

**THE INCORPORATION OF INQUIRY-BASED LEARNING
WITHIN DICTOGLOSS TECHNIQUE IN ENHANCING
STUDENTS' LISTENING COMPREHENSION**

(A Thesis)

By

**Purnama Hanan Murod
NPM 2323042011**



**MASTER IN ENGLISH LANGUAGE TEACHING STUDY PROGRAM
LANGUAGE AND ARTS EDUCATION DEPARTMENT
TEACHER TRAINING AND EDUCATION FACULTY
LAMPUNG UNIVERSITY
BANDAR LAMPUNG
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ABSTRACT

THE INCORPORATION OF INQUIRY-BASED LEARNING WITHIN DICTOGLOSS TECHNIQUE IN ENHANCING STUDENTS' LISTENING COMPREHENSION

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This research investigates the effectiveness of incorporating Inquiry-Based Learning (IBL) with the Dictogloss technique on students' listening comprehension and explores student perceptions toward this pedagogical intervention and the use of synthetic (AI-generated) voices. The study employed a pre-experimental method using a one-group pre-test and post-test design. The sample consisted of 30 students from MAN 1 Bandar Lampung. Data were collected using listening comprehension tests (pre-test and post-test) and two sets of Likert-scale questionnaires to assess perceptions of the learning method and the synthetic voice technology. The quantitative data were analyzed using the Wilcoxon Signed-Rank Test due to the non-normal distribution of scores.

The results revealed a statistically significant improvement in students' listening comprehension scores ($p = 0.009$), with the mean score increasing from 80.17 to 84.33. Regarding specific listening aspects, Detail Recognition demonstrated the highest improvement followed by Vocabulary and Sequence Recognition, while Main Idea and Inference showed the least improvement due to a potential ceiling effect. The perception analysis indicated a near-universal positive response (96.7%) toward the IBL-Dictogloss technique, particularly in the dimensions of social interaction and motivation. Furthermore, while students responded positively to the use of synthetic voices for promoting independent problem-solving (73.3% agreement), the study identified technical limitations regarding the clarity of directions. This research concludes that incorporating IBL with Dictogloss is an effective strategy for enhancing listening skills and learner autonomy, though the implementation of synthetic voice technology requires optimization for direction delivery.

Keywords: *Listening Comprehension, Inquiry-Based Learning (IBL), Dictogloss Technique, Synthetic Voice, Students' Perception.*

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By

PURNAMA HANAN MUROD

**Submitted in Partial Fulfillment of the Requirements for
Master's Degree in English Education**

In

**Language and Arts Education Department
Faculty of Teacher Training and Education**



**MASTER IN ENGLISH LANGUAGE TEACHING STUDY PROGRAM
LANGUAGE AND ARTS EDUCATION DEPARTMENT
TEACHER TRAINING AND EDUCATION FACULTY
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Research Title : **The Incorporation of Inquiry-Based Learning Within Dictogloss Technique in Enhancing Students' Listening Comprehension**

Student's Name : **Purnama Hanan Murod**

Student's Number : 2323042011

Study Program : Master of English Education

Department : Language and Arts Education

Faculty : Teacher Training and Education



APPROVED BY
Advisory Committee

Advisor

Prof. Dr. Flora, M.Pd.
NIP 19600713 198603 2 001

Co-Advisor

Prof. Dr. Muhammad Sukirlan, M.A.
NIP 19641212 199003 1 003

The Chairperson of the Department
of Language and Arts Education

Dr. Sumarti, S.Pd., M.Hum.
NIP 19700318 199403 2 002

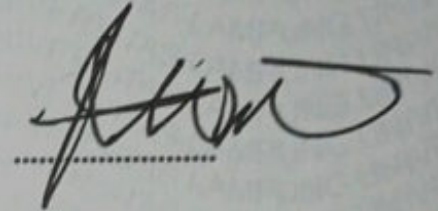
The Chairperson of Master
of English Education Study Program

Dr. Budi Kadaryanto, M.A.
NIP 19810326 200501 1 002

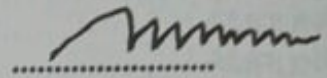
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1. Examination Committee

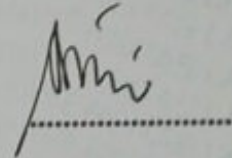
Chairperson : Prof. Dr. Flora, M.Pd.



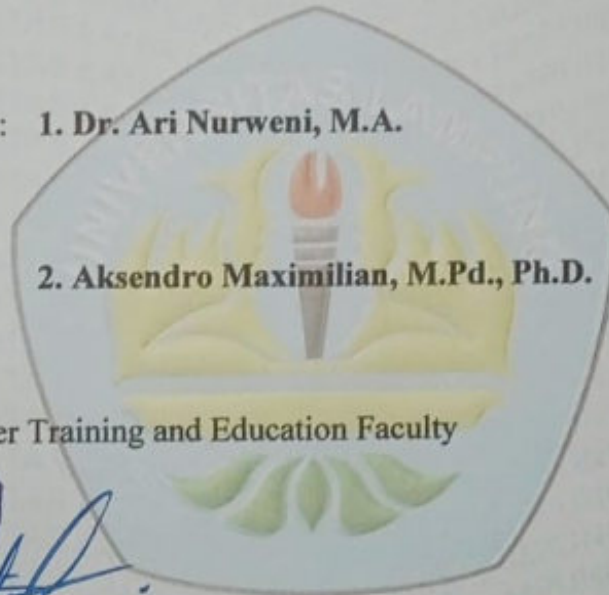
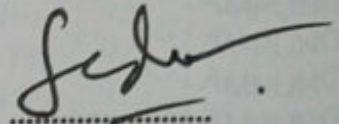
Secretary : Prof. Dr. Muhammad Sukirlan, M.A.



