



## Exploring an Inquiry-based Approach to Enhance English Vocabulary Learning: Academy Students' Perspectives

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DOI: <https://doi.org/10.46245/ijorer.v4i5.383>

### Sections Info

#### Article history:

Submitted: May 6, 2023

Final Revised: August 29, 2023

Accepted: September 1, 2023

Published: September 07, 2023

#### Keywords:

Collaboration;

Creativity;

English vocabulary;

Inquiry-based learning;

Vocabulary acquisition.



### ABSTRACT

**Objective:** The objectives of this study are (1) to describe how the IBL approach can improve and motivate students to learn English vocabulary and (2) to explore how academy students believe the IBL approach has improved their English vocabulary. **Method:** This qualitative study investigates the application of the IBL approach and how students address its significance in learning activities at a Computer Science Academy in Ternate, North Maluku, Indonesia. This research sample randomly chose 15 academy students based on their IBL experience. **Results:** Using observation and interviews, the results show that students at the Computer Science Academy used the IBL approach toward learning English, vocabulary, planning activities, retrieving information, assignment processes, creativity skill development, and project sharing. Furthermore, students liked applying the IBL approach in the classroom, particularly in English lessons. The IBL approach also plays a crucial role in improving students' English vocabulary skills. **Novelty:** An essential aspect of using the IBL approach in vocabulary learning is something new that sheds light on the group collaboration process, creativity, and engagement.

### INTRODUCTION

Inquiry-based learning is a cognitive tool that determines how students develop skills and explore the likelihood of reflective practices to advance vocabulary literacy. However, college students find it challenging to learn English vocabulary for a specific purpose replete with technical words in academic contexts (Alamri & Rogers, 2018; Yüksel et al., 2022). For example, students learning computer sciences get insights into the significance of English words in different books; laboratory exercises are conducted using computer tools and devices demonstrated in English. Numerous task applications emphasize input- and output-based tasks and demand English proficiency to encourage students' engagement in honing memory formation and retention (Kaivanpanah et al., 2020) when learning EFL new words using multimedia input (Teng, 2022). In addition, it is beneficial in all aspects of modern life, including business, technology, and the financial system, to mention a few. Therefore, a good command of vocabulary learning strategies involving memory, tenacity, cognition, or metacognitive strategies is required for students who recognize the increasingly significant role of using a diverse range of English vocabulary to achieve excellent learning outcomes (Ghalebi et al., 2020).

Some evidence from previously published studies shows that vocabulary learning can be challenging for the English lecturer to help the students improve their English skills. This practice seeks to assist them in learning vocabulary through writing assignments (Kamali et al., 2020). Moreover, students indeed update word lists in context to help themselves learn other language skills, which aligns with the objectives Of the English lessons described in the college curriculum. Therefore, it is urgent to achieve what truly matters with a language student's average comprehension of

communication, vocabulary mastery to support the four linguistic skills (Shin, 2018,) and vocabulary knowledge (Fung & Chung, 2021) by providing more space for those studying English as a foreign language, particularly vocabulary learning (Lotfolahi & Salehi, 2017) and task-related vocabulary acquisition (Taheri & Golandouz, 2021). As mentioned earlier, learning vocabulary results in assistance, assignments, and mastery of up-to-date terms that can be utilized in context-sensitive conversations.

When used to teach vocabulary, inquiry-based learning can be an ongoing approach to start in-class discussions and investigate concepts that open up possibilities for creativity, visions, and forms (Gulla & Sherman, 2020). Most of all, students gain their capacity to be self-reliant, which underlines the social context of practice and the applicability of educational ideas, including independent thinking and newly acquired information (Bippus & Gaspar, 2019). When it comes to vocabulary development, the exploratory stages of scaffolding new terms involve vocabulary-designed tasks using severe games or puzzles (Bergström, 2023; Lamerias et al., 2021), and the influence of social contexts on technical words, the learning processes in such educational settings. Independent learning sessions guide students through activities that adhere to the actualization of interaction embedded in vocabulary development and content (Bergström et al., 2023). Due to their motivation to learn vocabulary through digital video games (Ebrahimzadeh & Alavi, 2016), students who participate in autonomous learning schemes can use new terms that pertain to current events and newly acquired knowledge. Likewise, critical thinking skills can be developed through the learning unit, where students act as learning community members and start conversations to foster a communication culture. Concepts or ideas connect to their understanding of teamwork and behavior in the specific learning community (Chu et al., 2017).

