VNU Journal of Foreign Studies

Journal homepage: https://jfs.ulis.vnu.edu.vn/

INVESTIGATING THE IMPACT OF A BLOOM'S TAXONOMY-BASED STRATEGY ON EFL STUDENTS' SELF-GENERATED READING QUESTIONS AND THEIR PERCEPTIONS: A VIETNAMESE CLASSROOM STUDY

Nguyen Ha Trang*

VNU University of Languages and International Studies, No.2 Pham Van Dong, Cau Giay, Hanoi, Vietnam

Received 29 August 2025
Revised 04 November 2025; Accepted 22 December 2025

Abstract: This study investigates the impact of explicit instruction in Bloom's Taxonomy on the cognitive levels of self-generated reading questions by Vietnamese EFL university students, as well as their perceptions of this strategy. Adopting an exploratory case study design, the researcher worked with 15 university students from non-English majors, who took part in three online sessions of a reading course. The participants were asked to formulate their own comprehension questions before and after being introduced to Bloom's hierarchical framework. Content analysis of the questions revealed a modest shift toward higher-order thinking, with the emergence of Create-level questions (5.6%) and increases in Apply and Evaluate categories. Meanwhile, thematic analysis of the students' written reflections revealed a gradual shift in their perceptions, moving from initial uncertainty and difficulty to increased confidence, strategic awareness, and recognition of cognitive benefits. Despite remaining challenges in formulating higher-level questions, most of the students expressed a willingness to apply the strategy in future academic reading. The findings highlight the pedagogical potential of Bloom's Taxonomy not only as a tool for teachers but also as a metacognitive scaffold to support learner autonomy and critical engagement with texts in EFL contexts.

Keywords: EFL students, self-generated questions, Bloom's Taxonomy, learner perceptions, reading comprehension

* Corresponding author.
Email address: hatrangnguyen8529@gmail.com
https://doi.org/10.63023/2525-2445/jfs.ulis.5604

KHẢO SÁT TÁC ĐỘNG CỦA MỘT CHIẾN LƯỢC DỰA TRÊN THANG TƯ DUY BLOOM ĐỐI VỚI CÁC CÂU HỎI ĐỌC HIỂU TỰ XÂY DỰNG VÀ NHẬN THỨC CỦA SINH VIÊN HỌC TIẾNG ANH: MỘT NGHIÊN CỨU LỚP HỌC TẠI VIỆT NAM

Nguyễn Hà Trang

Trường Đại học Ngoại ngữ, Đại học Quốc gia Hà Nội, Số 2 Phạm Văn Đồng, Cầu Giấy, Hà Nội, Việt Nam

Nhận bài ngày 29 tháng 8 năm 2025
Chỉnh sửa ngày 04 tháng 11 năm 2025; Chấp nhận đăng ngày 22 tháng 12 năm 2025

Tóm tắt: Nghiên cứu này khảo sát tác động của việc giảng dạy về Thang đo Bloom (Bloom's Taxonomy) đối với cấp độ tư duy trong các câu hỏi đọc mà sinh viên Việt Nam tự tạo khi học tiếng Anh như ngoại ngữ, cũng như nhận thức của họ về chiến lược này. Áp dụng thiết kế nghiên cứu tình huống khám phá, nghiên cứu được tiến hành trên 15 sinh viên không chuyên ngành tiếng Anh, thông qua ba buổi học trực tuyến trong khóa học đọc. Sinh viên được yêu cầu tự tạo các câu hỏi đọc hiểu trước và sau khi được giới thiệu về Thang đo Bloom. Phân tích nội dung các câu hỏi cho thấy một sự chuyển biến nhẹ hướng tới tư duy bậc cao, với sự xuất hiện của các câu hỏi ở cấp "Sáng tạo" (5,6%) và sự gia tăng câu hỏi ở cấp "Vận dụng" và "Đánh giá". Đồng thời, phân tích chủ đề các phản hồi của sinh viên cho thấy một sự thay đổi dần dần trong nhận thức của họ, từ sự bỡ ngỡ và khó khăn ban đầu sang sự tự tin cao hơn, nhận thức được chiến lược và lợi ích về tư duy mà phương pháp mang lại. Mặc dù vẫn còn những thách thức trong việc hình thành các câu hỏi bậc cao, hầu hết sinh viên đều bày tỏ sẵn sàng áp dụng chiến lược này trong các bài đọc học thuật tương lai. Những phát hiện này nhấn mạnh tiềm năng sư phạm của Thang đo Bloom, không chỉ như một công cụ cho giáo viên mà còn như một công cụ giúp người học tự nhận thức và phát triển khả năng tư duy phản biện với văn bản trong quá trình học tiếng Anh.

Từ khóa: sinh viên học tiếng Anh, câu hỏi tự xây dựng, thang tư duy Bloom, nhận thức của người học, đọc hiểu

1. Introduction

Reading comprehension plays a crucial role in developing thinking skills and academic literacy for learners of English as a foreign language (EFL). However, many Vietnamese university students engage with reading texts in a passive way, often relying on pre-set questions rather than critically analyzing content. This approach contrasts with current educational goals that emphasize higher-order thinking skills (HOTS) such as analyzing, evaluating, and creating (Anderson & Krathwohl, 2001), as well as promoting learner autonomy through self-directed strategies (Benson, 2011). Academic pressures from tests like IELTS/TOEIC and complex professional texts further demand reasoning, critical thinking, and synthesis (Nguyen, 2023; Phan et al., 2019; Grabe & Stoller, 2011).