Examiner : 1. Dr. Ari Nurweni, M.A.



2. Aksenro Maximilian, M.Pd., Ph.D.



Dean of Teacher Training and Education Faculty



Dr. Albet Maydiantoro, M.Pd.
NIP 19870504 201404 1 001

3. Director of Postgraduate Program



Prof. Dr. Ir. Murhadi, M.Si.
NIP 19640326 198902 1 001

4. Graduated on: May, 7th 2026

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Purnama Hanan Murod
NPM. 2323042011

CURRICULUM VITAE

The writer was born in Bandar Lampung, Lampung, on October 28th, 1995, as the first child of Nurudin and Kasmi. He completed his primary education at SDN 3 Wiralaga 1 Mesuji in 2006. Then, he continued his junior secondary education at MTs Darussalam Wiralaga Mesuji and graduated in 2009. His senior secondary education was completed at Al-Mujtama' Al-Islami Boarding School Lampung Selatan in 2012. He obtained a Bachelor's degree in English Education from the State Islamic University of Raden Intan Lampung in 2020.

In 2016, he participated in the Community Service Program in Rama Indra Village, Lampung Tengah. In 2017, he completed his Teaching Practice at Perintis 1 Senior High School, Bandar Lampung. In 2018, he worked as an English private tutor and Al-Qur'an reciting tutor for elementary and junior high school students. From 2018 to 2019, he worked as a freelance translator. Since 2022, he has been working in agricultural field, with his current job as a vegetable farmer in a hydroponic garden. In 2023, he continued his studies in the Master's Degree Program in English Education at the University of Lampung.

This thesis is dedicated to my beloved mother for her unwavering support.
In pursuing this study, I thank my family and friends for their continuous encouragement
throughout this academic journey.

MOTTO

“In a world without gold, we might have been a Hero”

(Edward Teach)

“Knowledge speaks; wisdom listens”

(Jimi Hendrix)

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Bandar Lampung, May 2026

The writer

Purnama Hanan Murod

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I. INTRODUCTION

This chapter delves into the crucial aspects of the research, underscoring the expected product of development, identification of the questions, objectives, uses of the research, scope of the research, and definition of terms. The contents of the chapter are provided briefly below, emphasizing the significance of the research in the field of language education.

1.1. Background

Developing strong listening skills is essential for mastering a language. It has been proven that newborn babies start to acquire a language by listening to the sounds around them before they begin speaking or learning to read and write. This skill is vital for absorbing education and information, understanding the world and human interactions, and developing values. Consequently, listening plays a pivotal role in language development. This is evidenced by the fact that the majority of communicative time (56.2%) is dedicated to receptive skills, followed by 30.6% for interactive and 13.2% for expressive communication (Emanuel *et al.*, 2008). These figures underscore the significance of listening in overall language proficiency. Traditionally, listening has been taught simultaneously with all four language skills, which has limited learning time due to integrating all four language skills and using varied practice methods that are influential for real-life interactions.

Listening plays an essential role in communication in people's daily lives. People need good listening skills to understand each other, so good communication must be produced. Guo and Wills (2006) state that listening is the medium through which people gain a large proportion of their education, information, understanding of the world and human affairs, ideas, and sense of values. Thus, communicating effectively is impossible if students do not have efficient listening skills, especially in transactional interactions.

To effectively communicate, students require a skill to receive what others deliver in a conversation; therefore, listening is categorized as a receptive skill. However,

it is often mistakenly seen as passive when, in fact, listening demands active participation from the listener. It is important to note that hearing is the physical act of perceiving sound while listening is the active process of making sense of what we hear. Nunan (2003) states that listening is an active, purposeful process of making sense of what we hear. The raw elements of words, their arrangement, and the inflexions in the speaker's voice to derive meaning from them are processed to comprehend the sounds in hearing. Thus, listening is an active process in which the receiver's responsibility is to assume the meaning, much more than just a matter of hearing. It is necessary to pay attention to the sounds and give interpretations and meaning to them. By studying listening, people can improve their ability in English so they can respond after listening to the speaker, which means communication.

Emphasizing the importance of listening in language learning, learners can build an awareness of the interworking of language systems at various levels through listening and thus establish a base for more fluent, productive skill (Mart, 2020). Learners often internalize the idea that production equals knowledge. This perception dictates their study habits and, unfortunately, prioritizing output over input can negatively influence a learner's overall acquisition and achievement.

However, teaching and learning listening has been a continuing challenge for many English as a Foreign Language (EFL) instructors, particularly in Indonesian contexts. Students often struggle with multiple listening dimensions including understanding main ideas, recognizing details, making inferences, following sequences, and comprehending vocabulary in real-time (Jaya *et al.*, 2021; Saraswaty, 2018; Sari and Fithriyana, 2019). Various factors contribute to these difficulties including limited exposure to authentic English input, anxiety about not understanding every word, and insufficient opportunities for meaningful practice.