In the digital era, through online resources linked to computers and other technological devices, students can acquire vocabulary independently (Shokrpour et al., 2019) using mobile-assisted learning (Zakian et al., 2022) and online dictionaries (Ebadi et al., 2022). To address such insights, the lecturers use a framework for online learning that allows for telecollaboration or virtual exchanges (Ismailov, 2021), collaborative inquiry abilities (Alsaheed, 2022), theoretical concepts, and distinct learning cultures, resulting in inquiry-based learning in real-world learning situations (Louca et al., 2018). However, the difficulties and obstacles that are most typically identified while applying inquiry-based learning cope with low vocabulary awareness related to phonology (Porta & Ramirez, 2020), morphology (Xie et al., 2021), metalinguistics (Candry et al., 2017), and metaphors. Nevertheless, even online inquiry-based learning can improve students' learning results (Siantuba et al., 2023). Other pertinent difficulties align with technical vocabulary (Chien, 2019), word recognition, issues in pronouncing them, lack of knowledge of collocations, unawareness of vocabulary used in daily life, and untapped skills to use the words interactively (Wang, 2018). In this circumstance, the focus is on how inquiry-based learning is combined with vocabulary acquisition and awareness, which emphasizes virtual collaboration, comprehension of cultures in which specific terms are used daily, and contextual cues of social meanings and trending topics.

Inquiry-based learning has been widely regarded as one of the teaching and learning approaches that amplifies students' specific curiosity and critical thinking skills because it concentrates on analysis, inference, self-regulation skills, explanation, interpretation, and evaluation (Wale & Bishaw, 2020). For instance, inquiry-based writing instructions that underline observing, inquiring, examining sources, gathering, interpreting, and

evaluating data can help students develop their writing skills (Wale & Bogale, 2021). These scientific learning processes significantly impact the extent to which students become autonomous in pursuing their vocabulary knowledge for academic purposes (Masrai et al., 2021), seeking out what they want, researching, and discovering new words. They can freely ask questions and conduct investigations and experiments under the lecturer's supervision to accompany mostly inquired learning sessions. They actively participate in the learning processes in order to develop concepts and gain comprehension of contextual vocabulary. This is strongly consistent with what Pedaste et al. (2015) assert that students think critically about many scientific issues as part of their inquiry-based learning, which is desirable for e-learning options to advocate for both low and high-achievers (Sotiriou et al., 2020). They are taught, for instance, how to describe problems, create hypotheses, arrange and conduct behavioral assessments, draw conclusions, and explain processes and effects to others so that they can begin discussing problems (Pedaste et al., 2015) under investigation.

The substantial purpose of an inquiry-based approach is to solve problems using inquiry-based skill sets, technological breakthroughs, student-content communications, and behavioral involvement (Al-Mamun & Lawrie, 2023). Reinforcement of this argument demonstrates how learning promotes self-regulatory processes that begin with self-interest and progress through formulating research topics and hypotheses and managing data gathering. The ongoing inquiry involves acquiring information and drawing conclusions based on mind-mapping principles and critical thinking. Undoubtedly, the Inquiry-Based Learning (IBL) approach is becoming more generally accepted in academic curriculum platforms, particularly for teaching and implementing projects for research and development worldwide. One of the crucial reasons for this approach is that recent technological advancements have enabled the inquiry process to support inquiry-based instructions that transform learning communities. It is also fully supported by a student-centered learning environment, which has substantially enhanced students' achievements and experimental skills, making learning sciences fascinating (Pedaste et al., 2015).

A standard structure for inquiry-based learning is the inquiry cycle, which comprises various stages or phases of inquiry. IBL is an educational model in which students use techniques and procedures comparable to those trained scientists use to acquire knowledge. This approach is also described as identifying new causal links that consistently assist students in creating hypotheses and testing them by conducting experiments and making observations collaboratively. Likewise, it involves inductive and deductive reasoning through experimentation. As a result, students can learn about an inquiry-based model, science process skills, and involvement in encouraging critical and theoretical components corresponding to artistic endeavors (Yulkifli et al., 2019; Costes-Onishi & Kwek, 2023).

The previously described views imply that students' vocabulary abilities enable them to understand the terms, relearn them, and use them in various situations amid technological advancements and digital transformations. However, inquiry-based learning promotes the humanities (Feldt & Petersen, 2021), indicating that Human values take precedence over the technological tools applied to learning activities. In truth, technology and humans complement one another in learning innovations. Other components of an inquiry-based learning model that complement a science process skills approach include independent learning, vocabulary knowledge, a desire to create new words, and the capacity to use the words in everyday circumstances.

