) emphasized that resource sharing enriches students' learning experiences by offering a broader array of tools and perspectives. The alignment between the Gulu study and lies in their shared emphasis on how diverse resources contribute to enhanced critical thinking. Both studies

highlight that exposure to various tools enables students to engage in more comprehensive analyses and develop a deeper understanding of their research topics.

Furthermore, the study aligns with Loes and Pascarella (2017) and Taylor et al. (2020), who also support the role of academic collaborations in enhancing critical thinking skills. Johnson and Smith (2017) discussed the role of resource sharing in educational psychology, emphasizing how collaborative environments foster critical thinking by facilitating knowledge exchange. Taylor et al. (2020) extended this understanding by focusing on interdisciplinary resource sharing, demonstrating how exposure to diverse methodologies enhances analytical skills. The Gulu study builds on these findings by demonstrating that the impact of specialized and contextually relevant resources is particularly significant at the graduate level. This specificity adds depth to the broader insights provided by Loes and Pascarella (2017) and Taylor et al. (2020). While Kuh et al. (2015) offered a broad overview of resource-sharing benefits, their study did not specifically address the graduate education context. The Gulu study addresses this gap by providing targeted insights into how shared resources in academic collaborations contribute to critical thinking among graduate students. This distinction is crucial for understanding the nuanced benefits of resource sharing in postgraduate education, thereby enriching the literature on this topic.

The Gulu University study also found that expertise exchanges among students, faculty, and external experts are vital for developing critical thinking skills. The study reported that interactions with mentors and specialists provided students with access to advanced techniques and diverse perspectives, significantly enhancing their analytical capabilities. For instance, a collaborative project with data science experts enabled students to acquire new analytical techniques and problem-solving strategies, which enriched their research and improved their critical thinking (Gulu University Study, 2024). These findings resonate with Vygotsky (1978)

social development theory, which posits that cognitive development is enhanced through social interactions and expert guidance. Vygotsky (1978) argued that interactions with more knowledgeable individuals facilitate deeper understanding and skill acquisition. The Gulu study extends Vygotsky's theory by demonstrating how targeted expertise exchanges, such as workshops with data science experts, directly contribute to improve critical thinking among graduate students. This practical application of Vygotsky's theory provides concrete examples of how social interactions and expert guidance influence cognitive development in educational contexts.

Additionally, Brown and Wilson (2018) and Patel (2021) support the role of expertise exchanges in fostering critical thinking. Brown and Wilson (2018) highlighted that interactions with mentors enhance problem-solving abilities, while Patel (2021) emphasized the benefits of practical insights from industry experts. The Gulu study concurs with these findings but introduces a nuanced perspective by emphasizing the alignment between mentor expertise and students' research needs. This focus on relevance and specificity in expertise exchanges provides a more detailed understanding of how these interactions can be optimized, which was not extensively covered in previous studies. The Gulu study's emphasis on the alignment of expertise with research needs offers a refined view compared to the broader discussions of Brown and Wilson (2018) and Patel (2021). This specific focus on practical relevance and its impact on critical thinking highlights the importance of tailoring mentorship and expertise exchanges to students' research objectives, thereby contributing valuable insights to the existing literature.

The research at Gulu University revealed that scholarly advancement through interdisciplinary and collaborative projects significantly enhances critical thinking skills among graduate students. The study found that participation in interdisciplinary research teams led to the development of more robust analytical skills and a deeper understanding of complex issues.

For example, a project integrating environmental science and urban planning resulted in innovative solutions for sustainable development, demonstrating the benefits of combining expertise from multiple disciplines (Gulu University Study, 2024). This observation aligns with Terenzini et al. (2001) who argued that interdisciplinary teamwork enhances critical thinking by integrating diverse perspectives. Terenzini et al. (2001) highlighted the value of collaborative research in promoting analytical skills, a view that is reflected in the Gulu study's findings. Both studies demonstrate that interdisciplinary collaborations enable students to approach problems from multiple angles, thereby improving their problem-solving capabilities.

However, the Gulu study identified specific challenges related to institutional support and resource availability that were not fully addressed by Terenzini et al. (2001). The study noted that institutional constraints and bureaucratic inefficiencies sometimes hindered the effectiveness of interdisciplinary collaborations, contrasting with Terenzini et al. (2001), who reported generally positive outcomes without considering these local challenges. The Gulu study's findings on these constraints provide a more nuanced view of the factors affecting the success of interdisciplinary research, thus contributing to a more comprehensive understanding of the impact of institutional factors on collaborative efforts. In addition, Brown and Wilson (2018) and Higgins and Smith (2022) also supported the role of interdisciplinary collaborations in enhancing critical thinking skills. Brown and Wilson (2018) highlighted how interdisciplinary teamwork enhances research capabilities and critical analysis, while Higgins and Smith (2022) emphasized the importance of collaborative research in promoting intellectual growth. The Gulu study intersects with their findings by demonstrating how institutional support and resource availability impact the effectiveness of interdisciplinary projects. This alignment underscores the importance of addressing institutional constraints to optimize the benefits of collaborative scholarly activities.

The Gulu University study underscores that access to advanced tools and methodologies through academic collaborations substantially enhances graduate students' research capabilities and critical thinking skills. The study revealed that specialized resources, such as advanced technological tools and methodologies, significantly improved students' ability to tackle complex research questions, fostering deeper critical analysis. Anderson-Cook et al. (2019) supports this finding, showing that interdisciplinary collaborations involving advanced technological tools enable students to address intricate research problems more effectively. Anderson highlights how such tools facilitate a more profound engagement with research topics, mirroring the Gulu study's emphasis on enhanced critical thinking through specialized resources. Nguyen et al. (2024) further corroborate these results by noting that sophisticated equipment and methodologies in collaborative settings expand students' analytical capacities, aligning with the study's findings on the importance of advanced tools. Sulewski et al. (2021) also observed that access to specialized databases and tools through academic partnerships broadens students' investigative scope, reinforcing the Gulu study's conclusions about the value of these resources. Yun et al. (2025) echo this sentiment, demonstrating that cutting-edge research resources enhance students' engagement in complex analyses, thus developing critical thinking skills. These perspectives collectively validate the Gulu study's assertion that access to advanced tools is crucial for intellectual and analytical development.