In response to these challenges, one effective approach to foster both learner autonomy and cognitive development is encouraging students to generate their own questions while reading. With the support of this strategy, they can not only improve reading comprehension but also engage with texts at increasingly deeper cognitive levels, from remembering and understanding to analyzing, evaluating, and even creating new ideas, closely aligning with the Revised Bloom's Taxonomy (Anderson & Krathwohl, 2001).

Despite growing interest in reading strategies and critical thinking in Vietnamese EFL education, limited research has examined how students generate their own questions while reading or how they perceive this process. To address this gap, this study investigates Vietnamese EFL undergraduates, examining (1) how Bloom's Taxonomy instruction affects the cognitive level of their questions and (2) changes in their perceptions pre- and post-intervention. As an exploratory case study, the research focuses on gaining in-depth insights into students' cognitive engagement with texts rather than produce generalizable findings. To achieve these aims, the study is guided by the following research questions:

Research question 1: *To what extent does explicit instruction on Bloom's Taxonomy influence the cognitive levels of students' self-generated reading questions?*

Research question 2: *How do students perceive the use of self-generated questioning as a reading strategy before and after the instructional intervention?*

2. Literature Review

2.1. Academic Reading Comprehension in EFL Contexts

Academic reading comprehension involves constructing meaning from complex texts through higher-level cognitive processes beyond decoding. Academic readers must integrate information with prior knowledge, form opinions, and critically evaluate arguments (Grabe & Stoller, 2011). However, many EFL learners struggle due to limited proficiency and insufficient strategy training (Eriksson, 2022). In Vietnam, students have reported particular difficulty with IELTS reading tasks that are disconnected from the curriculum, underscoring the need for more meaningful, strategy-based instruction (Nguyen, 2023).

2.2. Reading Comprehension Strategies and Higher-order Thinking Skills (HOTS)

Effective academic reading comprehension relies on the integration of multiple strategies that combine cognitive processes, active engagement with texts, and metacognitive regulation. According to Suhaila et al. (2025), essential strategies include skimming and scanning, predicting content, generating questions before and during reading, summarizing key ideas, making contextual inferences, visualizing textual information, and consciously monitoring comprehension. Empirical evidence has strongly supported the positive impact of such strategies on reading outcomes (Banditvilai, 2020). For example, studies with English-major students have demonstrated that those trained in strategic reading, particularly in techniques such as skimming, scanning, predicting, and questioning, showed significant improvement in overall comprehension.

Reading strategies are generally categorized into global, problem-solving, and support strategies (Mokhtari & Sheorey, 2002). While effectively describing how learners interact with texts, these categories have rarely been examined in terms of the cognitive demands they entail. This highlights a crucial shift in focus, from merely applying strategies to understanding the thinking processes that underpin them. In this regard, other research has shown that HOTS such as analyzing and evaluating, core elements of Bloom's Taxonomy, are essential to academic reading (Anderson & Krathwohl, 2001).

Research in EFL contexts, including Indonesia and Vietnam (e.g., Maab et al., 2024; Nguyen et al., 2020), has also confirmed the link between reading strategies and critical thinking. However, much of this research has examined teacher-led questioning or predefined comprehension tasks, with limited attention to how students themselves apply these cognitive skills through self-generated questioning. Addressing this gap is essential, as student-generated

questions activate cognitive and metacognitive processes that deepen comprehension and foster autonomy, while their effectiveness is shaped by contextual factors such as teacher scaffolding, classroom environment, and learner motivation (Fadila et al., 2024).

2.3. Student-Generated Questions

Student-generated questioning (SGQ) refers to learners' formulation of their own questions during reading by drawing on prior knowledge or responding to unfamiliar concepts or vocabulary. According to Chin and Brown (2002), student-generated questions can be classified into basic information questions, which reflect surface learning, and wonderment questions, which engage higher-order thinking through processes such as comprehension, prediction, anomaly detection, application, and planning. Research shows that SGQ enhances learning when questions move beyond factual recall; however, without explicit instruction, students' questions often remain at lower cognitive levels (Chin & Osborne, 2008; Işır & Uyar, 2022; Spencer et al., 2020). Structured support and feedback have been found to improve the quality of student-generated questions, fostering more open-ended and reflective inquiry (Causey & Spencer, 2024; Yu & Chen, 2024).

Among SGQ approaches, self-questioning is widely recognized for improving reading comprehension across educational levels (Joseph et al., 2016; Msaddek et al., 2020). Its effectiveness lies in promoting active engagement, metacognitive monitoring, and self-regulation (Bharuthram et al., 2018), with recent studies extending its benefits to grammar learning and contextualized instruction (Cheng et al., 2021; Lin et al., 2022).

