

Making Uncertainty Productive in EFL Writing: The Curiosity Loop as an Inquiry-Based Pedagogy

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ABSTRACT

Background. Curiosity is increasingly recognized as an important driver of engagement in EFL learning; however, its role in academic writing instruction, particularly in helping students manage uncertainty, develop arguments, and revise ideas, remains underexplored. University EFL learners need learning experiences that encourage questioning, sustained inquiry, and reflective meaning construction rather than dependence on immediate lecturer explanations.

Purpose. This study aimed to explore the implementation of the Curiosity Loop in an Essay Writing course, focusing on students' experiences of wondering, grappling, and discovering, the forms of engagement that emerged, and the pedagogical opportunities and challenges associated with its implementation.

Methods. This study employed a classroom-based qualitative case study involving 18 third-semester students of the English Education Study Program at Universitas Muhammadiyah Enrekang. The Curiosity Loop was implemented across eight 100-minute meetings. Data were collected through classroom observations, reflective journals, student-generated inquiry records, writing artifacts, and semi-structured individual interviews with six purposively selected students. The data were analyzed using reflexive thematic analysis supported by deductive and inductive coding.

Results. The findings showed that students gradually moved from answer-seeking questions toward more analytical inquiry involving evidence, justification, alternative perspectives, and argument revision. Grappling became productive when supported by appropriate linguistic and pedagogical scaffolding, while discovery was reflected most clearly in substantive revisions of ideas and arguments. The process also facilitated cognitive, behavioral, emotional, and social engagement, although linguistic limitations, unequal participation, and time demands remained challenges.

Conclusion. The Curiosity Loop can provide a practical inquiry-oriented framework for EFL academic writing by helping students use curiosity, uncertainty, evidence, interaction, and revision as resources for developing more reflective and defensible arguments.

KEYWORDS

Academic writing; curiosity; EFL learning; inquiry-based learning; learner engagement; productive struggle

INTRODUCTION

English as a Foreign Language (EFL) education in higher education is increasingly expected to move beyond the transmission of vocabulary, grammatical rules, and predetermined language forms. University learners are required to use English to interpret information, formulate questions,

negotiate meanings, articulate arguments, evaluate evidence, and communicate ideas across academic and social contexts. These expectations place learner engagement, agency, and active knowledge construction at the center of contemporary language pedagogy. Active learning is not simply characterized by visible classroom activity; rather, it involves students cognitively

engaging with ideas, making decisions, interacting with content, and taking greater responsibility for learning (Doolittle et al., 2023). In EFL settings, engagement similarly operates across behavioral, cognitive, emotional, social, and collaborative dimensions, making meaningful participation more complex than merely increasing the amount of student talk (Nakamura et al., 2021; Yuyun, 2023; Mafulah & Cahyono, 2023).

This multidimensional nature of engagement has important implications for university EFL teaching. Students may appear behaviorally active while remaining cognitively dependent on teacher explanations, or they may complete assigned tasks without experiencing genuine intellectual investment. Conversely, opportunities to make choices, formulate interpretations, negotiate with peers, and revise ideas can create qualitatively different forms of engagement. Nakamura et al. (2021), for example, demonstrated among university EFL learners that task conditions providing greater learner choice affected several dimensions of task engagement, particularly cognitive engagement. Indonesian research likewise indicates that EFL engagement is shaped by how opportunities for interaction, feedback, collaboration, and reflection are designed rather than by participation alone (Yuyun, 2023; Mafulah & Cahyono, 2023). These findings suggest that a central pedagogical question is not merely whether students participate, but what enables them to inquire, persist, and construct meaning through English.

One construct that provides a potentially powerful explanation for this form of intellectual engagement is curiosity. Within second language acquisition, language-learning curiosity has been conceptualized as a domain-relevant disposition that encourages learners to seek new linguistic knowledge, explore uncertainty, and pursue information capable of resolving gaps in understanding (Mahmoodzadeh & Khajavy, 2019). More recent classroom research has strengthened this perspective. Nakamura et al. (2022) identified several antecedents of

epistemic curiosity among university EFL learners, including novelty, personal relevance, comprehensibility, and conditions that generated a meaningful desire to know. Fraschini and Tao (2023) further demonstrated that epistemic curiosity was positively associated with learners' perceived value of language learning and intended effort. Collectively, these findings position curiosity not merely as a stable individual characteristic, but as an epistemic emotion that can influence how learners respond to uncertainty and invest effort in language learning.

Evidence linking curiosity to specific language-learning outcomes is also emerging. Choi and Lee (2024) found positive associations between language-learning curiosity and vocabulary knowledge among university-level English learners, while Paradowski and Jelińska (2024) identified curiosity as part of the psychological network associated with persistence and L2 grit in online foreign-language learning. Research in university ESL contexts has additionally begun to explore how curiosity can guide the selection and use of reading materials. Gunawardane et al. (2025) reported that different thematic categories elicited different levels of curiosity among undergraduate learners, demonstrating that curiosity can be shaped by the relevance and characteristics of learning materials. In a related intervention, Gunawardane and Matthews (2025) found more nuanced effects of curiosity-based reading on summary-writing performance: curiosity-oriented materials did not produce uniformly superior gains across all measures, although advantages emerged in particular dimensions of writing quality. Such findings caution against treating curiosity as an automatic cause of improved achievement. Its educational value depends on how an initial desire to know is translated into sustained cognitive, linguistic, and communicative activity.

This distinction is particularly important because language learning takes place within a complex emotional ecology. Enjoyment may support willingness to

communicate and achievement, whereas boredom and anxiety can interfere with attention, persistence, and participation. A meta-analysis by Botes et al. (2022) confirmed meaningful relationships between foreign-language enjoyment and several learning variables, including willingness to communicate and academic achievement. Dewaele et al. (2023) likewise demonstrated interconnected relationships among enjoyment, anxiety, boredom, teacher behavior, and language achievement. Li's (2021) investigation of university EFL learners further showed that boredom is closely associated with learners' appraisals of control and value, suggesting that emotional engagement is partly shaped by instructional experience rather than exclusively by stable learner characteristics. Curiosity therefore needs to be situated within this broader motivational and emotional system. Stimulating initial interest alone may be insufficient unless learners are subsequently provided with meaningful opportunities to explore uncertainty, engage with challenging ideas, and experience the gradual construction of understanding.

Inquiry-Based Learning (IBL) provides an instructional architecture capable of translating curiosity into structured learning activity. Inquiry-oriented approaches generally position learners as active investigators who identify or engage with problems, formulate questions, gather and evaluate information, test interpretations, communicate explanations, and reflect on emerging understanding. Pedaste et al. (2015), through a systematic synthesis of inquiry models, identified orientation, conceptualization, investigation, conclusion, and discussion as central phases of an inquiry cycle, with questioning, communication, and reflection embedded throughout the process. Importantly, inquiry should not be equated with minimally guided discovery. Lazonder and Harmsen's (2016) meta-analysis demonstrated that appropriate guidance significantly facilitates inquiry activities, performance, and learning outcomes. Productive inquiry therefore requires an intentional balance between

learner autonomy and pedagogical scaffolding.