Students tend to find it difficult to listen well in the classroom; this could be due to various factors; sometimes, they feel bored and not interested or even less motivated in the lesson (Nabiyev and Idiyev, 2022). Teaching methods and techniques that are unsuitable for students could cause these problems. As a result, they may lose enthusiasm for learning English and even develop negative perceptions, especially

in listening comprehension. Students need techniques to increase their listening ability, become familiar with some words, and understand what someone says.

Dictogloss emerges as a promising technique that can significantly enhance listening skills. It is a classroom dictation activity where learners listen to a passage, write down keywords, and then work together to create a reconstructed text version. This technique has the potential to make students interact in class (Vasiljevic, 2010). Dictogloss, in terms of objectives and fostering a positive learning environment and procedures, is different from dictation; students need to listen to a passage, note down a keyword or phrase, and then encourage comparison. Based on this statement, dictogloss is very helpful in listening to and monitoring students both in and outside the classroom. Furthermore, dictogloss activities are a valuable way of presenting new factual information to students, encouraging them to listen for key points and understand the listening.

Dictogloss has proven to be a tool that has helped teachers motivate many students to engage in the learning process, often entirely in English, and enjoy working collaboratively to complete a task. Herrell and Jordan (2008) point out that cooperative play and tasks also promote their ability to work as part of a group, where they learn to listen. Moreover, a dictogloss activity requires students to utilise the four language skills while focusing on form. Most students seem to feel a sense of accomplishment and perceive that their English skills have improved as a direct result of the tasks.

To support statements before, the dictogloss technique has been the subject of some studies that have been done by some researchers, such as the study conducted by Puspita (2016) found that dictogloss can improve students' listening skills and provide a better atmosphere in the classroom. Further study was conducted by El-Esery (2016), emphasizing the benefit of dictogloss on different principles of language teaching, which include cooperation among learners, learner autonomy, curricular integration, focus on meaning, alternative assessment, diversity, thinking skills, and teachers as co-learners. During COVID-19 era, Said *et al.* (2023) were found that implementing the Dictogloss technique in the teaching-learning process increased the students' confidence in completing their tasks.

Based on the findings, dictogloss has many advantages in improving listening comprehension, including the dictogloss technique, which can provide a better atmosphere in the classroom. However, this technique often fails to promote students' involvement in classroom activities, which means that this technique often fails to promote student-centered learning activities. Previous research suggested that students should be actively involved in the learning process using this technique; students could quickly feel bored and reduce their motivation due to their less involvement in classroom activity (Rahmi, 2018; Said *et al.*, 2023; Thi *et al.*, 2021). As a result, implementing this technique in teaching listening comprehension, especially in learning transactional interaction, becomes troublesome for teachers; besides enhancing students' listening comprehension, teachers are encouraged to retain students' motivation and reduce their boredom by involving them as much as possible in classroom activities.

To overcome these problems, student-centered activity is considered one of the best strategies. Inquiry-Based Learning is a strategy that strongly promotes student-centered activity in the classroom. In this strategy, the teacher is a facilitator to support the learning process. This means that the teaching and learning process moves on to student-centered learning. Besides, learners have a particular style or strategy to study; each student has a different way of getting the experience of studying in class. An English teacher must cover all students' learning styles in the teaching-learning process. Although they have different styles and strategies, teachers must use appropriate teaching methods. The most critical aspect of enhancing students' skills is growing their curiosity. Inquiry-based learning is one framework that can increase students' curiosity. Exline (2005) explains that inquiry implies "a need or want to know" premise. Students find the solution to the problem rather than just finding the correct answer to the questions.

Initially, the inquiry-based method was intended for science and math classes but could also be adapted for teaching English (Lee, 2014). English language learners also need scientific principles, which are crucial in promoting systematic and logical ways. These skills will help them properly analyze the learning problems and find the solutions. Studies have revealed that inquiry-based instruction is suggested as a means to improve student's critical thinking skills

because the strategy enhances students' interpretation, analysis, evaluation, inference, explanation, and self-regulation skills, which are the core critical thinking skills (David and Nsengimana, 2022; Wale and Bishaw, 2020). In line with that finding, another study discovered that inquiry-based learning encourages students to be active and cooperative (David and Nsengimana, 2022; Lee, 2014; Ulker and Ali, 2023). In short, active students need cooperation with their friends to solve the problems they find from evidence and become inquirers.

In order to support the aim of inquiry-based learning, some activities may be implemented to maximize its effectiveness. Friesen and Scott (2013) propose some of those activities: scaffolding, formative assessment, powerful, critical, and essential questions, and through-line questioning. There are also four principles in the guidelines above for classroom practice: 1) Learning activities should focus on using processing skills. 2) Putting the learners at the center of an active learning process. 3) The positioning teacher is a facilitator of the learning process. 4) Assessment is ongoing. Accordingly, incorporating these principles with dictogloss activities is assumed to improve listening comprehension skills and encourage students to be more involved in classroom activities.