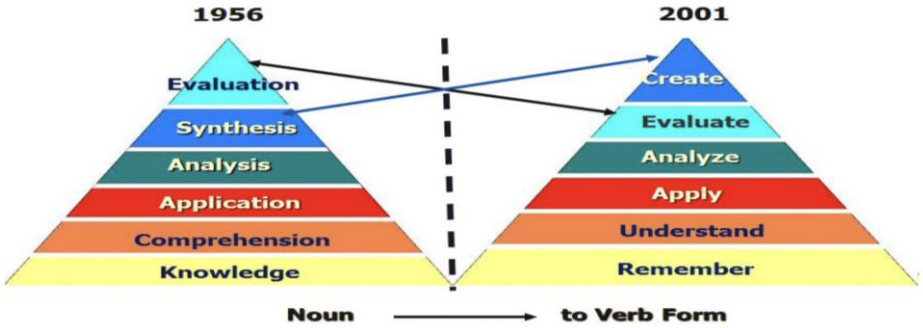
In Southeast Asia, studies in Indonesia and Vietnam similarly report gains in comprehension, engagement, and higher-order questioning through self-questioning practices (Nguyen et al., 2016; Phan, 2024; Sunggingwati et al., 2009; Thi et al. 2024). Nevertheless, while international research emphasizes explicit instruction and scaffolding to promote higher-order questions, Vietnamese studies have only begun to examine how such support shapes the cognitive quality of student-generated questions. This gap suggests the need for instructional interventions, such as explicit use of Bloom's Taxonomy, to further strengthen SGQ practices in Vietnamese EFL classrooms.

2.4. Revised Bloom's Taxonomy as a Framework for Analyzing Student Questions

Bloom's Taxonomy is a framework for classifying cognitive skills, originally introduced by Bloom et al. (1956) with six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation. The revised version by Anderson and Krathwohl (2001) rephrased these as: remember, understand, apply, analyze, evaluate, and create. This taxonomy aids in curriculum design, learning objectives, and assessment. This hierarchical structure, often illustrated as a pyramid model (see Figure 1), shows how learners progress from basic recall to complex creation. Such visualization not only clarifies the relationships among cognitive processes but also supports educators and learners in identifying where a particular question or task fits within this continuum.

Figure 1

Revised Bloom's Taxonomy (Wilson, 2001)



Beyond its instructional role, Revised Bloom's Taxonomy is widely used to analyze students' thinking, including SGQ in reading. Identifying question levels can enhance metacognitive awareness and self-directed learning (Momen et al., 2022), and instructors commonly classify questions according to Bloom's levels to assess higher-order thinking and its relationship with achievement (Wisinski & Yu, 2020). However, studies on inter-rater reliability indicate that such classification can be subjective, underscoring the need for clear rubrics and rater training (Monrad et al., 2021). In Vietnam, Bloom's Taxonomy is primarily applied to evaluate the cognitive complexity of student-generated questions and promote critical thinking. Although teachers often categorize questions by cognitive level (Nguyen & Nguyen, 2023), students' questions tend to remain at lower levels, particularly recall and comprehension (Phuong et al., 2018), reflecting limited emphasis on higher-order processes (Nguyen et al., 2008). Research has also shown its value in supporting teachers' question design at varied cognitive levels (Untailawan, 2023). Nevertheless, empirical studies examining the use of Bloom's Taxonomy to guide students' own question formulation and its impact on cognitive development remain scarce, especially in Vietnamese EFL university contexts where explicit cognitive strategy instruction is limited.

2.5. Summary and Gap Identification

The literature underscores the role of reading comprehension strategies in supporting EFL students' academic reading, with SGQ emerging as a particularly effective approach for fostering higher-order thinking and learner autonomy. However, existing research has largely concentrated on teacher-led questioning, with limited attention to students' own question generation, especially in EFL university contexts. Moreover, although the value of Revised Bloom's Taxonomy and student-generated questioning has been widely acknowledged, little research has examined how explicit instruction in Bloom's framework influences the cognitive quality of students' questions or how learners perceive this strategy. These gaps point to the need for classroom-based studies that investigate both the cognitive levels of student-generated questions and students' perceptions following explicit Bloom's Taxonomy instruction, informing more effective academic reading pedagogy in EFL settings.

3. Method of the Study

3.1. Research Design

This study adopted an exploratory qualitative case study design, incorporating a pre-post classroom intervention to investigate how undergraduate EFL students formulate reading

comprehension questions when using and not using the Revised Bloom's Taxonomy. The design allowed for within-group comparison of question quality before and after instruction, as well as exploration of students' perceptions. While the primary focus was qualitative, basic quantitative data were used to illustrate changes in the levels of student-generated questions. Content analysis was used to classify the cognitive levels of student-generated questions, while thematic analysis was applied to students' open-ended reflections.

3.2. Participants

The participants included 15 non-English major undergraduate EFL students aged 19 to 22 from different Vietnamese universities. All students have gained at least a B1 level English proficiency according to the Common European Framework of Reference for Languages (CEFR), as assessed by placement tests, standardized exams, or course levels. Specifically, 7 students were at B1, 5 at B2, and 3 at C1 level.

Participants came from a variety of academic backgrounds, grouped as follows:

- **English-related majors**: English Language (5), English Pedagogy (1)
- **Economics, Finance, and Business**: Statistics and Economics (1), Finance and Economics (1), International Business (1), Banking and Finance (1), Auditing (1)
- **Hospitality, Logistics, and Management**: Hotel Management (1), Logistics and Supply Chain Management (1), Management Information Systems (1)
- **Law and International Relations**: International Law (1), Law (1), International Politics and Diplomacy (1), International Relations (1)

Participants were selected using convenience sampling, based on their availability and willingness to participate in the online reading sessions. While the sample size was small and not intended to be statistically representative, efforts were made to include students from diverse academic disciplines and institutions to enhance contextual variety and reflect a broader range of English learning experiences in Vietnamese higher education.

