The Transformative Impact of Inquiry-Based Learning on EFL Students' Grammatical Mastery and Learning Engagement: An Experimental Study on Degrees of Comparison

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Abstract: This research investigates the efficacy and reception of the Inquiry Learning Strategy (ILS) in an Indonesian English as a Foreign Language (EFL) context, focusing on a specific grammatical structure: the degrees of comparison. It aims to measure the strategy's impact on academic achievement and to comprehensively understand student perceptions regarding its influence on engagement, collaboration, and the overall learning environment. Employing a quantitative pre-experimental design, this study utilized a one-group pretest-posttest model. The participants consisted of 27 eighth-grade students from SMPN 9 Banda Aceh, selected through purposive sampling. Data collection spanned four meetings, integrating a diagnostic pretest, a structured ILS intervention conducted over two sessions, an evaluative posttest, and a detailed Likert-scale questionnaire. Statistical analysis was performed using descriptive statistics and a paired-samples t-test, while questionnaire data were analyzed using percentage-based thematic analysis. The findings demonstrate a statistically significant improvement in grammatical mastery. The mean score increased from 50.37 (SD = 14.54) in the pretest to 77.78 (SD = 12.89) in the posttest, with a t-test confirming significance ($t(26) = -13.558$, $p < .001$). Furthermore, questionnaire results revealed overwhelmingly positive student perceptions. Over 96% of respondents agreed ILS facilitated understanding and collaboration, while 63% strongly affirmed it increased their activeness and enthusiasm. The strategy was endorsed as enjoyable, motivating, and highly suitable for EFL learning.
Keywords: Inquiry-Based Learning, Inquiry Learning Strategy, EFL (English as a Foreign Language), Grammar Instruction, Degrees of Comparison

INTRODUCTION

The global landscape of language education has progressively shifted from teacher-dominated, grammar-translation methodologies towards communicative and student-centered approaches. This paradigmatic evolution is driven by the understanding that language acquisition is most effective when learners are actively engaged in constructing meaning through authentic use and critical thinking (Richards & Rodgers, 2014). In Indonesia, a nation with a vast and diverse EFL learner population, the challenge of transitioning from entrenched traditional practices to more dynamic pedagogies is particularly pronounced. English instruction in many public junior high schools often remains characterized by a focus on rote memorization of grammatical rules and vocabulary, with limited opportunities for students to apply language in meaningful, exploratory contexts (Zein et al., 2020). This disconnect can lead to passive learning, low

motivation, and a fragile grasp of language that fails to translate into communicative competence.

Inquiry-Based Learning (IBL) emerges as a potent pedagogical response to these challenges. Rooted in constructivist and social-constructivist theories pioneered by Dewey (1938), Piaget (1970), and Vygotsky (1978), IBL repositions the learner from a passive recipient to an active investigator. It is defined as an educational strategy where learning is driven by questioning, problem-solving, and investigation, with the teacher acting as a facilitator rather than a sole knowledge authority (Pedaste et al., 2015). In the context of EFL, IBL aligns seamlessly with communicative language teaching principles, as it necessitates the authentic use of language for a genuine purpose: to inquire, discuss, analyze, and present findings (Cummins, 2017). This process naturally integrates speaking, listening, reading, and writing within a coherent, student-driven project.

The efficacy of IBL has been documented across various educational disciplines and, increasingly, within language learning. Previous research indicates its positive effects on student motivation, critical thinking skills, and deep conceptual understanding (Hmelo-Silver et al., 2007). Specific to EFL, studies have shown promising results in enhancing writing ability (Hamid et al., 2021), speaking fluency and interest (Rahayu, 2023; Wahono & Zahro, 2021), and reading comprehension (Lin, 2017). These studies collectively argue that IBL moves students beyond surface-level learning, fostering a more profound and lasting engagement with the language.