However, as previously indicated, the earlier studies align with the current study investigating inquiry-based learning for academy students, leading to growing research gaps and a need for comparable research in the Indonesian setting. The present study reaffirms these fundamental ideas, emphasizing the inquiry-based learning approach in actual vocabulary learning in contexts for academy students. Therefore, this study describes the IBL approach that can enhance and inspire students to learn English vocabulary and explore whether academic students contend that the IBL approach has enhanced their learning achievements. Recently, more emphasis has been given to an inquiry-based approach to learning vocabulary, particularly when it comes to the contributions of an inquiry-based approach to vocabulary development, body of knowledge, and academy students learning English. Having the capacity of an inquiry-based approach to encourage active participation and a complete understanding of terminology is one of its most significant accomplishments. By encouraging students to investigate, ponder, and examine new terms through inquiry-based exercises like idea mapping, word associations, and contextual analysis, instructors may help students actively engage in the learning process. Students use this hands-on approach to make connections, pick up on subtleties, and memorize words more quickly.

Inquiry-based learning promotes the formation of a substantial body of knowledge by encouraging students to examine linguistic structures, look into word origins, and analyze language trends. Through inquiry-based projects, students gain a deeper understanding of language concepts and principles, improving their ability to express ideas clearly and concisely. Additionally, this approach strengthens students' capacity to apply learned information in various situations and builds critical thinking skills. Students studying English as a foreign language in academic settings benefit most from the inquiry-based approach. By involving students in real-world language tasks, this technique encourages the usage of terminology in everyday situations. Inquiry-based learning also encourages language interaction, teamwork, and problem-solving, enabling academy students to develop not just their linguistic skills but also their academic and communication skills.

## **RESEARCH METHOD**

### ***Type of Research***

The present research is descriptive and qualitative. The research findings are presented descriptively to address the query in the problem statement. According to Merriam & Tisdell (2016), a qualitative research approach is applied when the investigation tries to understand how students interpret and value their experiences. This study was conducted in 2022 at a Computer Science Academy in Ternate, North Maluku, Indonesia. The object was chosen based on the researchers' preliminary findings, precisely the students' first-semester English skills. Using an IBL approach in the classroom can motivate students to learn and enhance their language skills.

### ***Subject and Object***

The first-semester students were selected for the course because they took English classes and were expected to have experiences with IBL. The researchers used a randomized technique to select 20 students from 40 to engage in this research program; however, only 15 students agreed to participate in the interview procedure. The primary random sample approach came into play in the investigation. According to Sutrisno (1993), random sampling provides each member an equal chance of being

gathered as the sample. Therefore, this study's sample size is 20% of the total population.

Following Arikunto (1993), including all subjects to qualify the study as population research is preferable if there are at most 100 subjects. It relies on the researchers' skill level, views of time, effort, and cost, and the breadth of each subject's research areas as it only involves a small quantity of data. However, if the subject count is higher than expected, it can be taken between 10%-15% and 20%-25%. The magnitude of the risk and a more significant sample yielded better results for research with a high degree of risk. The goal is to teach students English vocabulary through inquiry-based learning in the first semester of a Computer Science Academy in Ternate, North Maluku, Indonesia.

### ***Data Collection Technique***

The researchers used both observation and interview as methods for gathering data. According to observation, the researchers then visited the class to watch how the students were learning to ensure the IBL activities. The observation also involved meeting the students to learn about implementing IBL. In terms of the interview, the lecturer's prior knowledge, the study's aim, and a literature review are used to design the interview questions. During the lecture day, they conducted individual interviews with each student that took about 25 to 30 minutes and consisted of 6 questions. In line with Patton's (2015) argument, qualitative research enables researchers to gather retrospective data from participants by inspiring them to reflect on and discuss a previous occurrence. For this study's qualitative technique, motivational graphs, semi-structured interviews, and prompted recalls were utilized to gather information from participants.

### ***Data Analysis Technique***

First, the researchers observed the teaching and learning process in the classroom. Next, they interviewed the English lecturer regarding implementing IBL and the students' perceptions of IBL in vocabulary learning. Finally, they conducted interviews with the sample group of 15 students. Three steps are included in the data analysis techniques:

#### ***Data reduction.***

A qualitatively documented research effort yielded more data than in the final report. However, participating in the data reduction process significantly and positively impacted the data editing, summarizing, and presentation (Mezmir, 2020).