In addition, ethical procedures were strictly followed. All participants gave informed consent, were assured of confidentiality and anonymity, and were assigned unique codes in all data, and any identifying information was removed from reports and appendices. Participants were also informed of their right to withdraw at any time without penalty.

3.3. Instruments

A range of instruments was employed to facilitate data collection and analysis in alignment with the study's objectives.

Reading materials: Two unmodified expository reading passages, each ranging from 500 to 600 words, were selected from *Complete IELTS Bands 5–6.5* (Brook-Hart & Jakeman, 2012). This textbook is widely used in Vietnamese tertiary EFL classrooms and is specifically designed for intermediate learners at the B1-B2 level of the Common European Framework of Reference for Languages (CEFR). The texts were chosen for thematic relevance, linguistic suitability, and their potential to elicit questions across Bloom's cognitive levels, and were cross-checked with a local EFL instructor for appropriateness.

Digital question-generation worksheet: Students recorded their SGQ in a shared Google Document during each session, enabling real-time submission and streamlined data collection.

Open-ended reflection survey: A pre- and post-intervention survey was used to examine students' perceptions of the strategy and changes in their approach to academic reading.

Revised Bloom's Taxonomy coding rubric: The coding rubric was developed and adapted by the researcher based on the Revised Bloom's and further informed by a Vietnamese study that implemented this framework in an intermediate EFL reading context (Duc, 2008). The rubric was then refined to reflect the cognitive demands of IELTS reading tasks. Each level was defined using linguistic and cognitive indicators, with sample question stems. The finalized rubric is presented in Appendix A (Table A1) to ensure transparency and replicability.

3.4. Data Collection Procedures

Data were collected across three consecutive 60-minute online reading sessions conducted via Zoom. In Session 1 (pre-intervention), students completed a reading task and generated comprehension questions without prior instruction, followed by a baseline open-ended survey. Session 2 served as the instructional phase, during which the Revised Bloom's Taxonomy was introduced through guided explanation and practice; no data were collected. In Session 3 (post-intervention), students applied the Bloom-based framework to generate questions for a new text, and completed a post-intervention survey to reflect on their experience.

3.5. Data Analysis

All questions produced by participants in the pre- and post-intervention phases were compiled, anonymized, and entered into an Excel spreadsheet, including student ID, question text, assigned cognitive level, and rationale for coding. Using the adapted coding rubric based on the Revised Bloom's Taxonomy, each question was categorized into one cognitive level.

The coding was conducted manually by the researcher through multiple review cycles to ensure consistent application of the rubric. Although coding was performed by a single rater and inter-rater reliability was not calculated, reliability was enhanced through repeated reviews, reference to rubric descriptors, and documented justifications for each decision, particularly where questions could span multiple cognitive levels. An example coding entry is provided in Appendix A (Table A2). Frequencies were then calculated to compare the distribution of cognitive levels across phases.

To complement the analysis of student-generated questions, qualitative data from the open-ended surveys were thematically analyzed using the six-phase framework proposed by Braun and Clarke (2006). This involved familiarizing with the data, generating initial codes, identifying potential themes, reviewing and refining these themes, defining and naming them, and finally producing a thematic report. An inductive approach guided the coding process, enabling the identification of recurring patterns in students' responses. Representative student comments were also included to illustrate key themes and provide deeper insight into learners' reflections on the experience.

4. Results

4.1. Changes in the Cognitive Levels of Student-Generated Questions

This section addresses the first research question. Overall, explicit instruction on the Revised Bloom's Taxonomy led to a moderate but meaningful improvement in the cognitive depth of SGQ, reflecting more deliberate and higher-level engagement with reading texts.

Before the instruction, most students tended to ask surface-level questions focusing on factual recall or word meaning (e.g., "What does the author mean by…?" or "What is the main idea of paragraph 2?"). Such questions primarily reflected the Remember and Understand levels

of Bloom's Taxonomy, indicating a limited engagement with the text beyond basic comprehension.

After the instruction, students' questions reflected a more deliberate attempt to explore relationships, causes, and implications within the text, an indicator of movement toward higher-order thinking. For instance, several students started asking Analyze or Evaluate questions such as "Why does the author mention the 'moment of truth' here?" or "Do you think it's effective for supermarkets to place fresh produce at the beginning?" Some even attempted Create-level questions that extended the text to new contexts (e.g., "Can you think of another way supermarkets could entice customers to purchase more items?").

To illustrate these trends, Table 1 summarizes the overall distribution of question levels, showing that while Remember-type questions decreased modestly (from around one-third to one-fourth of all questions), Apply, Evaluate, and Create levels appeared or expanded after the intervention (8.3%, 0.4% and 5.6%, respectively). These shifts, though moderate, indicate qualitative growth in students' awareness of cognitive complexity rather than a purely quantitative improvement.