The Gulu University study highlights the significance of shared resources and knowledge exchange in enhancing critical thinking skills. Collaborative environments that pool educational materials and research findings were shown to enrich students' learning experiences and foster a deeper engagement with academic content. González (2024) corroborates this finding by illustrating that collaborative environments involving resource sharing significantly enhance students' learning experiences and critical thinking capabilities. Peters et al. (2024) supports this

view by emphasizing that exposure to diverse perspectives and methodologies through academic collaborations encourages integrative analysis, thus enhancing critical thinking. Bell et al. (2018) observed similar outcomes, noting that collaborative efforts involving shared research findings and educational materials lead to a richer pool of information and improved critical thinking. Harris et al. (2021) also found that knowledge exchange provides students with broader perspectives, fostering deeper engagement with research topics. These studies align with the Gulu study's emphasis on the critical role of shared resources in developing analytical skills and intellectual growth.

This study highlights how expertise exchanges between institutions and scholars play a pivotal role in fostering critical thinking. Direct interactions with experts were shown to significantly enhance students' problem-solving abilities and analytical skills. Brown and Wilson (2018) demonstrated that workshops and seminars involving expert feedback significantly enhance students' analytical skills and critical thinking, which supports the Gulu study's finding about the importance of expertise exchanges. Robinson et al. (2020) found that collaborative projects involving experienced professionals challenge students to refine their arguments and approach problems from new perspectives, further validating the study's conclusions. O'Reilly et al. (2022) also supports this view, noting that engaging with complex problems through expertise exchanges fosters critical thinking. Hallé et al. (2021) highlight the transformative impact of expert interactions on students' problem-solving abilities, aligning with the Gulu study's findings on the role of expertise exchanges in developing critical thinking skills.

The Gulu University study emphasizes the benefits of interdisciplinary teamwork for critical thinking development. Collaborative projects involving multiple disciplines are shown to enhance students' problem-solving and analytical skills by integrating diverse perspectives. Terenzini et al. (2001) argue that interdisciplinary collaborations promote critical thinking by

integrating diverse perspectives, which supports the Gulu study's focus on interdisciplinary teamwork. Thomas and Drew (2022) also found that interdisciplinary projects encourage students to synthesize knowledge from different fields, enhancing their problem-solving skills. Yates (2023) supports this by showing that interdisciplinary teamwork helps students navigate and integrate diverse methodologies, fostering a holistic understanding of complex issues. S. Walker et al. (2023) observed that such projects significantly contribute to critical thinking by requiring engagement with various perspectives and approaches, aligning with the Gulu study's findings on the importance of interdisciplinary teamwork.

In conclusion, the study at Gulu University provides valuable insights into the role of academic collaborations in fostering critical thinking among graduate students. However, the Gulu study also introduces new dimensions, including the need for contextually relevant resources, the alignment of mentorship with research needs, and the impact of institutional constraints. These findings highlight the importance of tailoring collaborative practices to specific educational contexts and offer a more nuanced understanding of how academic collaborations can be optimized for global educational advancement. By addressing gaps in the literature and providing targeted insights into graduate education, the Gulu study contributes significantly to the ongoing discourse on enhancing critical thinking through academic collaborations.

5.1.3 The Role of Guided Facilitations in Promoting Critical Thinking Skills among Graduate Student at Gulu University

The current study at Gulu University underscored the critical role of guided facilitation in enhancing graduate students' critical thinking skills. This section examines the impact of peer review support, facilitator guidance, structured facilitation frameworks, and technology

integration, and cross-references these findings with recent literature to highlight both alignments and divergences.

The current study found that peer review support at Gulu University significantly enhanced critical thinking by creating structured environments for constructive critique. This finding aligns with Nicol and Macfarlane-Dick (2006) work, which emphasized that peer feedback fosters critical analysis by promoting rigorous critique processes. Nicol and Macfarlane-Dick demonstrated that peer review not only improves students' work quality but also encourages deeper engagement with the material. Recent studies further support this perspective. Hansen (1972) observed that structured peer review processes led to notable improvements in students' evaluative skills and critical thinking. Their research highlighted that structured peer review promotes cognitive development by requiring students to critically assess and provide feedback on their peers' work, thus enhancing active engagement. Zhang et al. (2020) extended this by showing that well-structured peer review sessions, including detailed feedback and active engagement, significantly improved students' critical thinking and writing skills. The current study builds on these findings by offering specific examples of how detailed facilitation strategies, such as feedback mechanisms, can optimize peer review to foster critical thinking, addressing gaps in earlier research.

The role of facilitator support in guiding students through their critical thinking journey was another crucial finding. This supports Biggs et al. (2022) emphasis on structured facilitation, which enhances student engagement and comprehension through clear guidance, scaffolding, and probing questions. Biggs and Tang argued that these elements collectively foster deeper analytical skills. Recent research reinforces this perspective. Røed et al. (2023) demonstrated that facilitators employing specific questioning techniques and personalized feedback significantly improved students' analytical skills and learning outcomes. Nguyen et al. (2020) similarly found

that structured facilitation not only improved students' understanding but also their ability to engage in critical analysis. Both studies align with the current study's findings by highlighting the importance of targeted facilitator support. The current study extends Biggs et al. (2022) framework by incorporating recent advancements in facilitation techniques, showing how specific facilitation strategies can be optimized to enhance critical thinking.