This principle is particularly relevant to EFL learning because students simultaneously investigate ideas through language and investigate language itself. When learners explore a text, controversial issue, authentic problem, cultural phenomenon, or communicative situation, English functions both as the medium and the object of inquiry. Students need to formulate questions, seek information, negotiate meanings, select vocabulary, test linguistic expressions, challenge interpretations, defend viewpoints, and revise their communication. Inquiry thus creates opportunities to integrate language development with critical thinking and meaning construction. Empirical evidence supports this potential. Wale and Bishaw (2020) reported that inquiry-based EFL writing instruction enhanced dimensions of undergraduate learners' critical-thinking abilities. Stepanechko and Kozub (2022) similarly found that inquiry-oriented, technology-enabled English learning supported comprehension, communication, critical thinking, collaboration, and curiosity among university students.

Evidence from Indonesian higher education further reinforces this potential. Kasmaini and Zahrida (2022) reported improvements in students' writing performance and classroom activity following the implementation of inquiry-based learning among undergraduate English education students. Kamaruddin et al. (2023) similarly demonstrated that IBL contributed to EFL students' critical-thinking development in argumentative writing, particularly in interpretation, analysis, inference, evaluation, explanation, and self-regulation. More recent research has expanded attention beyond cognitive outcomes toward affective dimensions. Castro-Carracedo (2026), for instance, examined IBL in higher-education EFL learning and reported benefits associated with motivation and foreign-language anxiety. Taken together, these studies demonstrate that inquiry may contribute to linguistic,

cognitive, motivational, and affective dimensions of university EFL learning.

Nevertheless, a critical examination of this body of literature reveals an important conceptual and empirical gap. A substantial proportion of inquiry-oriented EFL studies has concentrated on learning outcomes, including writing achievement, critical thinking, communication, motivation, and anxiety. Comparatively less attention has been directed toward the learning processes through which curiosity develops into sustained inquiry. Existing research establishes that language learners can experience curiosity and that inquiry-based instruction can generate desirable outcomes; however, these two strands are not always analytically integrated. In particular, limited attention has been given to what students experience between the emergence of a question and the construction of understanding. This intermediate space is pedagogically important because learners must tolerate uncertainty, explore incomplete knowledge, compare competing possibilities, and attempt linguistic expression before more consolidated understanding becomes available.

The importance of this intermediate phase is supported by research on productive failure and supported struggle. Sinha and Kapur's (2021) meta-analysis showed that, under appropriate instructional conditions, engaging learners in problem solving before explicit instruction can produce learning advantages over instruction-first sequences. The educational value, however, lies neither in failure itself nor in leaving students unsupported. Productive cognitive effort requires appropriately challenging tasks, opportunities to generate and compare possible representations or explanations, and subsequent instructional consolidation. This principle converges with inquiry research emphasizing the role of appropriate scaffolding (Lazonder & Harmsen, 2016) and with evidence that inquiry-oriented environments can support conceptual development when learners are encouraged to confront and investigate misconceptions (Siantuba et al., 2023).

Within EFL learning, such productive cognitive effort can assume distinctive linguistic and communicative forms. Students may struggle to articulate an emerging idea, select between alternative interpretations of a text, evaluate the credibility of information, organize supporting evidence, choose appropriate linguistic resources, or defend an argument for which they initially possess incomplete language. Such moments should not automatically be viewed as instructional failure. When appropriately supported, they can become spaces for noticing, hypothesis formation, meaning negotiation, peer explanation, linguistic experimentation, argument development, and revision. Student-generated questioning is particularly significant in this respect because asking questions externalizes uncertainty and provides direction for subsequent inquiry. Yu and Cheng (2022) demonstrated that procedural support can influence the quality of student-generated questions, indicating that questioning itself benefits from thoughtful instructional scaffolding rather than simply being requested by the teacher.

The literature therefore points toward three closely interconnected learning experiences that warrant greater attention in university EFL education: wondering, grappling, and discovering. Wondering reflects learners' intellectual responses to information gaps, contradictions, unfamiliar ideas, or meaningful problems; grappling captures the supported intellectual and linguistic effort involved in investigating, interpreting, negotiating, and revising emerging ideas; and discovering represents the gradual consolidation of understanding through evidence, interaction, reflection, and pedagogical guidance. These processes are theoretically compatible with scholarship on epistemic curiosity, inquiry-based learning, productive cognitive effort, student-generated questioning, and learner engagement (Pedaste et al., 2015; Lazonder & Harmsen, 2016; Mahmoodzadeh & Khajavy, 2019; Sinha & Kapur, 2021; Nakamura et al., 2022; Fraschini & Tao, 2023). However, their interconnected operation within authentic university EFL

classroom practice remains insufficiently examined.

This gap is especially relevant to academic writing instruction. Essay writing requires learners not only to demonstrate grammatical and lexical competence but also to generate ideas, formulate positions, organize arguments, examine supporting evidence, consider alternative perspectives, and revise claims. These processes inherently involve uncertainty, intellectual negotiation, and iterative meaning construction. Yet writing instruction may become overly procedural when students are provided with topics, structures, model arguments, and corrective explanations before they have sufficient opportunities to question assumptions, investigate ideas, and construct positions independently. Inquiry-oriented writing therefore provides a productive context for examining how curiosity, intellectual struggle, and discovery interact with the development of written English.

The Indonesian higher-education context provides an important setting for such investigation. Previous Indonesian studies have demonstrated that learner engagement is responsive to instructional interaction, feedback, and learning design (Yuyun, 2023; Mafulah & Cahyono, 2023), while inquiry-based approaches have demonstrated potential for strengthening writing performance and critical thinking among EFL undergraduates (Kasmaini & Zahrida, 2022; Kamaruddin et al., 2023). Nevertheless, relatively little empirical attention has been devoted to how curiosity, supported intellectual effort, meaning negotiation, and discovery are experienced as interconnected elements of English-learning activity. Consequently, the issue is no longer limited to determining whether inquiry-based learning can improve a particular language skill. An equally important question concerns how students experience inquiry itself and what pedagogical conditions enable uncertainty to become productive engagement rather than confusion, passivity, or withdrawal.

This issue is particularly relevant for students in the English Education Study

Program at Universitas Muhammadiyah Enrekang, where English is studied not only as a language of communication but also as part of students' preparation for future professional roles in English language education. Within the Essay Writing course, students are expected to develop coherent ideas, formulate arguments, examine and use evidence, organize perspectives, and communicate these ideas effectively in written English. These academic demands make the course an appropriate context for examining how inquiry can encourage students to move beyond reproducing teacher-provided models toward actively questioning, exploring, negotiating, and refining ideas through English.

The present study therefore focuses on the Curiosity Loop as an analytical and pedagogical perspective for understanding curiosity-driven inquiry among undergraduate students of the English Education Study Program. Rather than treating curiosity simply as an individual motivational variable or inquiry-based learning merely as a classroom technique, the study examines how students experience uncertainty, engage in intellectual and linguistic effort, negotiate meaning, develop emerging understanding, and extend their questioning within authentic Essay Writing activities. This perspective seeks to connect affective, cognitive, behavioral, social, and pedagogical dimensions that have often been investigated separately in previous EFL studies.