In contrast to the student-centered learning environment, studies reveal multiple challenges faced by teachers in preparing materials due to lack of provided textbooks or modules, lack of appropriate media or listening laboratories, difficulties matching listening materials to the curriculum and national exams, and environmental and technical issues like noise or power outages. Teachers also struggle with selecting appropriate methods and strategies for teaching listening and suffer from a shortage of authentic, level-appropriate listening materials that fit their specific classroom needs (Jamila and Rahman, 2024; Susilowati, 2021).

Moreover, another recent investigation found that teachers often face challenges designing and selecting audio materials that match students' diverse listening abilities. The scarcity of high-quality, authentic audio materials and difficulty finding or creating customized texts that target relevant vocabulary, grammar, or topics exacerbate these challenges, leading to the need for innovative solutions like synthetic audio (Wulandari *et al.*, 2025). This move towards customizable

technology is theoretically supported by Krashen's Input Hypothesis, which posits that language acquisition occurs optimally when learners receive 'comprehensible input' that is slightly beyond their current level of competence (Krashen, 1985).

Therefore, utilizing some technological advancement in ELT are considered to be needed, teachers could freely produce the most suitable text to their classroom, one such advancement is the increasing sophistication of Synthetic or Artificial Intelligence (AI)-generated voice technology. Through this advancement and the incorporation of IBL with the dictogloss technique, it is assumed that the teaching and learning activity could guide students to practice and get a deeper understanding of a text or a passage by involving them more in activities rather than only reconstructing what they had understood in written or reconstructed form. Teachers could create a text that fit to their students' ability. As a result, students could focus on measuring their listening comprehension skills by enhancing their curiosity, reduce students' boredom due to the difficulty level of a text and retain their motivation, positively impacting language learning outcomes.

Initially, this recent study was about improving students' listening comprehension skills by developing Dictogloss procedures and incorporating them with an IBL. In this research, the "a need or want to know" premise of IBL would be developed as one of the procedures of the Dictogloss teaching technique. Thus, this research focuses on incorporating inquiry-based learning with the dictogloss technique to enhance students' listening comprehension, especially in the form of transactional interaction. An investigation regarding students' perceptions of incorporating IBL with the dictogloss technique also be conducted to deepen the results of this research. However, the effectiveness of such tools is significantly mediated by how students perceive them. Furthermore, the landscape of ELT is continually evolving with technological advancements. As synthetic voices become more natural and capable of delivering educational content, their potential use in ELT listening passages warrants investigation. Understanding student perceptions of synthetic voice-overs as primary listening texts is crucial for their appropriate and beneficial integration into language learning. Therefore, this research also extends to an investigation of students' perceptions toward this emerging technology in the context of English listening passages.

1.2. Research Questions

The research questions on this research are:

- 1.2.1. Is there any significant difference in students' listening comprehension after the students have been taught by using the incorporation of IBL with the Dictogloss Technique?
- 1.2.2. Which aspect of listening is statistically affected the most after the students have been taught by using the incorporation of IBL with the Dictogloss Technique?
- 1.2.3. What are students' perceptions toward the implementation of incorporating IBL with the Dictogloss Technique?
- 1.2.4. What are students' perceptions toward synthetic voices in teaching and learning listening activity?

1.3. Objectives

Concerning the research questions above, the objectives of this research are determined as follows:

- 1.3.1. To know the significant difference in students' listening comprehension after the students have been taught by using the incorporation of IBL with the Dictogloss Technique.
- 1.3.2. To find out the aspect of listening which is statistically affected the most after the students have been taught by using the incorporation of IBL with the Dictogloss Technique.
- 1.3.3. To know students' perceptions toward the implementation of incorporating IBL with the Dictogloss Technique.
- 1.3.4. To know students' perceptions toward synthetic voice in teaching and learning listening activity.

1.4. Uses

1.4.1. Theoretically

The result of this research can be one of the references in learning theory of listening comprehension skill.

1.4.2. Practically

1) The students

The study's results can stimulate the student's ability to learn English, especially listening comprehension, and make the teaching-learning process fun.

2) The Teachers

The teachers can use the results of this study as reference and feedback to improve their teaching. Assumably, the learners will be more focused and understand how to listen using the developed dictogloss technique within the IBL framework, making the teacher's job easier.

3) The Readers

This study may inform the reader about how to learn to listen and improve students' listening achievement in the teaching and learning process by developing the Procedures of the Dictogloss Technique.

4) The Writers

The study's results can be used as a reference in conducting further research on teachers' activities in supporting student learning. This research is expected to anchor future researchers to give more attention to improving listening skills.

1.5. Scope

The scope of the study is limited to ensure detail and focus to avoid misunderstanding. The study focuses on incorporating IBL with the Dictogloss Technique to enhance students' listening comprehension, especially in transactional interaction text and improving its aspects. This leads to the investigation of students' perceptions of its implementation and the utilization of synthetic voice as listening passages in learning activity and listening test.

1.6. Definition of Terms

1.6.1. Teaching

Teaching is attending to people's needs, experiences and feelings and intervening so that they learn particular things and go beyond the given.

1.6.2. Learning

Learning is about change: developing a new skill, understanding a scientific law, and changing an attitude. The change in learning is relatively permanent, usually brought about intentionally.