The current study highlighted the importance of a structured facilitation framework for promoting cognitive growth and ensuring consistency in instructional delivery. This aligns with the principles of systematic instructional design discussed by Gorbunova et al. (2023), who emphasized that well-structured instructional frameworks improve learning outcomes by managing cognitive load and providing clear guidance. Recent advancements further support this view. Williams and Hodges (2023) found that systematic instructional frameworks, which included structured learning activities and consistent feedback, significantly improved students' cognitive engagement and critical thinking. Their research highlighted that a well-designed framework promotes deeper understanding by offering clear guidelines and consistent support. The current study extends these principles by providing specific examples of how structured facilitation can be effectively implemented at Gulu University. This approach incorporates recent insights from Williams and Hodges (2023) offering a more nuanced understanding of instructional design and its impact on critical thinking.

The integration of technology into facilitation strategies was another key finding of the current study. This aligns with Yu (2022), who highlighted the benefits of technology-enhanced learning environments for fostering critical thinking. Garrison et al. demonstrated that digital platforms for peer review and feedback improved students' critical thinking by providing interactive and collaborative learning experiences. Kimmons and Jensen (2023) further supported this view, showing that technology-enhanced facilitation, including digital tools for

feedback and collaboration, led to significant improvements in critical thinking skills. The current study's focus on technology integration extended these findings by providing specific examples of how digital tools were used in guided facilitation at Gulu University. This practical application of technology provided valuable insights into how digital tools can complement traditional methods and enhance critical thinking, aligning with recent literature on the benefits of technology-enhanced learning.

The Gulu University study demonstrated that peer review support significantly improved graduate students' critical thinking skills. Structured peer review environments facilitated constructive critique, allowing students to engage deeply with their peers' work. This approach helped students develop evaluative skills and encouraged critical reflection on their own work. The findings align with Nicol and Macfarlane-Dick's (2006) argument that peer feedback fosters critical analysis by promoting rigorous critique processes. Nicol and Macfarlane-Dick showed that peer review not only improves the quality of students' work but also encourages deeper engagement with the material. Recent studies support these conclusions. Neal et al. (2021) found that structured peer review processes led to significant improvements in students' evaluative skills and critical thinking.

Similarly, Zhang, Li, and Wang (2018) demonstrated that detailed feedback in peer review sessions markedly enhanced students' critical thinking and writing skills. These perspectives are echoed by Wilson and McCormick (2022), who observed that structured peer review environments enhance critical thinking by providing detailed feedback and promoting engagement. Zhao and Liao (2024) further confirm that peer review fosters improved analytical skills among students, supporting the current study's emphasis on detailed facilitation strategies in optimizing peer review.

This study highlighted that facilitator guidance was crucial in developing students' critical thinking skills. Effective facilitators provided structured support and feedback, which helped students navigate complex problems and refine their analytical skills through tailored feedback and strategic questioning. Tan et al. (2022) emphasized that effective facilitation fosters critical thinking through reflective practices and strategic questioning. This view is supported by Strickland (2019), who highlighted that structured facilitator support enhances problem-solving abilities and critical analysis. Recent research by Nesbit et al. (2021) further confirms that targeted facilitator guidance improves students' analytical skills and learning outcomes. Ilie (2022) similarly found that strategic questioning and tailored feedback are essential for developing critical thinking. The Gulu study corroborates these findings by illustrating how effective facilitator support can significantly nurture critical thinking skills through structured guidance and feedback.

The study found that structured facilitation frameworks were key in promoting critical thinking among graduate students. These frameworks provided clear guidelines and processes for engaging with academic content, helping students develop systematic approaches to problem-solving and analysis. Biggs et al. (2022) argued that well-designed frameworks support deep learning and critical thinking by providing clear structures for students. Hattie and Timperley (2007) also noted that effective feedback and structured frameworks enhance students' abilities to critically assess and improve their work. Recent studies by Chew and Cerbin (2021) reinforce this view, showing that systematic instructional frameworks improve cognitive engagement and critical thinking. Miner-Romanoff et al. (2019) further support this by demonstrating that structured facilitation frameworks enhance problem-solving skills and critical thinking through systematic instructional design. The Gulu study aligns with these perspectives, illustrating how structured facilitation frameworks effectively facilitate critical thinking.

The study highlighted that integrating technology into facilitation strategies enhanced critical thinking skills. Tools such as online discussion platforms and collaborative software provided additional resources and opportunities for engaging with academic content, supporting students' analytical development. Harris (2023) emphasized the benefits of technology-enhanced learning environments for fostering critical thinking. Y. Zhang et al. (2024) supported this by showing that technology-enhanced learning environments promote deeper analysis and critical thinking. Selwyn (2016) explored how digital tools facilitate critical engagement by providing diverse resources and collaborative opportunities. Similarly, Kimmons and Jensen (2023) found that technology-enhanced facilitation, including digital tools for feedback and collaboration, led to significant improvements in critical thinking skills. Y. Zhang et al. (2024) further confirmed that technology integration supports critical thinking by offering practical applications of digital tools. The Gulu study's focus on technology aligns with these findings, demonstrating how digital tools can complement traditional methods and enhance critical thinking.

Finally, the current study emphasized the importance of longitudinal research to assess the long-term impacts of facilitation strategies on critical thinking skills. This perspective aligns with Kuh et al. (2017), who advocated for exploring the enduring effects of educational practices. Kuh et al. argued that longitudinal studies are crucial for understanding the long-term impacts of educational interventions. The current study extended Kuh et al.'s (2017) framework by focusing specifically on the long-term benefits of guided facilitation. This approach highlighted the need for ongoing assessment to ensure the sustained impact of facilitation strategies on critical thinking skills. By suggesting further research into optimizing facilitation methods for lasting educational benefits, the study provided a valuable direction for future investigations, addressing gaps in the literature.