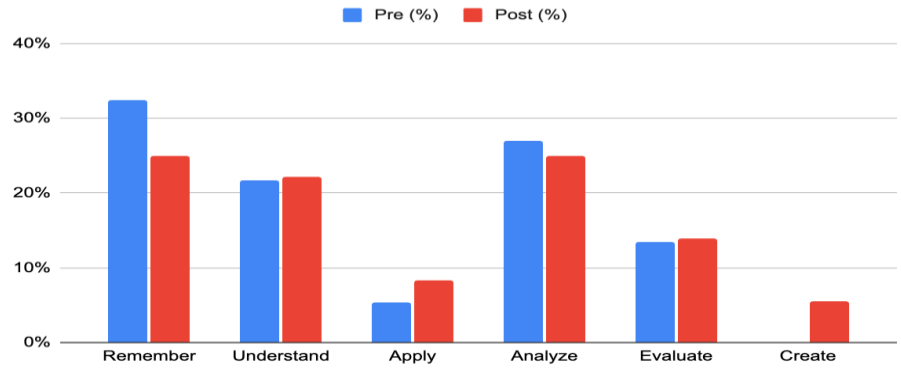
Table 1

Distribution of Student-Generated Questions Across Bloom's Levels

Bloom Level	Cognitive Order	Pre Count	Post Count	Pre %	Post %	Change
Remember	Lower-order	12	9	32.4%	25.0%	-7.4%
Understand	Lower-order	8	8	21.6%	22.2%	0.6%
Apply	Lower-order	2	3	5.4%	8.3%	2.9%
Analyze	Higher-order	10	9	27.0%	25.0%	-2.0%
Evaluate	Higher-order	5	5	13.5%	13.9%	0.4%
Create	Higher-order	0	2	0.0%	5.6%	5.6%

Figure 2

Distribution of Questions by Bloom's Levels (Pre-Post)



The cognitive improvement was also reflected in students' self-reports. Before the intervention, most students reported uncertainty about what types of questions to ask and tended to rely on simple recall or vocabulary-based questions (Students 2, 5, 6, 9, 13). Some admitted that their questions mainly targeted word meanings or surface details because they were unfamiliar with how to frame more analytical or inferential ones. For instance, Student 2 shared that it was "can easily ask "what is the meaning of the word…", but generating questions to answer myself and dig deeper is challenging," while Student 6 commented that they "need guidance on how to focus questions to improve comprehension".

After the explicit instruction on Bloom's Taxonomy, students' reflections indicated clearer cognitive awareness and purposeful use of question levels. Many became more conscious of how different question types represent distinct levels of thinking, and several began to intentionally formulate higher-order questions that required reasoning and evaluation rather than recall. Student 1 noted that they could "think ahead about what kind of questions to ask," and Student 12 observed that their questions "the question level improved as I compared text info with my own knowledge." Similarly, Student 5 described feeling "challenged but in a positive way" to think critically about the text rather than focusing only on facts.

4.2. Students' Perceptions of Self-Generated Questioning Using Revised Bloom's Taxonomy

This section addresses the second research question. Thematic analysis of their written reflections revealed a shift in attitudes, ranging from initial confusion and unfamiliarity to increased confidence and recognition of cognitive benefits. These perceptions are presented under key themes that emerged from both pre- and post-instruction responses. Translated excerpts from students' reflections are included in the main text, and the full English translations of all responses are provided in Appendix C.

4.2.1. Initial Unfamiliarity and Early Awareness

Before instruction, most participants described the questioning strategy as "new", "strange", or "unfamiliar". They were unsure how to ask meaningful questions or how to identify focus points in a text:

"This method is completely different from what I have been taught." (Student 1)

"It's quite new to me; I'm still not used to this method." (Student 5)

Several learners attributed their uncertainty to a lack of prior exposure or limited vocabulary: *"For unknown words, I can easily ask "what is the meaning of the word…," but generating questions to answer myself and dig deeper is challenging." (Student 2)*

Despite this initial unfamiliarity, several students intuitively recognized that asking questions could lead to deeper and more reflective reading:

"It helps me read deeply, think more, interact with the text, and understand the author's purpose and content of each paragraph." (Student 4)

"Asking questions helps me connect with the text, making me want to read more regularly, not just for exam purposes." (Student 6)

This early recognition suggests that students intuitively linked questioning with analytical thinking, though without yet having a structured framework.

4.2.2. Increased Confidence and Cognitive Engagement After Instruction

After learning about Revised Bloom's Taxonomy, students' reflections showed clear growth in confidence and awareness of strategic thinking. Many reported that the framework

provided a structure to organize their thoughts and target different levels of comprehension:

"I felt more confident than in the previous sessions, and I could think ahead about what kind of questions to ask." (Student 1)

"It is slightly easier to generate questions after analyzing Bloom's model." (Student 6)

Several participants also reported more deliberate and flexible thinking when approaching a passage: *"I felt more focused and deliberate, paying attention to where to ask meaningful questions." (Student 7)*

Students further recognized that self-questioning as promoting critical thinking. Many described the need to "compare" or "connect" ideas, which are signs of higher-order cognitive engagement:

"The question level improved as I compared text information with my own knowledge." (Student 12)

"It helped me connect ideas across paragraphs and see the bigger picture." (Student 1)

Metacognitive awareness also became evident as they reflected on how questioning helped them monitor and regulate their understanding:

"It gives me a clearer understanding because I answer my own questions." (Student 2)

"It made me reflect on my comprehension and clarified points I might have missed." (Student 11)

4.2.3. Challenges and Future Intentions

Although most students expressed positive views, not all experienced equal ease or progress. Some continued to find question generation demanding, especially at higher Bloom levels.

"Easy for basic understanding, but harder for questions that require analysis." (Student 11)

"It is still a bit difficult; I am not yet used to asking deep questions." (Student 13)

Language proficiency and vocabulary limitations were commonly cited obstacles.

"My vocabulary is not enough to ask deeper questions." (Student 2)

"It's not too hard or too easy, but I need to build up my vocabulary." (Student 9)

Despite these challenges, most participants viewed the strategy as beneficial, motivating, and transferable to other academic contexts.