1.6.3. Listening Comprehension

Listening comprehension can be defined as an interactive process in which listeners are involved in constructing meaning. The listeners should comprehend the oral input through sound discrimination, previous knowledge, grammatical structures, stress and intonation, and other linguistic or non-linguistic clues.

1.6.4. Dictogloss Technique

Dictogloss is an integrated skills technique for learning a language in which students work together to reconstruct a version of text read to them. It is a relatively recent procedure in language teaching. Although it borrows a little from traditional dictation, it is pretty distinct from dictation in both procedure and objectives.

1.6.5. Inquiry-Based Learning (IBL)

Inquiry-based Learning is the process of seeking truth, information, or knowledge by questioning.

1.6.6. Synthetic Voice

Synthetic Voice is artificially generated human speech created by computers (AI-Generated Voice Over). In this research, passages used as listening material in learning activity and listening test was created by using android-based application named Text To Speech (TTS) as a tool to voice over the passages.

1.6.7. Perception

Perception is how people use sensory information to perceive certain phenomena through awareness, past experience, knowledge, motivation and social interaction.

II. LITERATURE REVIEW

This chapter explores some main sub-chapters necessary for this research: a review of related literature, theoretical assumptions, and hypotheses.

2.1. Concept of Listening

Listening is fundamentally defined as an active cognitive process that necessitates direct participation and engagement from the receiver. Rost (2011) states that in the context of language pedagogy, listening is defined as a multifaceted cognitive process essential for comprehending oral discourse. This perspective emphasizes the active agency of the listener, who must mentally assimilate the input. To successfully derive meaning, the listener must simultaneously process various linguistic elements, including the speaker's phonology (accent and pronunciation), syntax (grammar), lexicon (vocabulary) and comprehension of meaning.

Auditory input is a prerequisite for oral output that refers to how people extract meaning from the discourse they hear (Harmer, 1999). Moreover, listening is not a one-way street because it is not the unidirectional receiving of audible symbols. However, the first step of listening comprehension is a psychomotor process of receiving sound through the ear and transmitting nerve impulses to the brain (Brown, 2006). It means that listening is an activity that actively takes process inside the brain. As stated above, listening is a way for people to get the audible information.

Listening can be defined as the ability to pay attention or to hear something. Otherwise, listening is not the same as hearing. Hearing is essentially an automatic, passive activity. It is possible to hear sounds without consciously engaging in the process. Meanwhile, the brain does not automatically translate the words into the message they convey in listening. Listening determines the meaning and message of the sounds or words. It is an active process that involves much more than assigning labels to sounds or words. As mentioned by Nunan (2014) "Listening is

an active, purposeful process of making sense of what we hear.” Consequently, the necessity of interpreting auditory input establishes listening as a fundamentally active competence.

As defined by Oxford (1993), listening is a complex problem-solving skill, and it is more than just the perception of sounds. Listening includes comprehension of fundamental language skills. It is a medium through which children, young people, and adults gain much of their information, understanding of the world and human affairs, ideals, values, and appreciation. Furthermore, listening skills are the cognitive processes that enable a learner to decipher specific messages and analyze the components of speech. Beyond simple comprehension, these skills facilitate active participation within society. Consequently, it is vital to account for the specific verbal norms established by the surrounding culture. To support this, educational communities must implement training processes that cultivate active listeners, thereby ensuring their success and standing within the academic environment.

Inferentially, listening is the capacity to identify and comprehend spoken discourse. It is a complex, multifaceted activity that transcends the mere physiological act of hearing. Instead, it is an active process comprising various cognitive stages aimed at deciphering the meaning and message behind the sound. In an educational context, this comprehension can be significantly enhanced by activating the students' prior knowledge.

2.2. Types of Listening

Listening is an essential skill in English language acquisition. It is essential for students to cultivate their listening abilities, a skill set that can be divided into three distinct types (Nation and Newton, 2009):

1) Discrimination

Students should be able to differentiate between words with similar sounds, such as seat and sit or beat and bit. Students with good knowledge of structure and vocabulary will be able to discriminate troublesome phonemes.

2) Retention

The students who give a particular meaning to the word increase the student's retention span.

3) Comprehension

The main object of listening comprehension is to make sense of the words and sentences. The degree of comprehension will depend on the listener's ability to discriminate phonemes, understand stress and intonation patterns, and retain what they have heard.

In this research, the study concentrates on comprehension listening, that is, understanding the information they hear, especially in the form of transactional interaction text. Unlike interpersonal texts, which primarily serve to maintain social relationships, transactional texts are purposefully designed to exchange concrete information, solve problems, or achieve specific communicative goals. Focusing on this genre ensures that the listening skills being measured are directly applicable to authentic, real-world scenarios where factual accuracy is paramount.

2.3. Aspects of Listening

Listening is a very complex process, emphasizing the listener's understanding of the meaning of the spoken texts. It involves both linguistic knowledge and non-linguistic knowledge. Rost (2011) describes linguistic knowledge as follows:

1. Speech sounds

Sound perception is the basis of hearing and an essential process in listening. Listeners recognize speech as a sequence of phonemes particular to a specific language.

2. Words

Recognizing words is the essential semantic process in listening. To recognize a word, listeners have to perform three simultaneous processes: find the most probable 'candidate word' among several possibilities, estimate the best meaning of the word in the context, and find the reference for the speaker's words.