The current study at Gulu University provided comprehensive insights into the role of guided facilitation in enhancing critical thinking skills among graduate students. The findings aligned with recent literature on peer review support, facilitator guidance, and structured facilitation frameworks while extending these insights by incorporating practical examples and addressing research gaps. The integration of technology and the emphasis on longitudinal impacts further enriched the discussion, highlighting the need for continuous adaptation and evaluation of facilitation strategies. Future research should focus on optimizing facilitation methods, incorporating emerging technologies, and exploring long-term outcomes to further advance critical thinking skills in educational settings.

5.2 Conclusions of the Study

5.2.1 The Role of Case Scenarios in Nurturing Critical Thinking Skills among Graduate Students at Gulu University

The study demonstrates that integrating case scenarios into the curriculum at Gulu University has substantially enhanced critical thinking skills among graduate students. Engaging with these scenarios effectively bridged the gap between theoretical knowledge and practical application, improving students' analytical and problem-solving abilities while promoting active participation and deeper engagement. These positive outcomes underscore the value of case scenarios as pedagogical tools for fostering critical thinking.

However, several critical gaps identified in the literature remain unaddressed. Specifically, the lack of cultural and contextual diversity in case scenarios, disparities in technological access, and unresolved logistical and administrative challenges were not fully tackled in the study. These gaps highlight limitations in the current implementation of case scenarios, suggesting that their effectiveness is constrained by ongoing issues. To fully realize the potential of case scenarios, future efforts must focus on incorporating more diverse and

inclusive scenarios, ensuring equitable access to technological resources, and addressing logistical and administrative barriers. By addressing these unresolved gaps, educators can enhance the overall impact of case scenarios on critical thinking development and better prepare graduate students for the complexities of their professional fields.

5.2.2 The Role of Academic Collaborations in Fostering Critical Thinking Skills among Graduate Students at Gulu University

The study affirmed that academic collaborations, including group projects, peer reviews, and collaborative research, significantly enhanced critical thinking skills among graduate students at Gulu University. These collaborative activities effectively promoted the consideration of diverse perspectives, facilitated reflective dialogue, and supported cooperative problem-solving, thus contributing to intellectual growth and the development of analytical abilities. The positive outcomes demonstrated the effectiveness of these collaborations in fostering a richer learning environment and preparing students for professional challenges.

However, several critical gaps identified in the literature were not fully addressed by the study. Specifically, there remained a notable disconnect between theoretical models and practical constraints, insufficient cultural and contextual diversity, disparities in access to technological resources, and ongoing logistical and administrative challenges. These unresolved issues highlighted that while academic collaborations offered valuable benefits, their effectiveness was constrained by these gaps. Future efforts should focus on bridging the gap between theory and practice, enhancing inclusivity in collaborative activities, ensuring equitable access to technology, and improving administrative processes to fully realize the potential of academic collaborations in fostering critical thinking skills.

5.2.3 The Role of Guided Facilitations in Promoting Critical Thinking Skills among Graduate Students at Gulu University

Based on the findings from this study, guided facilitations were shown to significantly contribute to the enhancement of critical thinking skills among graduate students. The structured support provided through targeted questions, constructive feedback, and supportive interactions effectively helped students focus their thinking, question assumptions, and refine their reasoning processes. This demonstrates that guided facilitations play a crucial role in bridging theoretical knowledge with practical application, thereby enriching students' understanding and analytical abilities.

However, several critical gaps identified in the literature were not addressed by this study. Specifically, the integration of cultural and contextual diversity into guided facilitation methods was not explicitly examined, leaving a gap in understanding how these methods reflect diverse socio-economic and cultural contexts. Additionally, the study did not address the issue of oversimplified or outdated scenarios used in role-playing, nor did it tackle disparities in technological resources or logistical and administrative challenges that could impact the effectiveness of guided facilitation. These unresolved issues suggest that while guided facilitation is effective in promoting critical thinking, its full potential is limited by ongoing gaps related to scenario complexity, inclusivity, and practical constraints. Future research and practice should focus on addressing these gaps to further enhance the effectiveness and relevance of guided facilitation methods in developing critical thinking skills.

5.3 Contributions of the Study

5.3.1 Contribution to the existing Body of Knowledge

The study offers significant scholarly contributions to the existing body of knowledge in several key areas. First, it provides empirical evidence supporting the integration of case scenarios into graduate curricula, demonstrating their effectiveness in enhancing critical thinking skills by linking theoretical knowledge with practical application. This contribution reinforces the theoretical framework that case scenarios are essential for bridging the gap between academic learning and real-world problem-solving.

Second, the study advances our understanding of the role of academic collaborations in fostering critical thinking. It confirms that group projects, peer reviews, and collaborative research activities are instrumental in promoting diverse perspectives, reflective dialogue, and cooperative problem-solving, thereby contributing to the development of analytical abilities and intellectual growth among students. This finding adds depth to the literature on collaborative learning by highlighting its impact on critical thinking and professional readiness.

Third, the study underscores the value of guided facilitation in nurturing critical thinking skills. By revealing how structured support through targeted questioning and feedback enhances students' reasoning and application of knowledge, it supports the theoretical notion that guided facilitation is crucial for developing deeper cognitive skills.

Additionally, the study identifies and clarifies critical gaps in the literature, such as cultural and contextual mismatches, technological disparities, and logistical challenges, thus providing a nuanced understanding of current limitations and setting a foundation for future research. Collectively, these contributions enrich the scholarly discourse on educational strategies and offer practical insights for improving the effectiveness of teaching methods in developing critical thinking among graduate students.

5.3.2 Contribution to the Philosophical School of Thought

The study contributes to Critical Theory by highlighting and addressing systemic issues within educational practices that perpetuate inequalities. By critiquing the limitations of current case scenarios, academic collaborations, and guided facilitation methods, it challenges traditional structures and emphasizes the need for inclusivity and relevance. The findings advocate for incorporating diverse cultural perspectives, updating content to reflect real-world complexities, and ensuring equitable access to resources, aligning with Critical Theory's focus on transforming educational systems to promote social justice and equity. This contribution enriches Critical Theory by providing practical insights into how educational practices can be reformed to address structural inequities and better serve diverse student populations.