Accordingly, this study aims to explore the implementation of the Curiosity Loop in the Essay Writing course of the English Education Study Program at Universitas Muhammadiyah Enrekang, with particular attention to students' experiences of wondering, grappling, and discovering; the forms of engagement emerging during these experiences; and the pedagogical opportunities and challenges associated with its implementation. Conceptually, the study seeks to contribute to current discussions on curiosity, inquiry, learner engagement, and active EFL learning by examining how these dimensions intersect within authentic classroom practice.

Practically, the study is expected to provide a contextually grounded perspective for EFL educators seeking to design academic writing experiences in which questioning, uncertainty, exploration, linguistic effort, reflection, and discovery function as meaningful resources for learning.

The study addresses the following research questions:

RQ1: How do undergraduate students of the English Education Study Program experience the processes of *wondering*, *grappling*, and *discovering* during the implementation of the Curiosity Loop in Essay Writing learning?

RQ2: How does the Curiosity Loop facilitate students' cognitive, behavioral, emotional, and social engagement in Essay Writing learning?

RQ3: What pedagogical opportunities and challenges emerge from implementing the Curiosity Loop in the Essay Writing classroom at Universitas Muhammadiyah Enrekang?

METHOD

Design

This study employed a qualitative classroom-based case study to explore the implementation of the Curiosity Loop in university EFL learning. The design was selected because the study focused on how students experienced and participated in the processes of wondering, grappling, discovering, and renewed wondering, rather than on measuring the statistical effect of an intervention. The classroom was treated as a bounded case in which the Curiosity Loop was integrated into regular Essay Writing instruction. The study adopted an interpretive orientation. Attention was directed to students' experiences of curiosity and uncertainty, their efforts to negotiate ideas and construct meaning, manifestations of cognitive, behavioral, emotional, and social engagement, and the pedagogical opportunities and challenges that emerged during implementation.

Participants and Setting

The study was conducted at Universitas Muhammadiyah Enrekang, South Sulawesi, Indonesia, involving 18 third-semester undergraduate students from the English Education Study Program who were enrolled in the Essay Writing course. The participants constituted an intact classroom group and experienced the same instructional activities as part of their regular academic program. The class was selected purposively because the Essay Writing course requires students to generate ideas, formulate and develop arguments, examine supporting evidence, organize perspectives coherently, and revise written expression. These characteristics made the course particularly appropriate for the implementation of inquiry-oriented learning and for exploring students' experiences of curiosity, intellectual struggle, and meaning construction in EFL learning. All 18 students participated in the classroom activities and contributed classroom-based data. For the individual interviews, six students were purposively selected to represent variations in classroom participation and engagement during the implementation of the Curiosity Loop. Participant identities were anonymized using codes such as S1, S2, and S3 throughout the processes of data analysis and reporting.

Curiosity Loop Instructional Framework

The instructional framework consisted of four recursively connected processes:

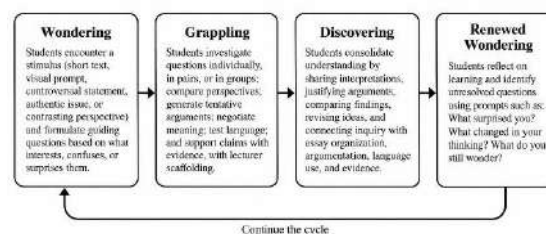


Figure 1. Curiosity loop instructional framework

In the *wondering* stage, students encountered a stimulus such as a short text, visual prompt, controversial statement, authentic issue, or contrasting perspective related to an essay topic. Rather than immediately receiving explanations,

students were encouraged to identify what interested, confused, or surprised them and formulate questions that could guide further exploration.

During *grappling*, students investigated their questions individually, in pairs, or in small groups. They explored information, compared perspectives, generated tentative arguments, negotiated meaning, tested linguistic expressions, and supported claims with evidence. The lecturer provided scaffolding through guiding questions, vocabulary support, clarification, examples, and additional resources without immediately resolving the problem for students.

The *discovering* stage involved consolidating emerging understanding. Students shared interpretations, justified arguments, compared findings, revised ideas, and connected their inquiry with relevant principles of essay organization, argumentation, language use, and evidence. Lecturer feedback was provided to clarify misconceptions and strengthen conceptual and linguistic understanding.

Finally, *renewed wondering* encouraged students to reflect on what they had learned and identify questions that remained unresolved. Prompts such as *What surprised you?*, *What changed in your thinking?*, and *What do you still wonder?* were used to extend inquiry beyond a single learning episode.

Instruments

Four sources of qualitative data were used: classroom observations, student reflective journals, student-generated inquiry records, and semi-structured individual interviews.

Classroom observations documented students' questioning, interaction, use of evidence, negotiation of meaning, revision of ideas, responses to difficulty, collaboration, and emerging engagement. Field notes included both descriptive classroom events and reflective analytical notes.

Student reflective journals were completed following selected Curiosity Loop activities. Students responded to prompts concerning what stimulated their curiosity, what they found difficult, how they responded to

uncertainty, what they discovered, how their thinking changed, and what they still wanted to know.

Student-generated inquiry records consisted of questions developed during the wondering and renewed-wondering stages. These records were examined to identify how students' questions developed from initial curiosity toward explanation, comparison, justification, and further investigation.

Semi-structured individual interviews were conducted with six purposively selected students after completion of the instructional sequence. Interview questions explored students' experiences of questioning before receiving explanations, managing difficulty, collaborating through English, receiving lecturer support, revising ideas, experiencing discovery, and developing further curiosity.

The instruments were developed directly from the research questions and the conceptual dimensions of the Curiosity Loop. No external expert validation was conducted.

Data Collection Procedure

Data were collected across eight instructional meetings, with each meeting lasting 100 minutes. The Curiosity Loop was incorporated into regular Essay Writing activities throughout the implementation period. At the beginning of the study, students were introduced to the learning process and informed that questioning, tentative responses, revision, and uncertainty were expected parts of learning. Each instructional episode generally followed the sequence:

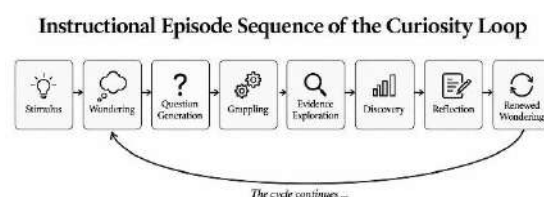


Figure 2. Instructional episode sequence of the curiosity loop

Classroom observations and field notes were produced throughout the eight meetings. Student-generated questions and relevant

learning records were collected during the instructional activities, while reflective journals were completed after selected learning episodes.

Following the eighth meeting, six students participated in semi-structured individual interviews. The interviews provided opportunities to explore experiences that could not be fully captured through direct classroom observation, particularly students' perceptions of curiosity, difficulty, confidence, discovery, and lecturer support. Participation in the research was voluntary, and students were informed that their decision to participate or not participate would not affect their academic grades.