However, a discernible gap exists in the literature concerning the application of IBL to the explicit teaching of English grammar, often perceived as a less amenable, rule-based domain. Grammar instruction remains a crucial, yet frequently unengaging, component of EFL curricula. The "degrees of comparison" (positive, comparative, superlative) is a foundational grammatical topic in Indonesian junior high schools, essential for descriptive communication but often taught through repetitive drills and memorization. This study posits that IBL can transform this learning experience. By framing grammatical rules as problems to be investigated—for instance, discovering patterns in adjective transformation or applying rules to compare real-world objects—students can engage in a more meaningful and memorable learning process.

Therefore, this research is driven by two primary objectives derived from this identified gap. First, it seeks to quantitatively measure the impact of a structured ILS intervention on the grammatical mastery of eighth-grade Indonesian EFL students, specifically on the topic of degrees of comparison. Second, it aims to qualitatively capture and analyze the students' perceptions of this learning strategy, exploring its influence on their engagement, confidence, collaborative skills, and overall enjoyment of the language learning process. The study is guided by the following research questions:
1. To what extent does the implementation of the Inquiry Learning Strategy improve the grammatical mastery of eighth-grade EFL students regarding the degrees of comparison?
2. What are the students' perceptions of the Inquiry Learning Strategy in terms of its effect on their learning engagement, collaborative skills, and overall language learning experience?
This investigation is significant for several stakeholders. For EFL teachers in contexts similar to Indonesia, it offers a concrete, research-backed alternative pedagogical model for grammar instruction. For curriculum developers, it underscores the value of integrating inquiry-based frameworks into language syllabi. For the learners themselves, this study advocates for a classroom environment that values their curiosity and active participation, potentially leading to more positive attitudes toward English learning.

2. Literature Review
2.1 Conceptual Foundations of Inquiry-Based Learning (IBL)

Inquiry-Based Learning is not merely a teaching technique but a comprehensive pedagogical philosophy. Its core principle is that learning is most effective when it originates from students' questions, curiosities, and investigations. Dewey (1938) championed the idea of "learning by doing," arguing that education should be a process of living and not merely a preparation for future living. This philosophy directly informs IBL, where students are immersed in experiential learning cycles.

Constructivist theory, particularly the cognitive constructivism of Piaget (1970), posits that learners actively construct knowledge through interactions with their environment, assimilating new information into existing cognitive schemas or accommodating those schemas when faced with dissonance. IBL operationalizes this by presenting students with scenarios or problems that challenge their current understanding, prompting them to seek new information and restructure their knowledge. Social constructivism, as advanced by Vygotsky (1978), adds a crucial dimension by emphasizing the role of social interaction and collaboration in learning. The Zone of Proximal Development (ZPD)—the gap between what a learner can do independently and what they can achieve with guidance—is central. In IBL, teachers and peers provide the necessary "scaffolding" within this ZPD, facilitating learning through guided inquiry and collaborative discourse (Hmelo-Silver et al., 2007).

In an EFL context, IBL transforms the classroom into a community of practice (Lave & Wenger, 1991) where language is the tool for inquiry. Students use English to formulate questions, research information, debate hypotheses, and present conclusions. This authentic, purposeful use aligns perfectly with the core tenets of Communicative Language Teaching (CLT), which prioritizes meaningful communication over grammatical perfection in isolated sentences (Richards, 2006).

2.2 Models and Phases of Inquiry Learning

Various models delineate the structured phases of IBL. While terminology may differ, a common progression exists from stimulus to synthesis. A widely cited model is the 5E Instructional Model (Bybee et al., 2006): "Engage" (stimulating interest), "Explore" (hands-on investigation), "Explain" (articulating understanding), "Elaborate" (applying knowledge to new situations), and "Evaluate" (assessing understanding). In the context of this study, the implementation followed a synthesis of models proposed by Sagala (2006) and Leif et al. (2023), which include:

➢ Orientation/Formulating the Problem: The teacher presents a stimulating scenario or question related to degrees of comparison (e.g., "How would you convince someone that your hometown is the best place to live?").

➢ Hypothesis Generation: Students, often in groups, propose initial guesses or rules about how comparisons are formed.

➢ Investigation and Data Gathering: Students explore provided materials, texts, or examples to gather evidence. This is the active exploration phase.

➢ Analysis and Hypothesis Testing: Students analyze their collected data, comparing it against their initial hypotheses to see if their proposed rules hold.