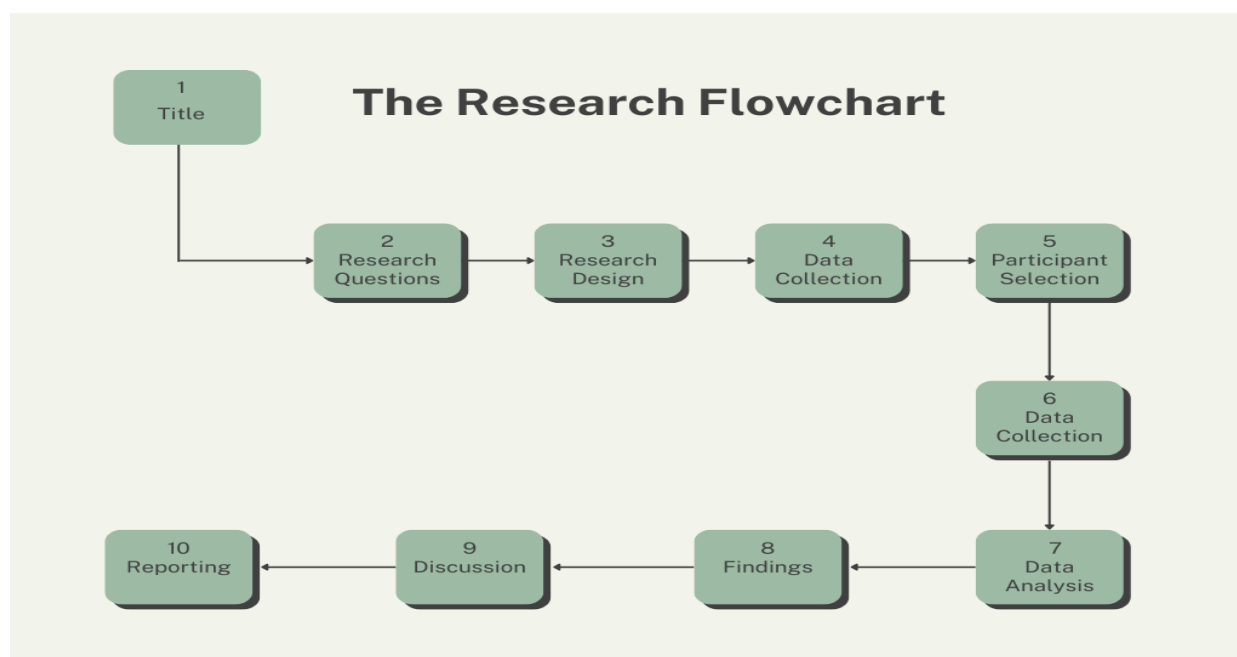
#### ***Data display.***

Data display is frequently accomplished by selecting segments that best show concepts of interest while employing textual representations of data. Reading and repeating data transcriptions, writing notes in the margins (often referred to as research memos, and underlining major areas or themes as illustrations of specific topics are examples of standard procedures).

### ***Drawing Conclusion***

The final stage of the analysis is to make significant claims about how the data shows the topic of interest. This step requires generating meanings from the data displayed. In this context, the precise sense of "concluding" rests on the analysis used to extrapolate

the data's pertinent meanings, structures, and processes. The research flowchart can be drawn as in Figure 1.



**Figure 1.** Research flowchart.

## RESULTS AND DISCUSSION

### Results

The results of this study highlight the use of the IBL approach in English vocabulary learning, as well as students' perceptions of IBL's effectiveness in enhancing English vocabulary mastery. The 15 students were interviewed individually during college lectures, utilizing Indonesian to express themselves thoroughly. The interview was supposed to last 15 minutes but was extended due to the students' eagerness to answer questions on the IBL method. The data collected from the students, two males and thirteen females, were then coded to aid in classification and verification. For example, S1-M/F represented student number one (S1), who was in the first semester and was male/female (2M). The interview results are described in Table 1.

**Table 1.** The interview questions list.

No.	Questions
1	In your opinion, how would you describe the IBL approach?
2	What do you think about implementing the IBL approach in your classroom?
3	Has the use of IBL improved your vocabulary? How is it so?
4	How do you perceive the IBL approach in improving your English vocabulary?
5	What do you like best about using the IBL approach to teach vocabulary?
6	Are there any technologies, media, strategies, or methods that could improve the fulfillment of the IBL approach?

### Implementing Inquiry-based Learning in Teaching English Vocabulary to Academy Students

As stated in the research method, the researchers used a qualitative technique to conduct this research, with interviews and observations as data collection techniques.

However, observation is more about tracing activities and the IBL learning process used in the classroom by the lecturer when teaching English vocabulary. The results of observations were then used as a reference to create a list of questions to obtain accurate and precise results, and the interview list was also adopted from several studies and then modified. Researchers conducted the observation process by visiting the class directly, observing the activities and learning processes in the classroom conducted by the English lecturer three times, and conducting online observations two times.

This online observation of the lecturer's teaching activities took place on campus, where the lecturer continued to use an online and offline teaching and learning process system. As a result, researchers focused on the lecturer's IBL approach when teaching English during the 5-time observation stage. Based on this observation, the lecturer designed a method for immediately measuring students' readiness to deal with the material and begin with the teaching material. This method is implemented before beginning the topic or learning material for the day. Finally, the lecturer returned to address a brief inquiry about the material provided that day.