Data Analysis

Data were analyzed using reflexive thematic analysis through a combination of deductive and inductive coding. The deductive analysis was informed by the Curiosity Loop dimensions—wondering, grappling, discovering, and renewed wondering—as well as cognitive, behavioral, emotional, and social engagement. Inductive coding was simultaneously employed to capture unanticipated patterns emerging from the data.

Analysis began with repeated reading of observation notes, reflective journals, inquiry records, and interview transcripts. Meaningful segments were then assigned initial codes such as *expressing uncertainty*, *generating questions*, *seeking evidence*, *negotiating meaning*, *revising an argument*, *persisting with difficulty*, *requesting support*, and *generating new questions*. Related codes were subsequently clustered into candidate themes. Themes were reviewed across the four data sources to identify convergence, variation, and contradiction. Particular attention was given to instances in which

grappling resulted in productive engagement as well as occasions when difficulty led to hesitation, disengagement, or greater dependence on lecturer support. The final themes were refined in relation to the three research questions. Data-source triangulation was used to strengthen interpretive credibility by comparing observable classroom behavior with students' written reflections, inquiry records, and interview accounts.

RESULTS

Data from eight classroom observations, 18 student reflective journals, student-generated inquiry records, writing artifacts, and semi-structured interviews with six purposively selected students were analyzed in relation to the three research questions. The findings were organized into three major areas: students' experiences of wondering, grappling, and discovering; manifestations of student engagement; and pedagogical opportunities and challenges emerging during the implementation of the Curiosity Loop in the Essay Writing course.

Across the eight meetings, 227 student-generated questions were documented. Of these, 124 were classified descriptively as higher-order questions involving explanation, comparison, evaluation, justification, or implication. Classroom observation also recorded 115 evidence-based exchanges, 118 substantive revisions of ideas or arguments, and 126 follow-up or renewed questions. At the same time, lecturer scaffolding episodes decreased from 11 in the first meeting to four in the eighth meeting. These frequencies were used only to describe observable classroom patterns rather than for inferential statistical analysis.

Table 1. Classroom Patterns Across Eight Curiosity Loop Meetings

Meeting	Essay Writing Focus	Questions Generated	Higher-Order Questions	Evidence-Based Exchanges	Argument/Idea Revisions	Renewed Questions	Lecturer Scaffolding
1	AI in Academic Writing	24	6	4	5	8	11
2	Developing an Arguable Thesis	27	10	7	9	11	9
3	Evaluating Evidence and Sources	29	15	14	12	13	8

4	Developing Supporting Paragraphs	26	14	16	13	15	7
5	Counterarguments and Rebuttals	31	19	18	16	18	6
6	Cohesion and Coherence	28	17	15	17	17	6
7	Peer Review and Argument Revision	30	20	21	22	19	5
8	Final Inquiry Essay and Reflection	32	23	20	24	25	4
Total		227	124	115	118	126	56

The observational pattern showed that the number and nature of questions changed over the implementation period. In Meeting 1, only 6 of 24 questions required explanation, evaluation, or comparison, whereas in Meeting 8, 23 of 32 questions reflected these more elaborated forms of inquiry. A similar change was visible in renewed questioning, which increased from eight instances in the first meeting to 25 in the final meeting.

Students' Experiences of Wondering, Grappling, and Discovering

The first research question examined how students experienced wondering, grappling, and discovering during the Curiosity Loop. Three interrelated themes were identified: from answer-seeking to question-driven writing, grappling as supported intellectual effort, and discovering through revision of understanding.

From Answer-Seeking to Question-Driven Writing

During the initial meetings, several students approached questioning primarily as a means of obtaining a correct answer from the lecturer. This pattern was evident during the first topic, *Should university students be allowed to use generative AI in academic writing?* Questions such as *"Is using AI always considered cheating?"* and *"Can AI-generated information be considered evidence?"* reflected students' attempts to establish clear boundaries before constructing arguments.

Observation notes from the first meeting also showed that some students waited for lecturer explanations before contributing their own interpretations. However, this pattern became less dominant across

subsequent meetings. Questions increasingly moved from requests for factual clarification toward examining relationships, evidence, alternative perspectives, and consequences.

For example, during the lesson on thesis development, students asked:

"If evidence contradicts our original thesis, should we change the evidence or the thesis?"

During the lesson on source evaluation, another question emerged:

"If experts disagree, how should a student decide which evidence to use?"

By the final meeting, inquiry extended beyond the immediate essay assignment:

"Does every answer in academic writing eventually generate another question?"

This development was also reflected in students' journals. Fifteen of the 18 reflective journals contained evidence that students increasingly perceived questioning as part of developing an argument rather than simply obtaining information.

Student S14 described a change in confidence:

"Before, I was afraid to ask because maybe my question was not good. Later I realized that a question can help me find what I do not understand."

Similarly, S2 explained during the interview:

"Usually, I expect the lecturer to explain the material and then we practice. Here, sometimes we had to make questions first. It made me think about the problem before thinking about the structure of the essay."

The student-generated inquiry records further indicated that questioning became increasingly connected with argumentative writing. Questions concerning thesis statements, evidence, source credibility, counterarguments, and reader

interpretation appeared progressively across the eight meetings.

Table 2. *Examples of Development in Student-Generated Questions*

Meeting Focus	Initial/Direct Question	More Elaborated or Renewed Question
AI and academic writing	Is using AI always cheating?	If AI produces biased information, who is responsible when students use it?
Thesis development	What makes a thesis arguable?	If evidence contradicts our thesis, should the thesis change?
Source credibility	What makes a source credible?	If experts disagree, how should students decide which evidence to use?
Local agricultural tourism	What benefits can tourism provide?	How can development balance economic growth and cultural sustainability?
English-medium instruction	Does using more English improve proficiency?	Who should determine the balance between English and Indonesian?
Coherence	Are transition words enough?	Is coherence determined more by the writer or the reader?
Peer review	Should we accept all peer suggestions?	How can writers decide which feedback leads to meaningful revision?
Final inquiry	How much evidence is enough?	Does every answer in academic writing generate another question?

The progression was not uniform across all participants. Students such as S3, S4, and S14 remained more comfortable formulating questions in writing or small groups than presenting them immediately in whole-class discussion. Thus, increasing inquiry did not always correspond to increased oral participation.

Grappling as Supported Intellectual and Linguistic Effort

Grappling appeared most clearly when students had an idea but lacked sufficient evidence, vocabulary, organization, or confidence to defend it. During the eight meetings, classroom observations recorded students comparing sources, challenging peer claims, rereading material, modifying thesis statements, and seeking linguistic support.

This process was especially visible during Meetings 3 and 5. In Meeting 3, students evaluated social media posts, news reports, institutional websites, and journal excerpts. Fourteen evidence-based exchanges were documented. Rather than accepting a source because it appeared formal, students increasingly questioned authorship, recency, evidence, and potential bias.

During Meeting 5, students were required to consider arguments both for and against English-medium instruction. Nineteen

higher-order questions and 18 evidence-based exchanges were documented. Students who initially expressed one-sided positions had to consider competing perspectives before constructing rebuttals.