➢ Conclusion and Communication: Students formulate and present their finalized rules or conclusions about the grammatical structure, engaging in discussion and reflection.

This cyclical, investigative process moves grammar learning from a declarative knowledge task ("knowing that") to a more procedural and exploratory one ("figuring out how and why").

2.3 IBL in EFL: Empirical Evidence and Benefits

A growing body of research supports IBL's application in EFL. Lin (2017) found that IBL significantly improved Taiwanese EFL students' reading comprehension and their strategic approach to texts compared to traditional instruction. The active, problem-solving nature of IBL encouraged deeper text engagement. In the domain of productive skills, Rahayu (2023) and Wahono & Zahro (2021) documented increased student interest and proficiency in speaking. When students inquire about a topic, they have a genuine reason to speak, moving beyond scripted dialogues. Hamid et al. (2021) reported positive effects on secondary students' writing outcomes, attributing success to the structured investigation process that helped learners organize and articulate complex ideas.

The benefits of IBL, as synthesized from the literature, are multifaceted:

- Enhanced Cognitive Engagement and Critical Thinking: IBL requires analysis, synthesis, and evaluation, fostering higher-order thinking skills (HOTS) as defined by Bloom's taxonomy (Anderson & Krathwohl, 2001).

- Deeper Conceptual Understanding: Discovering rules through investigation leads to more robust and transferable knowledge than passive reception (Prince & Felder, 2006).

- Increased Motivation and Autonomy: Student agency in the learning process fosters intrinsic motivation and develops self-directed learning skills (Deci & Ryan, 2000).

- Improved Collaborative and Social Skills:** Group-based inquiry necessitates communication, negotiation, and teamwork, building essential interpersonal competencies (Johnson & Johnson, 2009).

- Authentic Language Use: The inquiry process creates a natural context for integrated skills practice, making language learning purposeful.

2.4 Language Learning Strategies and IBL

IBL can be understood as a macro-strategy that orchestrates several micro-level Language Learning Strategies (LLS) as classified by Oxford (2011). This study's implementation naturally embedded key strategies:

- Social Strategies: Collaboration with peers, asking questions for clarification, and participating in group discussions were inherent to the ILS group work.

- Cognitive Strategies: Students practiced analyzing contrastive examples, deducing rules, and summarizing findings—all cognitive strategies.

- Metacognitive Strategies: The structured inquiry phases encouraged students to plan their investigation, monitor their group's progress, and evaluate their understanding—key metacognitive behaviors (Wenden, 1998).

- Affective Strategies: The engaging and supportive environment likely helped lower anxiety and build confidence, as students took risks in a collaborative setting.

Thus, ILS serves as a powerful pedagogical framework that activates a suite of beneficial learning strategies simultaneously.

2.5 The Present Study's Position

While previous studies have validated IBL for integrated skills or specific competencies like writing and speaking, its targeted application to a discrete grammatical subsystem like the degrees of comparison in a mainstream Indonesian junior high school remains under-explored. This study aims to fill this niche. It operates on the hypothesis

that the analytical and discovery-oriented nature of IBL is ideally suited to grammar learning, potentially leading to better retention and application than traditional methods. Furthermore, by coupling test score analysis with detailed student perception data, this research seeks to provide a holistic evaluation of ILS's impact, addressing both the cognitive and affective domains of learning. This dual focus on product (test scores) and process (student experience) offers a more complete picture of the strategy's value in the EFL classroom.

METHODS

Research Design

This study employed a pre-experimental research design, specifically the one-group pretest-posttest model. This design was selected due to practical constraints in the school setting, where creating a controlled equivalent group was not feasible. The design is structured as follows: O1 (Pretest) → X (Treatment with ILS) → O2 (Posttest). While this design does not control for all external threats to validity (e.g., history, maturation), it provides a foundational indication of a treatment's effect and is appropriate for exploratory classroom-based research (Creswell, 2015). The inclusion of a detailed questionnaire also added a descriptive element to capture participant perceptions.