This question concerns students' knowledge of whether they have heard, read, or studied the material. The following stage is a discussion of the learning topic. Next, the lecturer must spend more time explaining the material in this teaching and learning process, providing a brief description before assigning individual vocabulary tasks (Kamali et al., 2020) and group projects. There are instructions from the lecturer in the process of giving this assignment that instill creativity, the ability to work on their assignments, and collaboration in individual and group assignments. Several students can be seen asking their friends, lecturers, and occasionally group friends about the project assignments given, demonstrating their creativity and collaboration. Ultimately, The researchers found that the current phase was based on the observation that the lecturer executes several steps when instructing in the classroom by applying the IBL approach, including planning procedures, information retrieval, the assignment process, creativity, skill development, and project sharing.

This first question elicited various responses and points of view. Overall, all students responded but needed clarification on whether the answer was correct or not at all. One student, S1-M, affirmed that the IBL approach began with planning, assignments, and projects from the lecturer. The average response is based on how they feel. According to five students, S1-M, S7-F, S11-F, S6-F, and S15-F, the IBL approach is a planned learning process that includes collaboration and creativity in the teaching processes. These viewpoints are repeated because all students sometimes only remember the first step of the IBL approach. According to four students, S10-F, S2-F, S14-F, and S5-F, IBL is an approach for quickly mastering English vocabulary, creativity, and skill development.

While the remaining six participants merely stipulated that the IBL approach was suitable for independent study, they needed to express their points of view clearly or provide any insights that led to the IBL approach. They only outlined that the IBL strategy could result in autonomous learning, enhanced English language skills, and timely collaboration. According to S3-M, S4-F, S9-F, S12-F, S13-F, and S8-F, the IBL approach triggers collaboration in the teaching and learning processes. As a result, the advantages of implementing an IBL approach in the classroom are intended to show how students comprehend the process of IBL activities and processes. The outcome is shown in Table 2.

**Table 2.** Students' responses to the IBL perspectives.

Students	Aspects	Responses
S1-M	Planning Process	The IBL approach will be performed, with planning and knowledge delivered through activities.
S7-F	The planning process and project sharing	The IBL approach requires the completion of a plan and related tasks. However, sharing the results of learning is delightful as well.
S2-F	Planning process and creativity	IBL is a collaborative and creative learning process that begins with an explanation from a lecturer.
S6-F	Planning Process	The IBL approach fosters collaboration, which begins with revising learning plans.
S15-F	Collaboration and planning	IBL is a teaching and learning approach that underscores collaboration and planning before implementing instruction. As a result, the concepts and resources are thoroughly introduced to the students.
S10-F	Teaching approach	IBL is an approach for students to learn English quickly. It is a vital part of teaching that motivates the lecturer to involve students in scientific collaboration and problem-solving stages.
S11-F	Teaching approach and creativity	IBL is an approach that assists students in promptly acquiring English language skills. It also encourages the lecturer to be innovative while teaching English terms.
S14-F	Teaching approach and skill development	IBL is an approach that can assist students in enhancing their English language abilities.
S5-F	The approach to learning English.	IBL is an approach for students to learn English vocabulary efficiently.
S3-M	Independent learning	The IBL approach is an excellent way for students to learn English independently.
S4-F	Independent learning	Independent learning is also feasible when the IBL approach is applied.
S9-F	Independent learning	The approach allows students to learn independently.
S12-F	Independent learning and creativity	IBL is an approach to self-directed learning activities.



Students	Aspects	Responses
S13-F	Independent learning and skill Development	Students can learn independently after comprehending and utilizing the IBL approach.
S8-F	Collaboration	These are descriptions of the procedures for cooperation that are part of the IBL approach.

### **The Application of Inquiry-based Learning in the Classroom.**

At this point, questions probed students' perspectives on using the IBL approach in the classroom. Of course, they are the ones who come up with the responses. As many as seven students, S3-M, S5-F, S7-F, S9-F, S11-F, S15-F, and S13-F, claimed they liked the IBL approach used in the classroom, particularly in English lessons. Three students, S11-F, S4-F, and S14-F, added that the IBL approach applied in the classroom aided their English learning and vocabulary mastery. However, the reasons varied; S1-M and S8-F argued that the IBL approach encourages students to be creative, while the others liked the IBL approach because it inspired them to collaborate. The remaining two, S12-F and S10-F, agreed that implementing the IBL approach in the classroom benefited learning activities. In addition, the IBL approach was well-organized throughout the course, as evidenced by how the lecturer guided students from beginning to end. The IBL approach also assists them in completing tasks, finishing work together, and having enough time to study and understand the topics.