Student S10 described this experience:

"During counterargument activities, I had to defend an opinion different from my own. My essays became less one-sided."

Reflective journals indicated that 14 of the 18 students experienced some form of productive difficulty during the implementation. However, difficulty was not uniformly experienced as positive.

S5 explained:

"At first I felt uncomfortable because I wanted the lecturer to tell us which answer was correct. After discussing with my group, I understood that different answers could be reasonable if we had evidence."

The same student also distinguished intellectual difficulty from linguistic difficulty:

"Sometimes if I did not know the vocabulary, I could not focus on the argument."

Similar experiences were reported by S4 and S10, who noted that formulating complex ideas in English could constrain participation even when they understood the issue conceptually.

The classroom data consequently showed two forms of grappling. The first involved

productive engagement with ideas, such as comparing evidence or reconsidering an argument. The second involved linguistic limitations that sometimes interrupted the inquiry process. Lecturer scaffolding during these moments included vocabulary prompts, guiding questions, clarification, and additional examples.

The frequency of observable lecturer scaffolding decreased across the meetings, from 11 episodes during Meeting 1 to four during Meeting 8. Students increasingly consulted peers, texts, and previously learned strategies before requesting direct explanations.

Discovering through Revision

The clearest evidence of discovering was found in students' revisions rather than in statements of having obtained a correct answer. Across eight meetings, 118 substantive revisions of arguments or ideas were recorded. These involved changes to thesis statements, supporting reasons, evidence, paragraph organization, counterarguments, and interpretations.

During Meeting 2, for instance, an initial thesis statement read:

"Community service is good for students."

Following questioning and peer discussion, the statement was revised to specify the relationship between compulsory community service, civic responsibility, and experiential learning.

A similar pattern appeared in an essay concerning generative AI. One initial thesis stated:

"AI is useful for university students because it makes writing easier."

Following evidence exploration and peer questioning, the thesis was revised as:

"Generative AI can support university students' academic writing when it is used for idea exploration and language feedback, but its use requires explicit boundaries concerning authorship, verification, and academic integrity."

Reflective journals confirmed that revision was increasingly understood as conceptual rather than merely grammatical. Sixteen of 18 students described discovering or revising an aspect of their previous understanding.

S18 wrote:

"Revision used to mean correcting grammar for me. Now I think revision can also mean changing the argument when the evidence does not support it."

S8 similarly reflected:

"I knew the local issue because I live around this area, but I discovered that knowing something from experience is different from proving it in academic writing."

The final stage of several learning episodes also produced new questions. Across eight meetings, 126 renewed questions were documented. These questions frequently arose after students had already clarified an initial problem. Thus, discovering was often accompanied by the identification of further uncertainty rather than the termination of inquiry.

Student Engagement During the Curiosity Loop

The second research question concerned how the Curiosity Loop facilitated cognitive, behavioral, emotional, and social engagement. Evidence for all four dimensions was identified across observations, reflective journals, inquiry records, and interviews.

Table 3. *Manifestations of Student Engagement*

Engagement Dimension	Main Manifestations
Cognitive	Comparing evidence, questioning assumptions, evaluating sources, constructing counterarguments, revising claims
Behavioral	Generating questions, participating in tasks, searching for evidence, drafting, revising, persisting
Emotional	Curiosity, uncertainty, anxiety, frustration, satisfaction, increasing confidence
Social	Peer questioning, collaborative exploration, argument negotiation, feedback, listening, revision through discussion

Cognitive Engagement

Cognitive engagement was visible in students' increasing use of evidence, comparison, justification, and revision. Fifteen of the 18 reflective journals included evidence of movement from obtaining information toward examining reasons or alternative interpretations.

Meeting 3 was particularly significant because students had to distinguish source credibility from agreement with their own opinions. S4 reported:

"I used to think journal articles were automatically objective. I learned that a credible source can still have limitations or a particular perspective."

Students also reconsidered their own assumptions during counterargument activities. Rather than retaining an initial position regardless of evidence, several students modified claims after encountering contradictory information.

Behavioral Engagement

Behavioral engagement appeared through question generation, evidence searching, drafting, peer reviewing, and revision. The observation data showed increased participation across the instructional sequence, although forms of participation differed among students.

Some quieter students contributed more consistently through written questioning and small-group interaction than through whole-class discussion. S4 explained:

"For me, participation increased first through writing and group discussion, not through speaking to the whole class."

The data therefore recorded behavioral engagement through multiple channels rather than relying solely on oral participation.

Emotional Engagement

Students reported a combination of curiosity, uncertainty, discomfort, satisfaction, and increasing confidence. Thirteen of the 18 reflective journals contained references to curiosity coexisting with uncertainty or frustration.

S5 initially interpreted the absence of immediate lecturer explanations as a sign that the task was difficult. Later, the student reported becoming more comfortable with temporary uncertainty. S14 similarly explained:

"Sometimes uncomfortable, but I had more confidence after finding an answer myself."

Emotional responses nevertheless varied. Linguistic difficulty sometimes produced hesitation, particularly when students were required to formulate complex ideas spontaneously in English.

Social Engagement

Peer interaction was present throughout all eight meetings and was mentioned positively in 15 of the 18 reflective journals and all six interviews. Students used peers to test arguments, clarify meanings, challenge assumptions, and identify weaknesses in drafts.

S2 stated:

"Friends often asked questions that showed weaknesses in my argument."

S17, who was highly active in group discussion, reported a different type of learning:

"Inquiry is not only asking and arguing. It is also listening."

Observation records also indicated that peer review became progressively less focused on direct correction. By Meeting 7, students frequently used questions such as "*What evidence supports this sentence?*" and "*What would someone who disagrees say?*" as part of feedback.

Pedagogical Opportunities and Challenges

The third research question examined the opportunities and challenges emerging during implementation. The data identified several recurring opportunities related to question generation, argument development, evidence use, revision, and peer interaction, alongside challenges involving linguistic limitations, unequal participation, scaffolding, and time.

Table 4 *Pedagogical Opportunities and Challenges*

Opportunities	Challenges
Student-generated questions became resources for essay development	Linguistic limitations sometimes restricted expression of complex ideas
Students increasingly used evidence to justify positions	Some students initially depended on lecturer explanations
Counterarguments encouraged reconsideration of initial positions	Whole-class oral participation remained uneven
Peer questions supported substantive revision	Highly active students could dominate discussions
Reflection helped students recognize changes in understanding	Inquiry activities required additional classroom time
Local and authentic issues stimulated questioning	Personal familiarity was sometimes mistaken for sufficient academic evidence

One prominent opportunity concerned the connection between inquiry and idea development. Students were required to establish what they wanted to investigate before focusing exclusively on essay form. As a result, questions became resources for developing thesis statements, supporting arguments, and counterarguments.

The use of locally relevant content was also associated with visible participation. During Meeting 4, the topic of agricultural tourism in Enrekang stimulated discussion based on students' knowledge of the local context. However, the activity also revealed a distinction between familiarity and academic evidence. S8 reflected that personal experience alone did not necessarily substantiate an academic claim.