"It is effective and helps me critically evaluate my own thinking, not just in English but in developing an independent mindset." (Student 2)

"Besides using it for tests, this method is effective for reading research papers or academic texts." (Student 12)

Overall, the findings indicate that explicit instruction using Revised Bloom's Taxonomy fostered students' awareness of their own thinking processes, enhanced their confidence, and encouraged deeper engagement with texts. At the same time, the results highlight ongoing challenges, including limitations in vocabulary and difficulties in formulating higher-order questions, indicating the need for continued practice and targeted support.

5. Discussion

The study explored how explicit instruction in Revised Bloom's Taxonomy influences the cognitive levels of Vietnamese EFL undergraduates' self-generated reading question, as well as how their views on the strategy developed over time. Results showed a modest but

noticeable shift toward higher-order thinking, evidenced by the emergence of Create-level questions and slight increases in Apply and Evaluate levels post-instruction. Students' reflections also showed a positive attitudinal change, moving from initial uncertainty to greater confidence, strategic awareness, and appreciation of the strategy's cognitive value.

5.1. Alignment with Previous Research and Contextualization

The observed improvement in question quality aligns with prior research showing that SGQ promotes deeper comprehension and active learning (Chin & Osborne, 2008). Students' progression from lower- to higher-order questions reflects increased awareness of Bloom's cognitive hierarchy and more deliberate engagement with text, consistent with findings linking metacognitive instruction to enhanced critical reading (Momen et al., 2022). These results also align with international and Vietnamese studies demonstrating the benefits of explicit self-questioning instruction for comprehension, engagement, and critical thinking (Joseph et al., 2016; Lin et al., 2022; Nguyen et al., 2016; Phan, 2024). Extending prior work, this study provides empirical evidence that using Revised Bloom's Taxonomy as an explicit scaffolding framework can strengthen students' cognitive awareness and support higher-order question generation in a Vietnamese EFL context.

5.2. Pedagogical Implications

The study suggests the pedagogical utility of Revised Bloom's Taxonomy as a practical tool for improving reading comprehension through structured questioning. While often used by teachers to design assessment tasks (Untailawan, 2023), the taxonomy's use as a metacognitive guide for students remains underexplored. This research suggests that when students are explicitly taught how to apply Bloom's hierarchy, they become more aware of their own cognitive processes and more intentional in how they engage with texts.

This offers valuable implications for reading instruction in EFL settings, where learners often rely on teacher-led comprehension and rarely reflect on the depth of their own understanding. First, teachers should integrate training that guides students in generating their own comprehension questions across different cognitive levels, thus encouraging both depth and breadth in reading. Second, embedding opportunities for collaborative question exchange can cultivate peer scaffolding, prompting learners to engage in higher-order questioning and critical dialogue. Third, ongoing practice in categorizing and refining SGQ can promote learner autonomy and sustained metacognitive monitoring.

These findings may also be further interpreted through the lens of metacognitive theory (Flavell, 1979) and self-regulated learning models (Zimmerman, 2002), both of which emphasize learners' active monitoring and control over their cognitive strategies. By positioning Revised Bloom's Taxonomy within these broader frameworks, reading instruction in EFL contexts can shift from a predominantly teacher-led comprehension model toward one that empowers learners to take active and reflective control over their understanding.

5.3. Transferability and Learner Autonomy

In addition to its instructional relevance, the approach appeared to support learner autonomy and long-term motivation. Several students noted their intent to apply the strategy beyond the study's context, particularly in preparation for academic coursework and standardized tests such as IELTS. This reflects the strategy's perceived transferability, as students saw value in using question generation not only for immediate reading tasks but also for broader academic and professional purposes. These findings suggest that self-questioning, when supported by a clear cognitive framework, can serve as a potentially sustainable learning strategy for EFL learners.

5.4. Ongoing Challenges

Nonetheless, the study also revealed persistent challenges. Despite gains in strategic awareness and the emergence of higher-level questions, many students still found it difficult to formulate questions at the Analyze, Evaluate, and Create levels. This suggests that while a single instructional session can raise awareness and introduce the taxonomy, continued practice and support are necessary to internalize and effectively apply all levels of cognitive thinking. Some students attributed their difficulties to limited vocabulary and low language proficiency, which hindered their comprehension and made it harder to generate meaningful questions that promote deeper analysis. This issue is particularly relevant for non-English majors, whose exposure to academic discourse and topic-specific vocabulary may be more restricted. The limited development in this area underscores the need for longitudinal interventions that include repeated exposure, pre-teaching of key vocabulary, and ongoing feedback to help students build confidence and competence in generating higher-order questions during academic reading.

5.5. Limitations and Recommendations for Future Research

Several limitations should be noted. First, the small sample size (n = 15) and brief intervention (three 60-minute sessions) limit generalizability and the assessment of long-term effects; however, the study was intentionally exploratory and qualitative in nature. Second, participants' English proficiency was not controlled, and differences in vocabulary and reading ability may have affected question quality. Third, self-reported reflections may be biased, and differences in applying Bloom's Taxonomy or text characteristics could have influenced the cognitive level of generated questions.

To address these limitations, future research could recruit larger and more diverse samples and systematically account for participants' language proficiency. Longitudinal designs would be valuable to examine the sustained effects of Bloom-guided student-generated questioning on both reading comprehension and critical thinking. Further studies might also explore how peer collaboration, teacher feedback, and digital annotation tools can enhance questioning practices. Finally, comparative investigations between Vietnamese and international EFL learners could help determine the broader applicability and generalizability of these instructional effects.