### **Academy Students' Views of How IBL Use Affects Their Vocabulary Skills**

In this third question, students express more about the virtues and benefits of the IBL approach closely related to their experiences, prior knowledge, and what they feel and what happens to themselves or their friends, despite the researchers' inability to avoid similar answers from the previous question. According to one of the students, S4-F, The IBL approach is appropriate for students with a strong command of mastering the English language vocabulary. The rest could be more substantial in acquiring specific words, while those with foundational solid knowledge benefit from the IBL approach. The other two, S5-F and S9-F, add that seeing the IBL approach to increasing the capacity depends on each student's abilities. They both seemed skeptical about whether or not they could be competent in English solely through the IBL approach.

Furthermore, students S11-F, S15-F, and S13-F responded positively. They expressed the same insight regarding the IBL application and its connection to enhancing their English language skills and vocabulary knowledge. The IBL approach proves useful because students can share their experiences and have plenty of time to ask questions if they need to understand the topic. Some students believed the IBL approach helped them improve their English vocabulary. The researchers then assumed that such was the reason at hand. S6-M emphasizes that the IBL approach is advantageous for beginners because the learning process is layered, from plans to assignments. For instance, S12-F explained that the IBL approach helps them memorize vocabulary; S14-F, which is good for understanding vocabulary but must be supplemented with a dictionary; and S6-M, which is good for understanding vocabulary but must be supplemented with a dictionary. As a result, the IBL approach resonates with S3-M, S1-F, and S7-F as being fascinating and exciting. As stated by S8-F, the lecturer must also outline the advantages of successfully using the IBL approach. The details must be

repeated if students still require IBL approach clarification. Similar to the categorization, some still require assistance with the material.

### **Academy Students' Perceptions of IBL in Improving Their English Vocabulary**

The direction of the questions, which are broad and based on their knowledge and experience and lead to the IBL approach and its implementation, is why many answers to question number four are similar to and repeated from the answers to the previous question. All students agree that expanding their vocabulary using the IBL approach is a good strategy. S1-M, S7-F, S14-F, S7-F, S3-M, and S13-F assert that implementing the IBL approach in the classroom to teach English and vocabulary can develop students' creativity and autonomy. The other three, S6-F, S15-F, and S11-F, focused on how IBL can enhance students' English vocabulary since it enables them to recall the terms easily and incorporates practice. Moreover, S9-F, S12-F, and S10-F concurred that IBL encourages students to work jointly on projects and think critically. Examples S8-F and S2-F, for instance, clarified that IBL could reinforce vocabulary knowledge since it entails a collaborative process and encourages students to manage their time to complete the specified tasks. Unfortunately, the last two are mute on the topic at hand.

### **The Majority of Academy Students Prefer to Use the IBL Approach when Learning Vocabulary**

Researchers believe that the several responses to this question are the results of what they experience and witness. Planning, information retrieval, project processing, creative abilities, and project sharing are the five stages of the IBL approach used in classrooms. Data from students (S1-M, S2-F, S4-F, S6-F, S15-F, and S10-F) demonstrate that they enjoy the IBL approach's group cooperation process, which occasionally involves participating in games, their favorite in-class activity. The other kids, S3-M, S5-F, and S7-F, prefer an independent learning method; they are told to locate and consider the work individually. Others who commented on this asserted that acquiring new vocabulary while reading was delightful because the IBL approach helped them remember more words (S8-F, S9-F, and S11-F). Also, S112-F and S14-F mentioned that they appreciate the IBL approach because of the lecturer's teamwork and support if they grapple with the issue. At last, S13-F experienced compassion for them without expressing any particular preference.

### **Academy Students' Perceptions of Technologies that Make IBL More Comfortable**

The investigation focuses on technology, media, techniques, and other strategies to support the IBL approach. The lecturer used them in the classroom, which enhanced the appeal and comfort of the IBL approach. While learning, students used computers and occasionally online dictionaries in group projects, but this is what the researchers witnessed during class observations. Consequently, students (S1-M, S2-F, S3-M, S10-F, S12-F, S7-F, S11-F, and S6-F), who occasionally use computers and other internet-connected devices, claim that this technology application is adequate. This demonstrates the efficiency of the IBL approach in the classroom. The other students (S13-F, S8-F, and S5-F) then discussed how visual media could increase their motivation to learn and recall information. This could make them feel more at ease while learning. According to S14-F, there is sufficient usage of technology and media. Another student (S15-F), with a view on the strategies and methods being used, claims that groupings should be balanced between advanced and basic levels because some students are more

intelligent than others and have better English-speaking abilities. Assignments for projects should also match the abilities of the group. Students S9-F and S4-F are more likely to play games because they feel more comfortable in IBL approach-based classes, in addition to the students' perspectives.

### *Discussion*

#### **The IBL Application and Students' Perceptions of IBL in Learning English Vocabulary**

The steps in the IBL approach applied in the classroom by the English lecturer who teaches include project sharing, information retrieval, the assignment process, the development of creative skills, and planning. Therefore, the lecturer should follow these five steps or phases when teaching English vocabulary while actualizing the five steps or phases. Furthermore, these findings are congruent with the principle of Mieg's (2019) IBL approach, which students can utilize to develop their skills, creative thinking, and cooperative abilities. Therefore, the classroom lecturer already found all this information necessary to support instructional activities.