3.2 Setting and Participants

The research was conducted at SMPN 9 Banda Aceh, a public junior high school in Aceh Province, Sumatera, Indonesia. The school's English curriculum follows the national standard, which includes the degrees of comparison in the eighth-grade syllabus. The population comprised all 103 second-grade (eighth-grade) students across four classes.

A purposive sampling technique was used to select a single intact class of 27 students (aged 13-14) as the study's sample. This class was chosen in consultation with the school's English teacher based on the criterion that the students had not been previously exposed to a formal inquiry-based learning strategy, thereby allowing the researcher to observe its initial implementation and impact. The sample consisted of both male and female students with mixed proficiency levels, as reflected in the initial pretest scores.

3.3 Instruments and Data Collection

The data were collected over four meetings in a two-week period using four primary instruments:

a. Pretest and Posttest: Parallel 20-item multiple-choice tests were developed by the researcher, focusing exclusively on the grammatical accuracy of degrees of comparison in various contexts. Each correct answer was awarded 5 points, yielding a maximum score of 100. The pretest (Appendix F) established a baseline of students' prior knowledge. The posttest (Appendix F), administered after the intervention, measured learning gains. Test items were validated for content relevance by the researcher's academic supervisors.

b. Inquiry Learning Strategy (ILS) Treatment: The treatment was the pedagogical intervention conducted over two 80-minute sessions (meetings 2 and 3). The researcher acted as the teacher, following a detailed Lesson Plan (RPP - Appendix F) structured around the ILS phases:

> ➢ Meeting 2 (Positive & Comparative Degree): Orientation through a comparative question about classmates. Hypothesis generation on rule formation. Guided investigation with example sentences. Group analysis and rule formulation. Presentation of conclusions and application exercises.

> ➢ Meeting 3 (Superlative Degree & Integration): Building on prior knowledge, focusing on superlatives. A more complex investigative task involving comparing real or pictured items (e.g., products with different prices and features). Hypothesis testing, group discussion, and a culminating presentation where groups used all three degrees of comparison to argue a point (e.g., "Which product is the best value?").

In addition, worksheets, group tasks, and guided questioning were used as scaffolding tools.

c. Questionnaire: A closed-ended questionnaire (Appendix F), adapted from Arbi (2023), was administered after the posttest. It contained 10 statements measured on a 4-point Likert scale (4=Strongly Agree, 3=Agree, 2=Disagree, 1=Strongly Disagree). The statements probed perceptions across five themes: (1) "Understanding" (ease, speed), (2) "Engagement" (activeness, enthusiasm, fun), (3) "Collaboration" (group work effectiveness), (4) "Affective Outcomes" (confidence in speaking/expressing opinions), and (5) "Overall Evaluation" (suitability, positive influence).

Data Analysis Techniques

The quantitative data from the tests were analyzed using descriptive statistics (mean, standard deviation) and inferential statistics. A paired-samples t-test was conducted using SPSS (or similar software) to determine if the difference between pretest and posttest mean scores was statistically significant ($p < .05$). This test was chosen as it compares the means of two related groups (the same students at two time points). On the otherhand, the questionnaire data were analyzed using percentage-based descriptive analysis. The frequency (f) and percentage (%) of responses for each Likert point (Strongly Agree to Strongly Disagree) were calculated for all 10 items using the formula: $P = (f / N) \times 100\%$, where P is percentage, f is frequency, and N is the total number of respondents (27). The results were then interpreted thematically in alignment with the five perception themes to provide a coherent narrative of student feedback.

RESULTS

Quantitative Findings: Grammatical Mastery

The primary quantitative data pertained to the students' test scores. As shown in Table 1, the pretest results indicated a low level of initial mastery, with a mean score of 50.37 (SD = 14.54). Individual scores ranged widely from 10 to 65, highlighting varied starting points.