3. Parsing speech

One of the essential processes in listening is parsing. It is dividing the incoming speech string into grammatical categories and relationships. Listeners parse speech by calculating the relationship of words and groups of words to a central theme or verb.

4. Discourse processing

It refers to the reasoning processes that enable the listeners to understand how language and context function together. In listening, the listeners try to identify relevant information. Often, they must infer missing information. They also form practical conclusions that include the relevant information and make sense of the cultural situation.

Furthermore, Buck (2001) stated that world knowledge is used not only to expand interpretation but also to restrict it. Non-linguistic aspects in listening related to world knowledge are inferencing and schema; inferences are classified into three types: (1). Propositional inferences, (2) Enabling inferences, and (3) Pragmatic inferences. The use of schemas for understanding is significant. Schemas are culture, specific patterns, of background knowledge that enable listeners to imagine the detailed form of description or social conversation (Rost, 2011). Schema is often called schemata.

Richards (1983) also provided a comprehensive taxonomy of aural skills, which he called micro-skills, involved in the conversational discourse level. And the macro-skills that focus on the sentence level:

Micro-skills;

1. Retain chunks of language of different lengths in short-term memory.
2. Discriminate among the distinctive sounds of English.
3. Recognize English stress patterns, words in stressed and unstressed positions, rhythmic structure, intonation contours, and their role in signaling information.
4. Recognize reduced forms of words.

5. Distinguish word boundaries, recognize the core of words, and interpret word order patterns and their significance.
6. Process speech at different rates of delivery.
7. Process speech containing pauses, errors, corrections, and other performance variables.
8. Recognize grammatical word classes (nouns, verbs, *etc.*), systems (*e.g.*, tense, agreement, pluralize), patterns, rules, and elliptical forms.
9. Detects sentence constituents and distinguishes between major and minor constituents.
10. Recognize that a particular meaning may be expressed in different grammatical forms.

Macro-skills;

1. Recognize cohesive devices in spoken discourse.
2. Recognize the communicative functions of utterances according to situations, participants, and goals.
3. Infer situations, participants, goals using real-world knowledge.
4. From events, ideas, *etc.*, describe, predict outcomes, infer links and connections between events, reduce causes and effects, detect such relations as main idea, supporting idea and new information, and give generalization and exemplification.
5. Distinguish between literal and implied meanings.
6. Disc decipher meanings using facial, kinesthetic, body language, and other nonverbal clues.
7. Develop and use a battery of listening strategies, such as detecting keywords, guessing the meaning of words from context, appealing for help, and signaling comprehension or lack thereof.

In line with previous statements, Heaton (1988) emphasizes the multifaceted nature of listening comprehension, including the cognitive and linguistic skills required to effectively understand spoken language. Listening comprehension involves several key aspects, including understanding the main idea, detail recognition, inference, sequence recognition, vocabulary, and understanding the speaker's intentions.

Rather than being a passive receptive skill, listening demands active, real-time cognitive engagement. Because spoken language is transient, disappearing the moment it is uttered, learners must rapidly synthesize these sub-skills simultaneously under significant time pressure. Foundational elements, such as vocabulary mastery and detail recognition, allow the listener to decode the explicit phonological input. This baseline decoding must then be immediately integrated with higher-order processing, enabling the learner to map the chronological sequence of information and extract the overarching main idea. Furthermore, achieving true communicative competence requires the listener to move beyond the literal translation of words. By applying logical inference and evaluating the speaker's underlying intentions, listeners navigate the pragmatic dimensions of the discourse, successfully bridging the gap between what is explicitly stated and what is implicitly meant.

2.4. Concept of Listening Comprehension

According to Rost (2011), listening comprehension can be defined as a dynamic, interactive process in which the listener actively constructs meaning. This requires the synthesis of oral input with sound discrimination, prior knowledge, grammatical structures, and prosodic features like stress and intonation, and other linguistic or non-linguistic clues. The ultimate goal is to understand the main ideas and information within a speech. In a teaching context, using texts with known meaning is highly effective; allowing students to comprehend the information more effectively.

In order to comprehend a text through listening, Bingol *et al.* (2014) stated three strategies, which are:

1) Cognitive Strategy

Cognitive strategy is a problem-solving method that learners apply to deal with the learning activity and facilitate the learning of knowledge.

2) Metacognitive Strategy

In this strategy, students are aware when listening to the text. Learners learn how to plan, monitor, and evaluate the collected information from the listening part.

3) Socio-Affective Strategy

This strategy is used when listeners should cooperate with others to check their comprehension and reduce their apprehension.

Therefore, this current study combined metacognitive and socio-affective listening comprehension strategies. The purpose is for students to get a general idea and comprehend simple information cooperatively that is explicitly conveyed in a spoken passage.

The emphasis on cooperative comprehension in this study is grounded in Social Constructivism, specifically Vygotsky's Zone of Proximal Development (ZPD), which suggests that meaningful learning occurs in the gap between independent ability and what can be achieved with scaffolding. By requiring students to check their comprehension cooperatively, the study leverages the principles of a supportive peer environment to facilitate cognitive development (Vygotsky, 1978). Simultaneously, the strategic focus on grasping general ideas represents the practical application of Metacognitive. This framework supports the learner's ability to plan, monitor, and evaluate the information collected, ensuring that students are not just passive listeners but active agents who recognize and appreciate the strategies required for successful comprehension.