Peer interaction provided another opportunity. Fifteen reflective journals and all six interviews referred to peer discussion as supporting understanding or revision. However, participation was not evenly distributed. Seven students mentioned unequal oral participation in their reflections, and three interview participants raised related concerns.

S17 acknowledged:

"Sometimes I talked too much. Two friends had good questions but I answered before they finished."

The participant suggested that clearer roles could create greater space for quieter students.

Linguistic constraints were also recurrent. Ten of the 18 reflective journals, four of the

six interviews, and observations from six of the eight meetings contained evidence that vocabulary or spontaneous English production occasionally restricted intellectual participation. Students sometimes possessed an idea but required language support before they could communicate it.

Another challenge was the amount of instructional time required. Nine students referred to time demands in reflective journals, and four interview participants noted that sustained questioning and discussion could reduce the time available for writing. Observation records from five meetings contained similar indications.

The lecturer therefore provided varying degrees of scaffolding across the sessions. Early support often involved vocabulary, additional examples, or explicit guiding questions. Later sessions involved fewer lecturer interventions, although support remained necessary when conceptual difficulty was compounded by linguistic limitations.

The findings showed three broad patterns across the eight Curiosity Loop meetings. First, students' questioning gradually expanded from predominantly answer-seeking questions toward questions concerned with explanation, evidence, evaluation, alternative perspectives, and further inquiry. Their experiences of grappling involved both productive intellectual effort and linguistic difficulty, while discovering was most visibly

represented through substantive revisions of arguments and changes in understanding. Second, cognitive, behavioral, emotional, and social engagement were evident in different but overlapping forms. Students evaluated evidence, participated through multiple modes, experienced both curiosity and uncertainty, and increasingly used peer interaction to refine their thinking.

Third, the implementation provided opportunities for inquiry-driven idea development, evidence-based argumentation, peer-supported revision, and reflection. At the same time, linguistic limitations, unequal participation, continuing reliance on scaffolding among some students, and instructional time remained observable challenges. These findings form the basis for interpreting the Curiosity Loop in relation to inquiry-based EFL learning, epistemic curiosity, productive struggle, and academic writing in the subsequent Discussion section.

DISCUSSION

The present study explored how undergraduate students in the English Education Study Program experienced the Curiosity Loop during an Essay Writing course, how different forms of engagement emerged during its implementation, and what pedagogical opportunities and challenges accompanied the process. Three broad findings are particularly noteworthy. First, students gradually moved from predominantly answer-seeking questions toward questions that supported argument development, evidence evaluation, comparison, and continued inquiry. Second, grappling with uncertainty appeared productive when students had sufficient intellectual space to investigate ideas while receiving appropriately calibrated linguistic and pedagogical support. Third, discovery was most clearly reflected not in students simply reaching a correct answer but in their willingness to revise claims, reconsider evidence, reorganize arguments, and acknowledge changes in their understanding. These processes were accompanied by cognitive, behavioral, emotional, and social engagement, although

linguistic limitations, unequal participation, and instructional time remained important constraints.

Curiosity as a Starting Point for Academic Writing

One of the most salient findings was the qualitative development of students' questioning. At the beginning of the implementation, many questions were directed toward obtaining definitive information from the lecturer. As the learning experiences progressed, students increasingly generated questions concerning reasons, credibility, competing interpretations, consequences, and the sufficiency of evidence. This development suggests that curiosity in academic writing may become pedagogically significant when it is connected to a problem that students genuinely need to resolve rather than treated merely as initial interest.

This interpretation is consistent with research on epistemic curiosity in language learning. Nakamura et al. (2022) found that novelty, relevance, comprehensibility, and knowledge gaps can contribute to the emergence of epistemic curiosity in L2 classrooms. Fraschini and Tao (2023) similarly demonstrated that epistemic curiosity is associated with learners' perceived value of language learning and intended effort. The present findings extend this perspective by suggesting that, in Essay Writing, curiosity can become visible through the questions students construct around their developing arguments. Curiosity therefore appeared not merely as a feeling of interest but as an observable orientation toward identifying what needed to be investigated before a defensible argument could be written.

The movement from simple information-seeking questions toward more elaborated questions also resonates with the broader logic of inquiry-based learning. Pedaste et al. (2015) conceptualized inquiry as involving orientation, conceptualization, investigation, conclusion, and discussion, with questioning connecting several of these processes. The current study suggests that this inquiry orientation can be meaningfully transferred to university EFL writing, where

the problem to be investigated is not necessarily scientific but argumentative: students must determine what they believe, why a claim is defensible, what evidence supports it, what opposing position exists, and what remains uncertain.

Importantly, increased questioning did not mean that every student became equally vocal. Several students preferred to formulate questions individually or in small groups before participating in whole-class discussion. This finding highlights the need to distinguish inquiry engagement from oral visibility. A quiet learner may still be cognitively engaged through writing, reading, reflection, or small-group negotiation. This observation is compatible with Nakamura et al. (2021), who demonstrated that L2 task engagement is multidimensional and can be influenced by the degree of learner choice available within a task. It also aligns with Indonesian evidence showing that engagement in EFL settings can manifest differently across instructional conditions and interactional modes (Yuyun, 2023).

Grappling as Productive but Supported Difficulty

A second central finding concerns students' experiences when answers were not immediately available. Grappling involved searching for evidence, comparing perspectives, defending tentative positions, negotiating meanings, and attempting to express complex thoughts with limited linguistic resources. The findings indicate that temporary uncertainty could become intellectually productive, but only under particular conditions.

This pattern is consistent with Sinha and Kapur's (2021) meta-analysis of productive failure, which demonstrated that problem solving before explicit instruction can produce learning advantages when it is appropriately designed and followed by instructional consolidation. The relevance of this principle to the present study lies not in encouraging failure itself but in recognizing that premature explanation may remove opportunities for learners to generate, test, and reconsider ideas. The students' experiences suggest that having to work

through uncertainty before receiving complete clarification created opportunities for more substantive engagement with arguments and evidence.

At the same time, the findings clearly indicate that grappling should not be romanticized. Students reported occasions when linguistic limitations prevented them from concentrating on the underlying argument. Difficulty resulting from competing evidence could stimulate thought, whereas difficulty caused by the inability to express an existing idea in English could sometimes inhibit participation. This distinction is pedagogically important. Productive cognitive challenge and unnecessary linguistic overload are not equivalent.

The decreasing frequency of lecturer scaffolding across the eight meetings can therefore be interpreted cautiously as evidence that students became increasingly able to continue inquiry using peers, sources, and previously developed strategies. It should not be interpreted as evidence that teacher support became unnecessary. Lazonder and Harmsen's (2016) meta-analysis showed that guidance improves inquiry learning processes and outcomes, challenging interpretations of inquiry as unguided discovery. In the present context, effective support appeared to involve giving students enough assistance to continue thinking without replacing the thinking itself.

This finding also helps clarify the pedagogical role of the lecturer within the Curiosity Loop. The lecturer did not simply withdraw from instruction. Instead, the role shifted according to students' needs—from designing meaningful uncertainty, to providing questions and linguistic scaffolds, to facilitating conceptual consolidation. Thus, learner-centered inquiry did not imply teacher absence; rather, it required more deliberate decisions about when to intervene, what kind of support to provide, and when to withhold an immediate answer.