This approach enables students to formulate hypotheses and test them to identify new causal linkages using observations and experiments (Pedaste et al., 2015). The IBL approach comprises various problem-solving techniques and learners' engagement and ownership in acquiring new materials. The second area for student feedback was using the IBL approach in the classroom. According to the students' positive responses, the IBL approach was successfully applied in the vocabulary and English lessons. Seven participants of the 15 samples claimed they preferred the IBL approach in the classroom as it can motivate them to acquire English vocabulary, as indicated by their fascinating experience.

Furthermore, when the style and emotion of the learning approach coincide, students will learn autonomously. This shows that IBL encourages them to learn effectively. Other students' responses indicated that the IBL approach aided their learning processes. They did not, however, provide a thorough explanation of how or why this was the case, and the researchers did not require them to disclose additional details about their insights in this situation. The IBL approach encourages creativity and a desire to learn through group learning or collaborative project work. In contrast, the two students' comments already point to different causes. This is consistent with the viewpoints of two other students who indicated that implementing the IBL approach in the classroom was adequate – as long as the lecturer offered clear instructions from start to finish, assisted with assignments, and allowed enough time for group study and discussion. In their responses to the first question, students mentioned this step in the IBL application process.

The students' perceptions of how the application of IBL has affected their vocabulary skills are also discussed. Furthermore, the target questions concerning how students participate in IBL are more critical. They also claimed whether or not their vocabulary skills have improved due to IBL or how it has affected their vocabulary skills. In light of the previous question, the third one is still important. Hence, the outcomes are comparable. The IBL application aids in improving students' English skills. However, students must have a fundamental understanding of the subject matter, which they formed based on their experiences, observations, and feelings. This is based on their observation that IBL is effective. However, they might feel

overwhelmed if their command of the English language is less proficient or more crucial than expected.

This backs up previous claims that the IBL approach can increase English language abilities and that everyone has a varied level of vocabulary mastery. The IBL approach can help students improve their skills and positively impact them, but it also considers how well they perform. For example, grouping tasks can be used to predict a student's knowledge, and the difficulty of each group varies. The IBL approach undeniably impacts students' abilities; three students contend it enhances their English language competence. It is linked to Lin's (2015) research that groups using an IBL approach fared better than groups using a non-IBL approach when leveraging vocabulary from the list in writing tasks. Compared to their peers, participants in the IBL approach used a higher percentage of vocabulary that was longer than 2000 words, and they wrote extensive compositions overall.

In contrast, it is challenging to distinguish between IBL activities and learning processes that enhance students' vocabulary abilities because students need to be given sufficient time and attention. Irawan et al. (2019) added that the IBL approach raised students' speaking ability scores from 40, 27 to 51, and 33. The rising scores were based on vocabulary, grammar, fluency, and pronunciation. Students can learn additional English vocabulary when they work in groups to complete tasks or participate in discussions. This information was gathered through the question-and-answer session and discussion. During application, lecturers usually remind students to use as much English as possible, although occasionally, as observed by researchers, they need to use a dictionary more frequently. The ability to accept students differs for each lecturer, but some offer input so that the lecturer adequately describes the current learning process to perfection in this third question.

The topic of discussion at this point is the same as interview question 4, which asks students to respond with information about how they perceive the IBL approach and how that perception relates to how their English vocabulary skills have improved due to using the same approach in the classroom. In essence, the IBL approach encourages students to be creative and capable of completing assignments and solving problems. Two students explicitly stated that the approach could improve their English vocabulary skills because it triggered them to remember vocabulary with more intense exercises. The answers in this item are comparable to those in the previous questions. As Yulkifli et al. (2019) noted, the learning and teaching process using the IBL approach with a science process skills approach can develop students into individuals who can access information and understand where the information can be accessed. In addition, the IBL approach allows them to work collaboratively and individually while managing time to complete assignments.

Regarding question 5, which asks students to identify their preferred part of the learning and teaching process utilizing the IBL paradigm, a wide range of fascinating topics and responses can be discussed. The IBL approach, which involves stages or phases, remains the research's central interest. To ensure that the IBL approach is engaging and varied, as was evidenced in the research, the lecturer must make innovations while considering the state of the students in the classroom setting, space, and environment. The creative lecturer maintains IBL's effectiveness, which can expand due to his ability to switch up how he delivers the material. Students' responses to this question could demonstrate the future usefulness of the IBL approach. For instance, six students were asked to describe what they enjoyed most and responded that they loved

the grouping and collaboration process. Others claimed that what made the IBL approach fascinating was the independent learning process, which taught students how to research and reason independently about the task at hand.