2.5. Teaching Listening

Brown (2001) states that teaching listening aims to produce good listeners who construct reasonable interpretations based on specified input and recognize when specific information is required. In addition, the teacher must follow the stages of teaching and listening, assumed that the students would comprehend the texts.

Several models have been developed to explain how the listening process measures students' listening ability. According to Flowerdew and Miller (2005), those models are divided into three categories: bottom-up, top-down, and interactive.

1) Bottom-up model

The first listening model to be developed was the bottom-up model. According to this model, listeners build understanding by starting with the most minor units of the acoustic message: individual sounds or phonemes. These are then

combined into words, which, in turn, together make up phrases, clauses, and sentences. Finally, individual sentences combine to create ideas, concepts, and relationships between them.

2) Top-down model

Top-down models emphasize using previous knowledge in processing a text rather than relying upon individual sounds and words. The top-down model was developed when teachers considered that learners could not identify truncated sounds in isolation from the words. In contrast, learners can identify truncated words so long as they are presented with the surrounding context.

3) Interactive model

If listening involves bottom-up and top-down processing, some model synthesizing the two is required. This is the so-called interactive model.

The top-down model was mostly implemented in this study. The main focus is that students can understand and gain information from the texts they hear by using their background knowledge and some keywords they find in the text. Bottom-up and interactive models could help students to build their understanding, started from the smallest detail up to the largest.

To ensure this model remains active rather than passive, the study relies on the principles of Engagement Theory (Fredricks *et al.*, 2004). This framework explains that when instructional methods are integrated with sound pedagogy, they create intrinsically engaging and motivating activities. Engagement Theory identifies three interdependent dimensions crucial for this study: behavioral engagement (observable participation), cognitive engagement (mental effort), and emotional engagement (interest and enjoyment). By utilizing an interactive model where students must use background knowledge and keywords, the study fosters cognitive engagement, while the collaborative aspect of the method supports emotional engagement.

2.6. Concept of Dictogloss Technique

Jacobs and Small (2003) gave their opinion about dictogloss, “It is an integrated skills technique in learning a language in which students work together to

reconstruct a version of text read to them by their teacher.” This means that dictogloss is a language teaching technique that integrates listening, speaking, reading, and writing. The present research employs the dictogloss technique to improve listening comprehension.

Etymologically, dictogloss is a portmanteau formed by combining dictation with gloss, the latter referring to the act of interpretation. So, this technique combines two terms: dictation and interpretation. Wajnryb (1990) said, “Dictogloss is a relatively recent procedure in language teaching. It borrows a little from traditional dictation (hence part of its name). However, it is quite distinct from dictation in both procedure and objectives.” Moreover, Wajnryb states that in dictogloss, a short text is read at average speed to a class of learners who jot down familiar words as they listen. At the end of the dictation stage, most learners have only a small number of isolated words (or fragments), which make up a very cohesive, battered text. In small groups, the students then pool their resources to reconstruct their version of the original text. In the final stage, the various versions the students have produced are subjected to close analysis and comparison. Thus, the dictogloss technique is highly beneficial for developing listening proficiency, while also serving as a tool to monitor student performance both inside and outside the classroom. The procedure involves learners listening to a passage, recording essential keywords or phrases, and subsequently engaging in a comparative analysis of their notes.

Wajnryb (1990) posits that dictogloss boosts motivation by changing the traditional dynamic. rather than the teacher selecting grammatical features for isolated practice, the students discover their own errors during the reconstruction process. Consequently, teaching becomes reactive to student needs rather than proactive and prescriptive. Furthermore, Harmer (2007) characterizes dictogloss as a reconstructive activity. Unlike traditional dictation, the oral input is delivered at a natural or rapid pace. Students act to transcribe the content and subsequently compare their versions with the original text to identify linguistic discrepancies.

Synthesizing the definitions provided, dictogloss is best understood as a collaborative reconstruction task: the instructor reads a text, and students utilize brief notes to rebuild it in groups. The method is intentionally designed with

linguistic problems to heighten cognitive processing and foster peer interaction. However, a methodological challenge arises from its dual emphasis on listening and writing. To accurately measure listening comprehension in isolation, the technique must be customized and integrated with other concepts to narrow its focus.

2.6.1. Procedure of Dictogloss Technique

Dictogloss activities are a valuable way of presenting new factual information to students, encouraging them to listen for key points and understand the listening. Therefore, the procedures or stages are required to make this technique successful. Many variations and adaptations of the dictogloss technique have developed, but the main stages are usually the same. Based on Wajnryb (1990), four stages in the dictogloss procedure are:

1. Preparation: when the learners learn about the topic and do some preparatory vocabulary work.
2. Dictation: When the learners listen to the text, the teacher reads it at an average speed and takes fragmentary notes. The learners will typically hear the text twice. The first time the teacher reads the text, the students listen but do not write. The second time, the students take notes.
3. Reconstruction: when the learners work together in small groups to reconstruct a version of the text from their shared resources.
4. Analysis and Correction: Students analyse and compare their text with the reconstructions of other students and the original text, making the necessary corrections.