5.4 Recommendations of the Study

5.4.1 Recommendation to Policy Makers

Policy makers should continue to emphasize the integration of case scenarios that bridge the gap between theoretical knowledge and practical application, as this approach has demonstrated significant improvements in critical thinking skills. This positive development suggests that policies should support the continuous updating of educational materials to include diverse and contemporary issues, thereby enhancing the relevance and effectiveness of case scenarios. However, policy makers need to address the ongoing gaps related to cultural and

contextual diversity, technological inequities, and logistical challenges. Policies should be crafted to ensure that educational resources are inclusive and representative of diverse backgrounds and that all students have equitable access to necessary technological tools. Additionally, policies should address administrative inefficiencies to facilitate the smooth implementation of educational interventions.

5.4.2 Recommendation to Policy Implementers

Policy implementers should build on the success of integrating case scenarios and guided facilitation by ensuring that these methods are applied consistently across educational settings. Positive recommendations include providing support and resources to update and diversify case scenarios, and ensuring that these materials are effectively utilized in the curriculum. Implementers should also focus on addressing gaps that remain unaddressed, such as disparities in access to technological resources and logistical and administrative challenges. To mitigate these negative aspects, implementers should develop strategies to enhance technological access for all students and streamline administrative processes to support the effective management of educational programs.

5.4.3 Future Research Area

Future research should investigate how diverse and contextually relevant case scenarios impact critical thinking and learning outcomes, as positive results have already been observed in these areas. Research could focus on further refining and validating the effectiveness of these scenarios across different disciplines and student populations. Additionally, future studies should address the negative gaps not fully explored in the current research, such as the integration of cultural and contextual diversity in guided facilitation methods and the impact of technological disparities on learning. Research should also examine strategies for overcoming logistical and administrative barriers to the successful implementation of educational interventions. By

addressing these unresolved issues, future research can contribute to optimizing educational practices and enhancing the development of critical thinking skills among students.

5.5 Limitations of the Study

The study was limited to qualitative methods, such as interviews and focus groups, which, while offering rich, detailed insights, did not include quantitative data to triangulate findings or assess broader applicability This was strategically chosen to maintain a clear focus on the research objectives and to ensure that the findings were directly applicable to the context. Future studies might address this limitation by incorporating diverse educational settings, employing mixed-methods approaches, and extending the timeframe for a more comprehensive evaluation of the interventions' long-term effects.

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Appendices

Appendix A: Consent Form

Dear Participant,

This consent form seeks your permission to conduct an audio-visual recording as part of a research study for educational purposes. By signing, you consent to the recording of your image, voice, likeness, and statements. The recordings will be kept confidential, and your personal information will not be disclosed without your explicit consent, except as required by law.

Your consent is valid for the study's duration and related activities. If the recordings are used for other purposes in the future, additional consent will be sought. You have the right to withdraw your consent at any time by notifying the researcher in writing. Materials collected before withdrawal will still be used as initially agreed.

If you have any questions, please contact the me using the provided telephone number and email address.

By signing, you acknowledge that you:

- Understand the purpose of the audio-visual recording.
- Voluntarily agree to participate and grant consent for the use of the recordings.
- Understand your right to withdraw consent at any time.

Participant's Code Name: _____Participant's Pseudo Signature: _____Date: _____

Appendix B: Interview Guide for Lecturers

Research question one: How do case scenarios nurture critical thinking skills among graduate students at Gulu University?

I asked open ended questions aim to elicit detailed, reflective responses from lecturers about their perceptions and experiences with using case scenarios to nurture critical thinking skills among graduate students.

1. Perceptions of Critical Thinking:
    - How do you define critical thinking in the context of graduate education?
    - In your experience, how important is critical thinking for graduate students, particularly in the Master of Education Management program?
    - Can you provide examples of how you have observed critical thinking manifest in your students?
2. Nature of Case Scenarios:
    - How are case scenarios typically designed and implemented in your courses?
    - What key elements do you consider when developing case scenarios to enhance critical thinking skills?
    - How do you ensure that the case scenarios are relevant and challenging for the students?
3. Examples of Case Scenarios:
    - Can you describe some specific case scenarios that you have used in your teaching?
    - How have these case scenarios been received by the students?
    - Could you share any particular case scenario that stood out in terms of its impact on students' critical thinking skills?
4. Case Scenarios and Critical Thinking Skills:
    - In what ways do you believe case scenarios contribute to the development of critical thinking skills?
    - Can you share an instance where a case scenario significantly enhanced a student’s critical thinking abilities?
    - What are some of the challenges you face when using case scenarios to nurture critical thinking skills?

5. Critical Thinking Skills in Graduate Students:
    - Based on your observations, what are the most critical thinking skills that graduate students develop through case scenarios?
    - How do you measure the improvement in critical thinking skills among your students?
    - In your opinion, what other teaching methods could complement case scenarios in fostering critical thinking?

Research Question 2: How do academic collaborations foster critical thinking skills among graduate students at Gulu University?

These questions were designed to gather in-depth insights from lecturers about their experiences and perspectives on the role of academic collaborations in fostering critical thinking skills among graduate students.

1. Perceptions of Critical Thinking:
    - How do you define critical thinking within the context of academic collaborations among graduate students?
    - What are your views on the importance of critical thinking skills in collaborative academic settings?
2. Nature of Academic Collaborations:
    - How are academic collaborations typically structured in the Master of Education Management program?
    - What are the key elements that make these collaborations effective in enhancing critical thinking?
3. Examples of Academic Collaborations:
    - Can you provide examples of successful academic collaborations that have taken place in your courses?
    - How did these collaborations specifically contribute to the development of critical thinking skills among the students?
4. Academic Collaborations and Critical Thinking Skills:
    - In what ways do you believe academic collaborations help in fostering critical thinking skills?
    - Can you share any particular instance where an academic collaboration significantly enhanced a student's critical thinking abilities?
5. Critical Thinking Skills in Graduate Students:

- Based on your observations, what critical thinking skills do graduate students develop through academic collaborations?
- How do you assess the improvement in critical thinking skills as a result of these collaborations?
- What challenges do you encounter in facilitating academic collaborations aimed at nurturing critical thinking skills?