Discovery as Revision Rather Than Answer Acquisition

A third important finding is that discovery was most clearly represented through revision. Students altered thesis statements, reconsidered evidence, modified counterarguments, reorganized paragraphs, and occasionally changed their positions after encountering new information. This pattern suggests that discovering in academic writing should not be reduced to finding a predetermined correct answer. It may instead involve recognizing inadequacies in one's previous understanding and producing a more defensible interpretation.

This is particularly significant for EFL writing pedagogy. Students sometimes approach revision primarily as correcting grammar, vocabulary, or mechanics. In the present study, however, reflections such as S18's recognition that revision could involve changing an argument when evidence no longer supported it indicated a broader conception of revision as epistemic development. Students were not merely improving language forms; they were reconstructing meaning.

The finding corresponds with previous inquiry-based EFL writing research. Wale and Bishaw (2020), working with undergraduate EFL students in argumentative writing, found that inquiry-based instruction supported critical-thinking development. Kamaruddin et al. (2023) similarly reported that inquiry-based learning contributed to EFL learners' critical-thinking skills in argumentative writing, including interpretation, analysis, inference, evaluation, explanation, and self-regulation. Indonesian research by Kasmiani and Zahrida (2022) also reported improvements in student activity and writing performance through inquiry-based learning. The present findings complement these outcome-oriented studies by illuminating a possible classroom process underlying such development: students question an assumption, encounter competing information, negotiate uncertainty, and subsequently revise the argument.

The findings also add nuance to previous work because not every revision represented deeper thinking. Some changes resulted from linguistic clarification or direct feedback. Consequently, revision itself should not automatically be treated as evidence of discovery. The stronger evidence occurred when students could articulate why a claim changed—for example, because new evidence contradicted an assumption, peer questions revealed an unsupported inference, or a reader interpreted the argument differently from what the writer intended.

Interconnected Forms of Student Engagement

The implementation also revealed that engagement operated across cognitive, behavioral, emotional, and social dimensions rather than as a single classroom condition. Cognitive engagement appeared through evaluating evidence, considering alternatives, and revising arguments; behavioral engagement was reflected in questioning, searching, drafting, and revising; emotional engagement included curiosity, uncertainty, frustration, and growing confidence; and social engagement was visible through peer questioning and meaning negotiation.

The coexistence of curiosity and discomfort is particularly notable. Students did not necessarily become engaged because uncertainty disappeared. In several instances, engagement occurred through uncertainty. Fraschini and Tao (2023) similarly found that epistemic curiosity and epistemic anxiety are distinct and can coexist within language-learning experiences. The present study therefore challenges a simplistic assumption that successful inquiry should always feel comfortable. Some uncertainty may be educationally valuable provided learners perceive the task as manageable and meaningful.

This emotional complexity is also consistent with research showing that second-language learning involves interconnected positive and negative emotions. Dewaele et al. (2023) demonstrated relationships among foreign-language enjoyment, anxiety, boredom,

teacher behaviors, and achievement, emphasizing that classroom emotion is shaped partly by instructional conditions. More recent evidence from Castro-Carracedo (2026) indicates that inquiry-based EFL instruction may also contribute to motivation while reducing foreign-language anxiety. However, the present findings suggest that the goal of inquiry should not necessarily be the complete removal of anxiety or difficulty. A more realistic pedagogical goal is to create conditions in which uncertainty remains tolerable and actionable rather than becoming debilitating.

Social engagement played an equally important role. Peer questions frequently exposed weaknesses in arguments that individual writers had not recognized. By Meeting 7, peer review had begun to shift from correcting language toward asking writers to justify evidence or reconsider assumptions. This pattern supports previous findings that interaction and feedback can contribute meaningfully to EFL writing engagement. Mafulah and Cahyono (2023), for example, found active student engagement with feedback in an Indonesian university EFL writing context and emphasized the importance of attending to both cognitive and affective dimensions.

Nevertheless, social interaction also introduced a challenge: participation was uneven. More confident students could dominate discussion, while less confident students sometimes required writing time or smaller interactional settings before contributing. Therefore, collaborative inquiry cannot simply be equated with placing students into groups. The structure of participation matters. Roles, wait time, written pre-discussion reflection, rotating spokespersons, and question-generation tasks may be necessary to ensure that intellectual space is distributed more equitably.

Implications for Inquiry-Based EFL Writing

The findings have several implications for understanding inquiry in EFL academic writing. First, they suggest that inquiry may contribute to writing not only by improving a final textual product but by altering how

students arrive at what they write. Previous research has established the potential of inquiry-based learning for EFL critical thinking, writing development, communication, and active learning (Wale & Bishaw, 2020; Stepanechko & Kozub, 2022; Kamaruddin et al., 2023). The present study adds a process-oriented perspective by showing how questioning, temporary uncertainty, peer negotiation, and conceptual revision can become integrated into essay development.

Second, the findings suggest that academic writing instruction may benefit from delaying some forms of explicit instruction until students have encountered a meaningful need for them. For example, teaching counterarguments after students have struggled to defend a one-sided claim may give rhetorical concepts greater functional relevance. Similarly, discussing source credibility after students encounter conflicting information may make source evaluation more meaningful than presenting credibility criteria abstractly before students have experienced the problem.

This does not mean abandoning explicit teaching. Instead, direct instruction can be strategically positioned after or during inquiry, when learners have developed questions to which formal knowledge provides meaningful answers. Such an approach is consistent with evidence from productive-failure research and inquiry-learning research emphasizing the complementary relationship between learner exploration and instructional guidance (Lazonder & Harmsen, 2016; Sinha & Kapur, 2021).

Third, the findings indicate that language scaffolding deserves particular attention when inquiry is implemented in EFL contexts. A task may be cognitively appropriate but linguistically inaccessible. Teachers therefore need to distinguish between giving students conceptual answers and providing the linguistic resources necessary for them to continue investigating. Vocabulary banks, sentence starters for disagreement and justification, short model expressions, source-evaluation prompts, and opportunities to rehearse an

idea in pairs may preserve intellectual challenge while reducing avoidable linguistic barriers.

Theoretical Contribution of the Curiosity Loop

Conceptually, the findings provide preliminary support for viewing curiosity-driven EFL inquiry as an interconnected process rather than treating curiosity, inquiry, engagement, and writing development as separate phenomena. Existing inquiry frameworks describe phases of inquiry and emphasize investigation and discussion (Pedaste et al., 2015), curiosity research explains learners' desire to resolve knowledge gaps (Fraschini & Tao, 2023; Nakamura et al., 2022), and productive-failure research demonstrates the potential value of appropriately structured initial struggle (Sinha & Kapur, 2021). The present study brings these perspectives into conversation within the specific setting of university EFL writing.

The contribution should nevertheless be stated cautiously. The findings do not establish the Curiosity Loop as a universal or causal model, nor do they demonstrate that each student necessarily progressed through identical processes. Instead, the data suggest that wondering, grappling, and discovering provide analytically useful lenses for understanding how curiosity-driven inquiry was experienced in this particular EFL writing classroom. One significant feature was that discovery frequently generated additional questions. This indicates that learning was not always experienced as a movement toward closure; greater understanding sometimes made students more aware of complexity.