Table 1: Descriptive Statistics for Pretest and Posttest Scores (N=27)

Test	Mean Score	Standard Deviation	Minimum Score	Maximum Score
Pretest	50.37	14.54	10	65
Posttest	77.78	12.89	55	100

Following the ILS intervention, the posttest mean score rose substantially to 77.78 (SD = 12.89). The score range also shifted upward (55-100), with three students achieving a perfect score. This represented a mean increase of 27.41 points. To determine the statistical significance of this improvement, a paired-samples t-test was conducted. The results, presented in Table 2, showed a highly significant difference between the pretest

and posttest scores ($t(26) = -13.558$, $p < .001$). The 95% confidence interval for the mean difference (-31.56 to -23.25) did not include zero, further confirming the significance. Therefore, the null hypothesis (H0) that ILS has no effect on improving mastery was rejected, and the alternative hypothesis (Ha) was accepted.

Table 2: Paired Samples T-Test Results

Pair	Mean Diff.	t-value	df	p-value (2-tailed)	95% CI of the Difference
Pretest-Posttest	-27.41	-13.558	26	< .001	[-31.56, -23.25]

Qualitative Findings: Student Perceptions

The analysis of the 10-item questionnaire provided rich insight into how students experienced the ILS. The aggregated responses are summarized thematically below, with key percentage highlights.

Theme 1: Facilitation of Understanding

Statement 1: "Learning through ILS made me easier to understand..." A combined 96% (44% SA, 52% A) agreed, with only one student disagreeing (4%). This strongly suggests that the investigative approach demystified the grammatical rules.

Statement 4: "...made me able to understand quickly." Here, 48% strongly agreed and 44% agreed (total 92%). This indicates that the discovery process, though potentially time-consuming, led to efficient cognitive encoding for most students.

Theme 2: Enhancement of Engagement and Enjoyment

Statement 2: "...made me more active." A strong 63% strongly agreed, with 37% agreeing (total 100%). This was one of the most unequivocal results.

Statement 6: "...made learning fun." 56% strongly agreed, 37% agreed (total 93%).

Statement 7: "...made me enthusiastic." Mirroring Statement 2, 63% strongly agreed, 37% agreed (total 100%).

These results paint a clear picture of a transformed classroom dynamic. The ILS successfully shifted student behavior from passive to active and positively affected their emotional response to the lesson.

Theme 3: Development of Collaborative Skills

Statement 3: "...helped improve our ability to collaborate and work in groups." This statement received 100% agreement (59% SA, 41% A). This unanimous feedback underscores ILS's power in fostering essential teamwork and communication skills.

Theme 4: Affective and Confidence-Building Outcomes

Statement 5: "...gave me courage to appear in front of the class." 85% agreed (37% SA, 48% A).

Statement 8: "...motivated me to be braver in expressing my opinions." 93% agreed (37% SA, 56% A).

While slightly less emphatic than the engagement themes, these results indicate that the supportive, group-based inquiry environment reduced anxiety and built students' confidence in using English for public presentation and debate.

Theme 5: Overall Evaluation and Suitability

Statement 9: "...has had a positive influence on me." 96% agreed (48% SA, 48% A), with one student strongly disagreeing (4%).

Statement 10: "...is a very suitable strategy to use in learning English." 100% agreed (48% SA, 52% A).

The overwhelming consensus on suitability and positive influence provides powerful endorsement for the strategy from the learners' perspective.

The findings of this study offer compelling evidence that the Inquiry Learning Strategy is both an effective and affectively positive approach to teaching grammar in an Indonesian EFL context. The discussion interprets these findings in relation to the research questions, existing literature, and broader educational implications.

Addressing Research Question 1: Efficacy in Grammatical Mastery

The significant improvement in posttest scores (p < .001) provides a clear affirmative answer to the first research question. The 27.41-point mean gain is educationally substantial, moving the class average from a failing grade to a solid "B" range. This aligns with and extends the findings of previous studies on IBL in EFL. While Hamid et al. (2021) and Lin (2017) found benefits for writing and reading, this study demonstrates that the analytical, pattern-finding nature of inquiry is equally potent for grammatical structure acquisition.