Research question 3: How do guided facilitations promote critical thinking skills among graduate students at Gulu University?

These questions were designed to gather in-depth insights from lecturers about their experiences and perspectives on the role of guided facilitation in promoting critical thinking skills among graduate students.

1. Perceptions of Critical Thinking:
    - How do you define critical thinking in the context of guided facilitations for graduate students?
    - How important do you consider critical thinking skills to be in the learning process facilitated by guided facilitations?
2. Nature of Guided Facilitations:
    - How are guided facilitations typically implemented in your courses?
    - What strategies do you use to ensure these facilitations effectively promote critical thinking?
3. Examples of Guided Facilitations:
    - Can you describe specific instances of guided facilitations you have conducted?
    - How did these guided facilitations help in enhancing students' critical thinking skills?
4. Guided Facilitations and Critical Thinking Skills:
    - In what ways do you believe guided facilitations contribute to the development of critical thinking skills?
    - Can you share an example where guided facilitation notably improved a student’s critical thinking abilities?
5. Critical Thinking Skills in Graduate Students:

- Based on your experience, what critical thinking skills do graduate students develop through guided facilitations?
- How do you measure the effectiveness of guided facilitations in improving critical thinking skills?
- What challenges do you face in using guided facilitations to nurture critical thinking skills?

Appendix C: Interview Guide for Graduates

Research Question 1: How do case scenarios nurture critical thinking skills among graduate students at Gulu University?

These questions aim to provide a comprehensive understanding of the graduate students' perspectives and experiences, offering valuable insights into the effectiveness of case scenarios in nurturing critical thinking skills at Gulu University

1. Perceptions of Critical Thinking:

- How would you define critical thinking in the context of your graduate education?
- How important do you believe critical thinking was for your success in the Master of Education Management program?
- Can you provide examples of how you demonstrated critical thinking during your studies?

2. Nature of Case Scenarios:

- How were case scenarios presented and used in your courses?
- What aspects of the case scenarios did you find most effective in enhancing your critical thinking skills?
- Were there any particular challenges you faced when working with case scenarios? How did you overcome them?

3. Examples of Case Scenarios:

- Can you describe a specific case scenario that you worked on during your program?
- How did this case scenario impact your learning and critical thinking development?
- Which case scenario stood out to you the most and why?

4. Case Scenarios and Critical Thinking Skills:

- In what ways do you believe case scenarios contributed to your critical thinking skills?
- Can you recall an instance where a case scenario significantly enhanced your critical thinking abilities?
- What were some of the obstacles you faced while engaging with case scenarios, and how did you address them?

5. Critical Thinking Skills in Graduate Students:

- What specific critical thinking skills do you believe you developed through working on case scenarios?
- How did your instructors assess your improvement in critical thinking skills?
- What other teaching methods, in your opinion, complemented case scenarios in fostering your critical thinking?

Research Question 2: How do academic collaborations foster critical thinking skills among graduate students at Gulu University?

These questions aim to provide a comprehensive understanding of the graduate students' perspectives and experiences, offering valuable insights into the effectiveness of academic collaborations in fosteringg critical thinking skills at Gulu University

1. Perceptions of Critical Thinking:

- How would you define critical thinking within the context of your academic collaborations during your graduate studies?
- How important were critical thinking skills in your collaborative academic experiences?

2. Nature of Academic Collaborations:

- How were academic collaborations structured in your program?
- What key elements made these collaborations effective in enhancing your critical thinking?

3. Examples of Academic Collaborations:

- Can you provide examples of successful academic collaborations you were involved in?
- How did these collaborations contribute to the development of your critical thinking skills?

4. Academic Collaborations and Critical Thinking Skills:

- In what ways do you believe academic collaborations helped in fostering your critical thinking skills?
- Can you share an instance where an academic collaboration significantly enhanced your critical thinking abilities?

5. Critical Thinking Skills in Graduate Students:

- What critical thinking skills do you believe you developed through academic collaborations?
- How was the improvement in your critical thinking skills assessed during these collaborations?

- What challenges did you encounter in academic collaborations aimed at nurturing critical thinking skills?

Research Question 3: How do guided facilitations promote critical thinking skills among graduate students at Gulu University?

These questions aim to provide a comprehensive understanding of the graduate students' perspectives and experiences, offering valuable insights into the effectiveness of guided facilitations in nurturing critical thinking skills at Gulu University

1. Perceptions of Critical Thinking:

- How would you define critical thinking in the context of guided facilitations for graduate students?
- How important were critical thinking skills in the learning process facilitated by guided facilitations?

2. Nature of Guided Facilitations:

- How were guided facilitations implemented in your courses?
- What strategies did your instructors use to ensure these facilitations effectively promoted critical thinking?

3. Examples of Guided Facilitations:

- Can you describe specific instances of guided facilitations you participated in?
- How did these guided facilitations enhance your critical thinking skills?

4. Guided Facilitations and Critical Thinking Skills:

- In what ways do you believe guided facilitations contributed to your critical thinking skills?
- Can you share an example where guided facilitation notably improved your critical thinking abilities?

5. Critical Thinking Skills in Graduate Students:

- What critical thinking skills do you believe you developed through guided facilitations?
- How did your instructors measure the effectiveness of guided facilitations in improving your critical thinking skills?
- What challenges did you face during guided facilitations that were aimed at nurturing your critical thinking skills?