6. Conclusion

This study investigated the effects of explicit instruction based on the Revised Bloom's Taxonomy on the cognitive levels of students' SGQ and their perceptions of SGQ as a reading strategy in a Vietnamese EFL context. By integrating explicit instruction on the taxonomy into reading tasks, the research demonstrated how a cognitive framework can support students in becoming more reflective and strategic readers.

Rather than focusing on measurable gains, the findings show how students began to internalize a structured way of thinking about questions, highlighting Bloom's framework as both a pedagogical and metacognitive tool for fostering deeper engagement and higher-order thinking. The results also suggest that sustained practice and scaffolding are necessary for learners to fully develop higher-level questioning skills in EFL contexts.

Future research should expand this line of inquiry by employing longer interventions, larger and more diverse samples, and comparative or technology-enhanced approaches. Such studies could further clarify how Bloom-guided questioning contributes to learners' comprehension, critical thinking, and self-regulation across academic and cultural contexts.

References

Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.

Banditvilai, C. (2020). The effectiveness of reading strategies on reading comprehension. *International Journal of Social Science and Humanity*, 46-50. https://doi.org/10.18178/ijssh.2020.v10.1012

Benson, P. (2011). *Teaching and researching autonomy in language learning* (2nd ed.). Routledge. https://doi.org/10.4324/9781315833767

Bharuthram, S. (2018). Facilitating active reading through a self-questioning strategy: student and tutor experiences and reflections of the strategy use. *Journal for Language Teaching*, *51*(2), 85. https://doi.org/10.4314/jlt.v51i2.4

Bloom, B. S. (Ed.). (1956). Taxonomy of educational objectives: The classification of educational goals. *Handbook I: Cognitive domain.* Longmans, Green.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brook-Hart, G., & Jakeman, V. (2012). *Complete IELTS Bands 5–6.5: Student's Book with Answers with CD-ROM*. Cambridge University Press.

Causey, C., & Spencer, A. (2024). Student-Generated Questions: An Exploration of an Instructional Strategy with Young Children. *Thinking Skills and Creativity*, *53*, 101608. https://doi.org/10.1016/j.tsc.2024.101608

Cheng, W., & Yu, F. (2021). *Leveraging context for computer-supported student-generated questions and EFL learning in grammar instruction: Its effects on task performance*. In *Proceedings of the 29th International Conference on Computers in Education (ICCE 2021)*. Asia-Pacific Society for Computers in Education. https://library.apsce.net/index.php/ICCE/article/view/4261

Chin, C., & Brown, D. E. (2002). Student-generated questions: A meaningful aspect of learning in science. *International Journal of Science Education, 24*(5), 521–549. https://doi.org/10.1080/09500690110095249

Chin, C., & Osborne, J. (2008). Students' questions: A potential resource for teaching and learning science. *Studies in Science Education, 44*(1), 1–39. https://doi.org/10.1080/03057260701828101

Eriksson, L. (2022). Difficulties in academic reading for EFL students: An initial investigation. *Language Teaching*, *56*(1), 149–152. https://doi.org/10.1017/s0261444822000246

Fadila, L., Dalimunthe, S. A., & Siagian, N. (2024). Strategies to improve English reading comprehension. *Fonologi: Jurnal Ilmuan Bahasa dan Sastra Inggris*, *2*(3), 16–25. https://doi.org/10.61132/fonologi.v2i3.774

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist, 34(10),* 906–911. https://doi.org/10.1037/0003-066X.34.10.906

Grabe, W., & Stoller, F. L. (2011). *Teaching and Researching: Reading* (2nd ed.). Routledge. https://doi.org/10.4324/9781315833743

Işır, E., & Uyar, Y. (2022). Investigating reading comprehension questions and student-generated questions in language lessons in terms of level. *Education Quarterly Reviews, 5*(4), 440–455. https://doi.org/10.31014/aior.1993.05.04.676

Joseph, L.M., Alber-Morgan, S.R., Cullen, J.M., & Rouse, C.A. (2016). The effects of self-questioning on reading comprehension: A literature review. *Reading & Writing Quarterly, 32*, 152-173. https://doi.org/10.1080/10573569.2014.891449

Lin, C., & Yu, F. (2022). The effect of contextual student-generated questions on efl learners' english learning performance, language learning strategy use, and perceived cognitive load. *International Conference on Computers in Education*, 24-33. https://library.apsce.net/index.php/ICCE/article/view/4566

Maab, S. H., Ramadhanti, S. F., Payung, N. F., & Yulia, Y. (2024). Critical thinking in academic reading: EFL students' perceptions and challenges. *VELES: Voices of English Language Education Society*, *8*(1), 206–219. https://doi.org/10.29408/veles.v8i1.25096

Mokhtari, K., & Sheorey, R. (2002). Measuring ESL students' awareness of reading strategies. *Journal of Developmental Education, 25*(3), 2–10.