This recursive quality may distinguish the Curiosity Loop from classroom approaches in which inquiry ends once students locate a correct response. For academic writing, such openness is especially relevant because complex arguments rarely terminate uncertainty completely. Stronger evidence often reveals limitations, competing interpretations, and questions requiring further investigation. In this sense, the value of curiosity may lie not only in motivating students to start learning but also in

enabling them to continue interrogating what they think they already understand.

Limitations and Alternative Explanations

Several limitations should qualify the interpretation of these findings. First, the study involved only 18 third-semester English Education students from one Essay Writing class at Universitas Muhammadiyah Enrekang. The small, context-specific sample is appropriate for an in-depth qualitative case study but limits generalization to other universities, proficiency levels, courses, or EFL populations.

Second, the implementation lasted eight meetings. This duration allowed recurring classroom patterns to be observed but cannot establish whether changes in questioning, independence, or engagement would persist over a longer period. Increased familiarity with classmates, essay-writing tasks, or course expectations may also have contributed to some observed changes independently of the Curiosity Loop.

Third, interpretation relied partly on students' reflective journals and interviews. These sources provide access to experiences that cannot be directly observed, but they remain susceptible to selective recall and socially desirable responses. Data-source triangulation reduced, but did not eliminate, these limitations.

Fourth, the study was exploratory and qualitative. Frequencies such as question generation, revisions, and scaffolding episodes were used descriptively to illustrate patterns rather than to establish statistical effects. Consequently, the study cannot claim that the Curiosity Loop caused improvements in writing ability, critical thinking, curiosity, or engagement.

A further alternative explanation concerns normal development within an Essay Writing course. Students could reasonably be expected to improve thesis construction, evidence use, counterargument, and revision simply through continued instruction and practice. What the present qualitative evidence can more appropriately

show is how students described and enacted these processes during a curiosity-oriented instructional experience, rather than isolating the framework as the sole explanation for change.

Future studies could therefore employ comparative or mixed-method designs involving larger samples and multiple institutions. Pre- and post-measures of writing quality, epistemic curiosity, or engagement could complement qualitative evidence, while longitudinal research could examine whether inquiry-related behaviors transfer to subsequent writing courses. Further investigation is also needed to identify how proficiency level, topic familiarity, group composition, teacher scaffolding, and individual willingness to communicate shape students' experiences of productive grappling.

Significance of the Findings

Taken together, the findings indicate that the pedagogical value of the Curiosity Loop lies less in making Essay Writing simply more entertaining and more in changing the relationship students develop with uncertainty. Questions became resources for constructing arguments; difficulty became an occasion for investigation when appropriately supported; peer interaction exposed assumptions that required reconsideration; and revision increasingly represented a change in thinking rather than merely correction of language form.

The study therefore extends existing EFL inquiry research by foregrounding the process connecting curiosity with academic writing activity. Within this classroom, meaningful inquiry was characterized neither by unrestricted student discovery nor by continuous lecturer explanation. Instead, it emerged through a negotiated space in which learners were encouraged to wonder, given time and support to grapple with ideas, and guided toward discoveries that could themselves stimulate further questioning. Such a perspective positions curiosity not as an optional motivational addition to EFL instruction, but as a potentially productive pedagogical resource for developing more reflective, evidence-

conscious, and intellectually engaged academic writers.

CONCLUSION

This study explored the implementation of the Curiosity Loop in the Essay Writing course among third-semester students of the English Education Study Program at Universitas Muhammadiyah Enrekang. The study focused on how students experienced the processes of wondering, grappling, and discovering, how these processes shaped different dimensions of engagement, and what pedagogical opportunities and challenges emerged during classroom implementation.

The findings indicate that students gradually moved from predominantly answer-seeking behavior toward more inquiry-oriented participation. Wondering encouraged students to identify knowledge gaps, formulate questions, and recognize issues requiring further investigation. Grappling provided opportunities to examine evidence, compare perspectives, negotiate meanings, and develop tentative arguments, although this process was most productive when students received sufficient linguistic and pedagogical scaffolding. Discovering was particularly visible through changes in students' thinking, including the revision of thesis statements, supporting evidence, counterarguments, and interpretations. In several cases, discovery also generated further questions, suggesting that inquiry did not necessarily end when students reached an initial understanding.

The implementation of the Curiosity Loop also facilitated multiple dimensions of student engagement. Cognitive engagement was reflected in evaluating evidence, questioning assumptions, and revising arguments; behavioral engagement appeared through questioning, searching, drafting, and revising; emotional engagement was characterized by a combination of curiosity, uncertainty, frustration, satisfaction, and increasing confidence; while social engagement emerged through peer questioning, discussion, feedback, and negotiation. These findings suggest that meaningful engagement in EFL writing cannot be

reduced to visible classroom participation alone, but involves interconnected intellectual, emotional, behavioral, and social processes.

Pedagogically, the Curiosity Loop offered several opportunities for Essay Writing instruction. It created space for students to develop ideas before receiving complete explanations, encouraged evidence-based argumentation, supported substantive revision, and transformed peer interaction into a resource for thinking rather than merely correction. At the same time, implementation required careful attention to linguistic limitations, unequal participation, dependence on lecturer support among some students, and the additional classroom time required for sustained inquiry. These challenges indicate that curiosity-driven learning should not be understood as minimally guided discovery; rather, it requires deliberate scaffolding and responsive lecturer intervention.

Conceptually, the study contributes to university EFL pedagogy by bringing together curiosity, inquiry, productive struggle, engagement, and academic writing within a single classroom-based perspective. The Curiosity Loop is therefore best understood not as a fixed instructional formula, but as a practical framework for creating learning conditions in which students are encouraged to question, investigate, reconsider, and refine their understanding through English.

The study is limited by its small, context-specific sample of 18 students, its implementation within a single Essay Writing class, and its eight-meeting duration. The qualitative design also does not allow causal claims regarding improvements in writing proficiency, curiosity, or engagement. Future studies may therefore examine the Curiosity Loop across different EFL courses and institutions, involve larger and more diverse participant groups, and employ mixed-method or comparative designs to investigate its relationship with writing quality, critical thinking, epistemic curiosity, and long-term learner engagement. Overall, the findings suggest that the educational

value of the Curiosity Loop lies in helping students develop a more productive relationship with uncertainty. Instead of viewing questions, difficulty, and revision as obstacles to learning, students can be guided to use them as resources for constructing more thoughtful, evidence-based, and reflective academic writing.

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Conflict of Interest

The authors declare that they have no conflict of interest.

Author Contributions

Asbar: Conceptualization, data collection, data analysis, and manuscript drafting. **Ismail (Corresponding Author):** Methodology, supervision, data interpretation, manuscript review, and editing. Both authors read and approved the final manuscript.

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Generative AI tools were used to assist with language refinement and manuscript organization. All content was critically reviewed, verified, and revised by the authors, who take full responsibility for the accuracy, originality, and integrity of the manuscript.

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