Appendix D: Interview Guide for Graduate Students

This interview guide aims to gather comprehensive insights from graduate students at Gulu University regarding their experiences with case scenarios, academic collaborations, and guided facilitations in nurturing critical thinking skills.

Research Question 1: How do case scenarios nurture critical thinking skills among graduate students at Gulu University?

1. Perceptions of Critical Thinking:

- How would you define critical thinking in the context of your graduate education?
- How important do you believe critical thinking was for your success in the Master of Education Management program?
- Can you provide examples of how you demonstrated critical thinking during your studies?

2. Nature of Case Scenarios:

- How were case scenarios presented and used in your courses?
- What aspects of the case scenarios did you find most effective in enhancing your critical thinking skills?
- Were there any particular challenges you faced when working with case scenarios? How did you overcome them?

3. Examples of Case Scenarios:

- Can you describe a specific case scenario that you worked on during your program?
- How did this case scenario impact your learning and critical thinking development?
- Which case scenario stood out to you the most and why?

4. Case Scenarios and Critical Thinking Skills:

- In what ways do you believe case scenarios contributed to your critical thinking skills?
- Can you recall an instance where a case scenario significantly enhanced your critical thinking abilities?
- What were some of the obstacles you faced while engaging with case scenarios, and how did you address them?

5. Critical Thinking Skills in Graduate Students:

- What specific critical thinking skills do you believe you developed through working on case scenarios?
- How did your instructors assess your improvement in critical thinking skills?
- What other teaching methods, in your opinion, complemented case scenarios in fostering your critical thinking?

Research Question 2: How do academic collaborations foster critical thinking skills among graduate students at Gulu University?

1. Perceptions of Critical Thinking:

- How would you define critical thinking within the context of your academic collaborations during your graduate studies?
- How important were critical thinking skills in your collaborative academic experiences?

2. Nature of Academic Collaborations:

- How were academic collaborations structured in your program?
- What key elements made these collaborations effective in enhancing your critical thinking?

3. Examples of Academic Collaborations:

- Can you provide examples of successful academic collaborations you were involved in?
- How did these collaborations contribute to the development of your critical thinking skills?

4. Academic Collaborations and Critical Thinking Skills:

- In what ways do you believe academic collaborations helped in fostering your critical thinking skills?
- Can you share an instance where an academic collaboration significantly enhanced your critical thinking abilities?

5. Critical Thinking Skills in Graduate Students:

- What critical thinking skills do you believe you developed through academic collaborations?
- How was the improvement in your critical thinking skills assessed during these collaborations?
- What challenges did you encounter in academic collaborations aimed at nurturing critical thinking skills?

Research Question 3: How do guided facilitations promote critical thinking skills among graduate students at Gulu University?

1. Perceptions of Critical Thinking:

- How would you define critical thinking in the context of guided facilitations for graduate students?
- How important were critical thinking skills in the learning process facilitated by guided facilitations?

2. Nature of Guided Facilitations:

- How were guided facilitations implemented in your courses?
- What strategies did your instructors use to ensure these facilitations effectively promoted critical thinking?

3. Examples of Guided Facilitations:

- Can you describe specific instances of guided facilitations you participated in?
- How did these guided facilitations enhance your critical thinking skills?

4. Guided Facilitations and Critical Thinking Skills:

- In what ways do you believe guided facilitations contributed to your critical thinking skills?
- Can you share an example where guided facilitation notably improved your critical thinking abilities?

5. Critical Thinking Skills in Graduate Students:

- What critical thinking skills do you believe you developed through guided facilitations?
- How did your instructors measure the effectiveness of guided facilitations in improving your critical thinking skills?
- What challenges did you face during guided facilitations that were aimed at nurturing your critical thinking skills?

Appendix E: Document Checklist

1. Academic Journals:
    - Look for peer-reviewed journals that focus on education, higher education, or specifically on problem-based learning and critical thinking. Examples include:
        - Journal of Problem-Based Learning in Higher Education
        - Journal of Critical Thinking and Educational Research
2. University Publications:
    - Check if Gulu University has published any reports, theses, or dissertations related to problem-based learning and critical thinking. University databases or repositories may be useful.
3. Course Syllabi:
    - Examine the syllabi of graduate courses at Gulu University, especially those in programs where problem-based learning and critical thinking are emphasized. This can provide insights into the curriculum design.
4. Research Reports:
    - Look for any institutional or research reports related to education and learning outcomes at Gulu University. These reports might contain data and analysis relevant to your topic.
5. Conference Proceedings:
    - Explore proceedings from conferences on education and pedagogy. Presentations and papers from conferences may offer insights into current practices and research in problem-based learning and critical thinking.
6. Books and Book Chapters:
    - Search for books and book chapters written by experts in the field of education and critical thinking. These can provide a more in-depth understanding of the theories and practical applications.
7. Educational Websites and Platforms:
    - Explore educational websites, online platforms, or repositories that focus on teaching and learning. They may offer resources, case studies, or articles related to problem-based learning and critical thinking.
8. Surveys and Assessment Tools:

- Look for any surveys or assessment tools that have been used to measure problem-based learning and critical thinking skills among graduate students. This can help you understand the evaluation methods employed.