Momen, A., Ebrahimi, M., & Hassan, A. M. (2022). Importance and implications of theory of Bloom's Taxonomy in different fields of education. In H. A. El-Miniawi, N. A. Shalaby, & M. A. El-Seoud (Eds.),

Proceedings of the 2nd International Conference on Emerging Technologies and Intelligent Systems (pp. 515–525). Springer. https://doi.org/10.1007/978-3-031-20429-6_47

Monrad, S., Zaidi, N., Grob, K., Kurtz, J., Tai, A., Hortsch, M., Gruppen, L., & Santen, S. (2021). What faculty write versus what students see? Perspectives on multiple-choice questions using Bloom's taxonomy. *Medical Teacher, 43*, 575-582. https://doi.org/10.1080/0142159x.2021.1879376

Msaddek, M. (2020). The incorporation of self-questioning training in the reading comprehension course: The case of Moroccan EFL university learners. *Studies in Literature and Language*, *20*, 6-12. http://dx.doi.org/10.3968/11754

Nguyen, C. D. (2008). Using Bloom's revised taxonomy to design in-class reading questions for intermediate students in the context of Vietnam. *VNU Journal of Science: Foreign Languages, 24*(3), 175–183. https://jfs.ulis.vnu.edu.vn/index.php/fs/article/view/3205

Nguyen, D. T., & Nguyen, T. H. G. (2023). Research on the relationship between reading comprehension questions, Bloom's Taxonomy, and critical thinking competence to adapt to the practical needs of teaching reading comprehension developing critical thinking: A case study of Vietnam. *International Journal of Education Humanities and Social Science, 6*(3). https://doi.org/10.54922/IJEHSS.2023.0513

Nguyen, H. T. M. (2023). The washback of the International English Language Testing System (IELTS) as an English language proficiency exit test on the learning of final-year English majors. *English Australia Journal*, *27*(2). https://doi.org/10.55593/ej.27106a8

Nguyen, T. P. N, Janssen, J., Rijlaarsdam, G., & Admiraal, W. (2016). Effects of self-questioning on EFL students' engagement in literary reading. *Culture and Education, 28*(4), 702-737. https://doi.org/10.1080/11356405.2016.1231759

Nguyen, T. T. B., Tran, T. T. N., & Hoang, T. L. N. (2020). Vietnamese EFL students' critical thinking via reflective journals in American-British literature classes. *Hue University Journal of Science: Social Sciences and Humanities*, *129*(6B), 91–115. https://doi.org/10.26459/hueuni-jssh.v129i6B.5786

Phan, N. T. T., Quang, H. T., & Nhat, T. T. M. (2019). The effectiveness of a TOEIC preparation course on non-English majored students' TOEIC scores at a university in Vietnam. *Journal of Science and Technology – Industrial University of Ho Chi Minh City*, *37*(1). https://doi.org/10.46242/jst-iuh.v37i01.312

Phan, Q. N. (2024). Guiding students to ask themselves questions in teaching reading comprehension of modern Vietnamese short stories in high schools in Vietnam. *International Journal of Social Science and Human Research*, *7*(5), 3079–3088. https://doi.org/10.47191/ijsshr/v7-i05-65

Phuong, H. Y., & Nguyen, L. G. (2018). English teachers' questions in a Vietnamese high school reading classroom. *JEELS (Journal of English Education and Linguistics Studies)*, *4*(2), 129–154. https://doi.org/10.30762/jeels.v4i2.353

Spencer, A., Causey, C. B., Ernest, J. M., & Barnes, G. F. (2020). Using student-generated questions to foster twenty-first-century learning: International collaboration in Uganda. *The Excellence in Education Journal*, *9*(1).

Suhaila, J., Aisyah, S. M. R., Harahap, E. B. K., & Lubis, Y. (2025). Improving reading comprehension skills in reading. *Invention Journal Research and Education Studies*, 477–487. https://doi.org/10.51178/invention.v6i2.2564

Sunggingwati, D. (2009). *Developing teachers' and students' use of self-questioning strategy in an English as a foreign language (EFL) context in Indonesia*. [Doctoral dissertation, The University of Queensland].

Talib, A. B. H., & Abdallah, B. (2023). The Effect of Self-Questioning Strategy on EFL Tenth-Grade Students' Reading Comprehension. *Journal of International Education and Practice*, *6*(2), 1–13. https://doi.org/10.30564/jiep.v6i2.5525

Thi, N. M. T., Le, T. S., & Nguyen, T. P. N. (2024). The effects of self-questioning and perceptions on learning reading comprehension of EFL students at the university level. *Journal of Inquiry into Languages and Cultures*, *8*(1), 84-96. https://doi.org/10.63506/jilc.0801.8

Untailawan, F. (2023). Bloom's taxonomy and reading comprehension in English teaching: Evaluating teachers' questioning. *Journal of Social Sciences and Humanities*, *13*(3), 306–317. https://doi.org/10.31940/soshum.v13i3.306-317

Wilson, L. O. (2001). *Bloom's taxonomy revised.* The Second Principle. Retrieved on May 29, 2025 from https://thesecondprinciple.com/teaching-essentials/blooms-taxonomy-revised/

Wisinski, J., & Yu, A. (2020). Is the Bloom taxonomy level of student-generated exam-style questions predictive of exam performance? *The FASEB Journal, 34*(S1), 03999. https://doi.org/10.1096/fasebj.2020.34.s1.03999

Yu, F., & Chen, H. (2024). The more structured, the better? Learning effects of online scaffolds with different structures for student question generation. *Journal of Research on Technology in Education*, 1-20. https://doi.org/10.1080/15391523.2024.2437747

Zimmerman, B. J. (2002). *Becoming a self-regulated learner: An overview*. *Theory into Practice, 41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2

APPENDIX

All appendices and supplementary data can be accessed through the QR code provided below.