The success can be attributed to several interlinked factors rooted in IBL theory. First, the "cognitive engagement" required by the inquiry cycle—formulating hypotheses, analyzing data, testing ideas—ensured deep processing of the grammatical input (Craik & Lockhart, 1972). Instead of memorizing a rule like "add '-er' for short adjectives," students engaged in a cognitive struggle to "discover" that rule from examples, leading to stronger memory traces. Second, the "social-constructivist" element was crucial. Group discussions (Vygotsky, 1978) allowed students to articulate their nascent understandings, hear alternative viewpoints, and collaboratively negotiate meaning. A student struggling alone might give up, but within a group, peer scaffolding provided the necessary support to reach understanding. Finally, the "application phase" (creating sentences, arguing about products) moved knowledge from declarative to procedural. By using the degrees of comparison for a genuine communicative purpose, students practiced and internalized the rules more effectively than through disconnected exercises.

Addressing Research Question 2: Student Perceptions and Affective Impact

The questionnaire data provided a resoundingly positive answer to the second research question. Students perceived ILS as making learning easier, more active, enjoyable, collaborative, and confidence-building. These perceptions are arguably as important as the test score gains, as they relate directly to motivation and long-term language learning attitudes (Dörnyei, 2005).

The 100% agreement on increased activeness and collaboration directly validates the core mechanics of IBL. The classroom ceased to be a site of teacher transmission and became a workshop of student investigation. The unanimous agreement on improved collaboration (Statement 3) highlights a critical 21st-century skill that traditional grammar drills rarely develop. The high levels of reported enjoyment and enthusiasm (Statements 6 & 7) are particularly noteworthy. They suggest that ILS can overcome the common student perception of grammar as dry and difficult, transforming it into an engaging intellectual puzzle. This aligns with Deci and Ryan's (2000) Self-Determination Theory; ILS likely satisfied students' needs for "autonomy" (directing their inquiry), "competence" (solving the grammatical puzzle), and "relatedness" (working with peers), thereby fostering intrinsic motivation.

The positive results on confidence (Statements 5 & 8) can be explained by the reduced anxiety inherent in a group-based, process-oriented approach. Errors became part of the investigative process rather than a source of shame. Presenting a group's findings also shared the performance burden, making public speaking less daunting.

Synthesis and Implications

The synergy between the quantitative and qualitative findings is the most powerful outcome of this study. The improved test scores are not an isolated result; they are underpinned by a profound shift in the classroom experience. Students learned more *because* they were more engaged, collaborative, and motivated. This reinforces the holistic argument for constructivist pedagogies: cognitive and affective domains are inseparable in effective learning.

The single dissenting opinion in Statement 9 (positive influence) is a valuable reminder that no strategy is universally perfect. This student may have preferred individual learning, felt overshadowed in a group, or needed more structured guidance. This underscores the importance of the teacher's role as a sensitive facilitator in IBL, ensuring all learners are supported.

Limitations and Delimitations

This study has several limitations. The pre-experimental design is the most significant, as it cannot definitively rule out other factors (e.g., increased attention, practice effect from the pretest) as causes for the improvement. The absence of a control group taught via a traditional method limits comparative strength. The sample size was small and from one school, affecting generalizability. The short duration of the intervention does not indicate long-term retention. Furthermore, the study delimited its focus to one grammatical topic and relied on a researcher-made test and questionnaire, which, while validated informally, may have inherent biases

CONCLUSION

This study concludes that the Inquiry Learning Strategy is a highly effective and positively received pedagogical approach for teaching the degrees of comparison to eighth-grade EFL students in Indonesia. It successfully bridges the gap between the often-abstract nature of grammar and the need for active, meaningful learning. The strategy led to statistically significant gains in grammatical mastery and, perhaps more importantly, fostered a classroom environment characterized by high engagement, productive collaboration, increased confidence, and genuine enjoyment.

The implications are clear for EFL practitioners. ILS offers a viable, research-informed alternative to transform grammar lessons from monotonous drills into dynamic explorations. For optimal implementation, teachers require training in designing open-ended yet guided inquiry tasks and in facilitating productive group work. Future research should address this study's limitations by employing quasi-experimental designs with control groups, extending the intervention period, investigating ILS for other language areas like vocabulary or pronunciation, and exploring its impact across different cultural and proficiency contexts. By continuing to investigate and refine inquiry-based approaches, the EFL community can better equip learners not only with linguistic knowledge but also with the cognitive, social, and affective tools for lifelong language learning

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