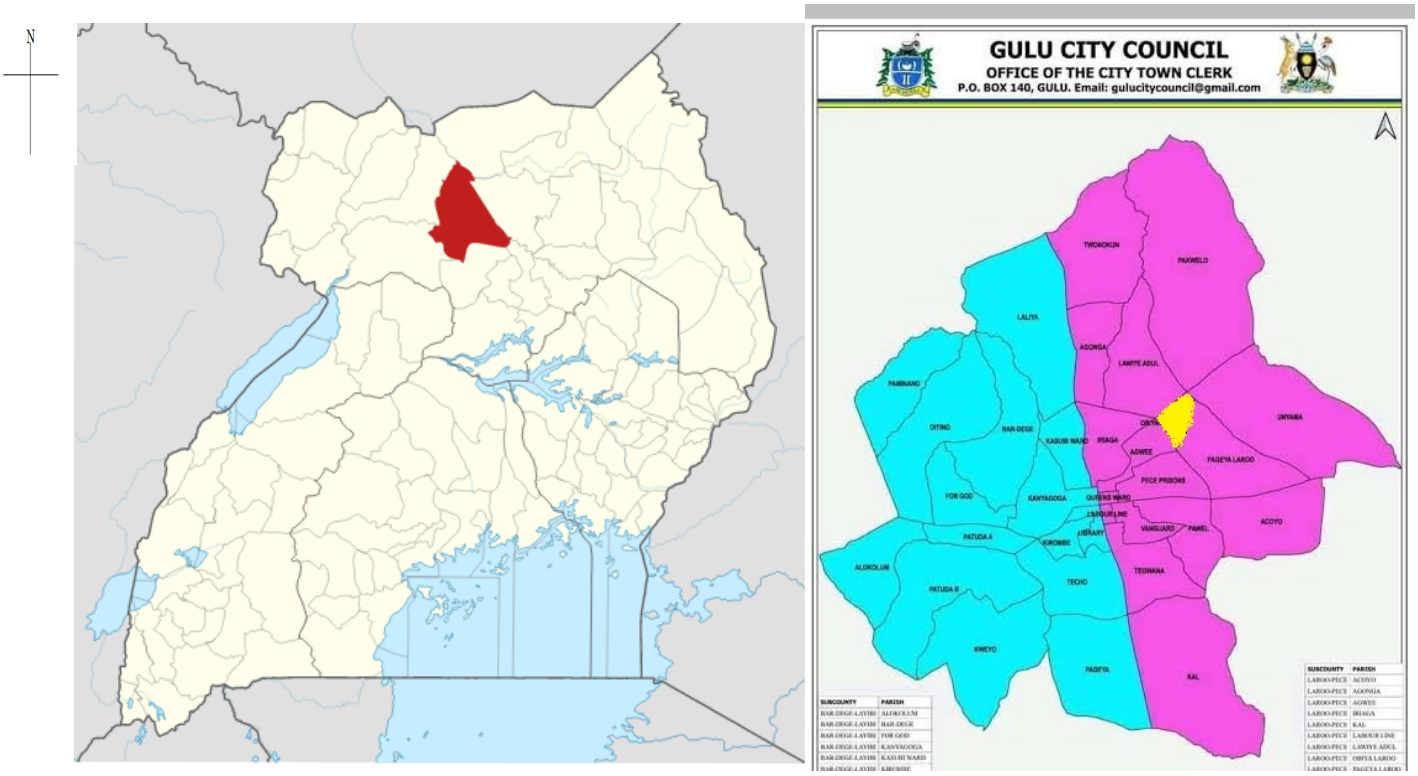
9. Interviews and Case Studies:

    - If available, review any interviews or case studies conducted at Gulu University regarding the implementation of problem-based learning and the development of critical thinking skills.

10. Educational Research Databases:

    - Utilize educational research databases such as ERIC (Education Resources Information Center) to find scholarly articles, reports, and other resources related to your research topic.

Appendix F: Sketch Maps of Uganda and Gulu City Showing the Study Location



Key 1

Gulu City

Key 2

Gulu University

Appendix G: Report on Plagiarism Check

GULU UNIVERSITY
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PLAGIARISM CHECK

Declaration for Originality Form
This form must be completed and signed for all scholarly work produced.

Name: MS LAMARO GLORIA

Personal File No.(staff) Reg. (student).___ 2021/HD04/2802U

Faculty/Institute: EAST AFRICAN SCHOOL OF HIGHER EDUCATION STUDIES AND DEVELOPMENT, COLLEGE OF EDUCATION AND EXTERNAL STUDIES, MAKERERE UNIVERSITY

Department:____ EDUCATION MANAGEMENT

Title and bibliographic description of the work
PROBLEM BASED LEARNING AND HOW IT ENHANCES CRITICAL THINKING SKILLS AMONG GRADUATE STUDENTS AT GULU UNIVERSITY

Declaration.

1. I understand what plagiarism is and I am aware of the University policy on this regard.
2. I declare that this …Proposal… (thesis, dissertation, essay, assignment, paper, report etc.) is my original work and has not been submitted elsewhere for examination, award of a degree or publication. Where other people's work or my work has been used, this has been properly acknowledged and referenced in accordance with Gulu University requirements.
3. I have not sought or used the services of any professional agency to produce this work.
4. I have not allowed, and shall not allow anyone to copy my work with the intention of passing it off as his/her own.
5. I understand that any false claim of this work shall result in disciplinary action in accordance with University Policy on Plagiarism.

Signature _____ Date June 10, 2023

Originality Report

The article/thesis/document titled above have been subjected to plagiarism check and the level was found to be…… 15% (percent) this is classified as:

- ✓ **Minor**
- ☐ Moderate
- ☐ Serious

Yours sincerely,

Dr. Ongaya Kizito (PhD)
Ag. University Librarian

Appendix H: Introductory Letter

MAKERERE UNIVERSITY
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COLLEGE OF EDUCATION AND EXTERNAL STUDIES
East African School of Higher Education Studies and Development
Office of the Dean

22nd November 2023

TO WHOM IT MAY CONCERN

Lamaro Gloria – Reg. No. 2021/HD04/2802U is our Doctor of Philosphy student who is collecting data for her dissertation titled: **"Problem-based learning and how it enhances critical thinking skills among students at Gulu University".**

We shall be grateful if you could render assistance to her in collecting the necessary data for her dissertation.

The East African School of Higher Education Studies and Development thanks you in advance for your assistance.

Julius Kikooma, PhD.
Ag. Dean

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