Another student mentioned how exciting the IBL approach is because there is adequate time for practice and reading, which can boost the memorization of more words and support vocabulary development. Some students enjoyed the lecturer's guidance and participation in IBL. Even the final two students said they liked every part of the procedure without mentioning the most enjoyable part. The IBL phase involves project planning, information retrieval, creativity skills, and project sharing, involving students in an actual scientific discovery process while motivating them. The complex scientific process is segmented into more digestible, logically connected parts that guide students and emphasize substantial aspects of scientific reasoning from a pedagogical perspective. These discrete components are inquiry phases; their links make up an inquiry cycle. Many phases and cycles of inquiry are described in the educational literature—for instance, Five inquiry steps: engagement, exploration, explanation, elaboration, and evaluation. The five survey phases are similarly listed in the survey cycle described; however, they are referred to as questions, predictions, experiments, models, and applications instead. These examples demonstrate that the early stages of the 5E cycle (engagement and exploration) start with an inductive (empirical/data-driven) approach, one of the noticeable contrasts between them.

Concerning the use of media, techniques, and methods to implement the IBL approach later in class, the last question is more likely to invite students' feedback about the IBL innovation in the classroom to make it more cozy, fascinating, and motivating. The IBL approach seeks to use media efficiently in light of previous insights. Most students answered that there was no compelling reason to change their approach to learning because they were material-savvy and familiar with the current media. Another comment claimed that using any media will increase students' desire to learn and remember terminologies. This is understandable, given that the students are accustomed to incorporating media into their instructional activities. After all, they are computer students who are well-versed in technology.

The necessity for a balance between beginner and expert levels in group structure has been highlighted in several comments. This is an example of the IBL approach, in which the lecturer must keep an open mind on how the students carry out their inquiry activities scientifically (Rönnebeck et al., 2016). The tasks are also modified depending on the skill level of the group. Another response to the question is incorporating games into teaching and learning activities that adhere to an IBL approach. The lecturer who wants to use the IBL approach in the classroom will find it exceedingly tricky because both fall within the approach and the technique categories. Instead, IBL can be adapted to students' needs and preferences to help them feel comfortable, motivated, engaged, included (West et al., 2023), and enthusiastic to learn.

## CONCLUSION

The **fundamental findings** indicate that students implement planning strategies, information retrieval, assignment process, creativity skill development, and project sharing at a Computer Science Academy in Ternate, North Maluku, Indonesia. Three students indicated that using the classroom's IBL approach aided their acquisition of English. However, the explanations offered varied. Of these 3, two said the IBL approach fosters creativity. In contrast, the third said he loved the IBL approach

because students collaborated while learning and discussing. The remaining two students said that the IBL approach benefits students learning in the classroom. In addition, the IBL approach was well-organized throughout the course, as seen by how the lecturer led the students from the beginning to the end. The IBL approach also helps students to complete tasks collaboratively and have plenty of time to study and comprehend topics.

The pedagogical **implication** is that the IBL approach helps students learn English vocabulary better, even though quantitative data may likely support this claim. The IBL approach encourages students to be imaginative, capable of completing tasks and solving difficulties, increase their English vocabulary, and manage their time to complete projects. In addition, it allows students to grow personally and professionally in groups and independently. When groups collaborate on vocabulary, games may occasionally be used. The others remarked that they enjoy conducting individual research and independent thought. Others responded that the ability to practice and read with more vocabulary is what they found interesting about the IBL approach. In addition, it encourages us to memorize more vocabulary. Students also stated that they enjoy the IBL approach because it encourages teamwork and provides advice from the instructor if they need clarification on a concept. The final group, however, thought they loved each other equally without expressing a preference.

The **limitation** of this research lies in the fact that a small number of students participated in applying the IBL approach, which plays a significant role in helping them develop their English vocabulary. Therefore, the research variable should be measured using a large number of participants to see how the IBL approach can improve English vocabulary skills, despite their claims that using IBL in the classroom to teach English and vocabulary fosters creativity and gives students the confidence to complete projects or challenges on their own. In this sense, IBL allows them to assume they can work collaboratively on challenging assignments. In addition, by improving their language skills, the IBL approach can better manage their time to accomplish the assigned project assignments. Furthermore, students' evaluations of inquiry-based learning are effective in improving their English vocabulary proficiency.

**Future researchers** in the same field are encouraged to use technologies to implement the IBL approach because it is effectively applied in the classroom. Other participants in the media conversation emphasized using visual media to boost the desire to memorize and keep learning. This may make students feel more at ease while studying. Furthermore, project assignments should be aligned with the group's abilities to use learning media and technologies.

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