2.6.2. Advantages and Disadvantages of Dictogloss Technique

The dictogloss model offers several potential advantages over other models of teaching listening comprehension (Vasiljevic, 2010), they are:

- a. Dictogloss is an effective way of combining individual and group activities.
- b. Dictogloss procedure facilitates the development of the learner's communicative competence.
- c. The reconstruction stage helps students try out their hypotheses and identify their strengths and weaknesses.

- d. Working in small groups reduces learners' anxiety since they have to perform only in front of "a small audience."

Even though there are advantages, this technique also has some disadvantages:

- a. Dictogloss gives short-term memory, not long-term memory.
- b. Dictogloss in listening class is too focused on reconstructing the text while ignoring the reflection of what they learn from the text.
- c. There is no follow-up after students reconstructed the text.

Although there are advantages to applying the Dictogloss technique inside the classroom, the technique also has crucial disadvantages. Incorporating the dictogloss technique within the IBL framework is expected to address these disadvantages.

2.6.3. Previous Studies in Teaching Listening Through Dictogloss Technique

There have been studies on the dictogloss technique to improve student's listening comprehension. The first study conducted by Puspita (2016) under the title "Enhancing Students' Listening Skill through Dictogloss," was done at the English Department of UIN Raden Intan, found that dictogloss can improve students' listening skill. Not only did she improve students' listening skills, but she also found that the dictogloss technique could provide a better atmosphere in the classroom.

Another study also conducted by El-Esery (2016) He studied "Dictogloss-Based Activities for Developing EFL Learners' Listening Comprehension." He found that Dictogloss embodies the different principles of language teaching, which include cooperation among learners, learner autonomy, curricular integration, focus on meaning, alternative assessment, diversity, thinking skills, and teachers as co-learners.

Further study has been conducted during the covid-19 era by Said *et al.* (2023), they found out that Dictogloss Technique is one of the good ways to improve the student's listening ability. They indicated that this method has succeeded in improving the student's listening ability. After implementing the Dictogloss technique in the teaching-learning process, students could be more impassioned and confident in doing their tasks. The result also showed that the method could increase

the student' teamwork through group discussion, widen their vocabularies, and improve their pronunciation.

However, this technique often fails to promote students' involvement in classroom activities, which means that this technique often fails to promote student-centred learning activities. Research by Rahmi (2018) suggests that students should be actively involved in the learning process using this technique; this could reduce their motivation due to their less involvement in classroom activities. As a result, implementing this technique in teaching listening comprehension becomes troublesome for teachers; besides having to enhance students' listening comprehension skills, teachers are encouraged to retain students' motivation and reduce their boredom by involving them as much as possible in the classroom activity.

In line with Rahmi's study, Thi *et al.* (2021) also found a similar anomaly where Dictogloss in the listening lesson may lead to students' boredom and reduced motivation. Various, sensitive and flexible uses of different techniques could help reduce one technique's limitations and boost one's strengths. As a result, these studies provide useful insights while emphasizing the ongoing commitment to innovative methodologies in language education.

2.7. Concept of Inquiry-Based Learning

Responding to drawbacks provided previous chapter and the demands of listening comprehension, inquiry-based learning came to allow students to gain knowledge through active discovery. Although the focus is on the student, the teacher remains a crucial guide in ensuring the process is productive. Citing Alberta (2004), this process involves students actively formulating questions and conducting extensive investigations to construct new meaning. The resulting knowledge is then applied to address specific inquiries, design solutions, or substantiate a particular viewpoint.

Essentially, inquiry-based learning puts the responsibility on the student to ask questions, investigate, and build their own understanding. Because they are the architects of this knowledge, the method strictly requires them to think critically throughout the process. The following are some points of IBL that benefit Dictogloss for use in listening comprehension:

1) Utilizing the Benefits of Inquiry-Based Learning

The benefits of inquiry-based learning for students are as follows:

- a. Learning becomes livelier and can make students active.
- b. Can form and develop basic concepts for students.
- c. Encourage students to think and work on their own initiative.
- d. Avoiding teacher-centered learning methods.
- e. Allows students to learn by making use of various types of learning resources.

2) Characteristics of Classrooms Using Inquiry-Based Learning

Classrooms that are taught using inquiry-based learning have the following characteristics (Alberta, 2004):

- a. The inquiry capitalizes on student curiosity.
- b. Data and information are actively used, interpreted, refined, digested, and discussed.
- c. Teachers, students, and teacher-librarians collaborate.
- d. The teacher uses the language of inquiry on an ongoing basis.
- e. The teacher facilitates the process of gathering and presenting the information.
- f. The teacher and students use technology to advance the inquiry.
- g. The teacher embraces inquiry as both content and pedagogy.
- h. The teacher and students interact more frequently and more actively than during traditional teaching

Thus, by incorporating the Dictogloss technique with IBL, it is expected that students could focus on comprehending a text due to its benefit, which allows students to actively use, interpret, refine, and discuss the data or information. This could help students to focus on one skill by directly practicing what they have learned.

2.7.1. Procedures of Inquiry-Based Learning in TEFL

Inquiry-based teaching involves some steps which relate to 5E: engagement, exploration, explanation, elaboration and evaluation (Bybee *et al.*, 2006).

- 1) The first step in inquiry-based teaching is engagement. In this step, the teacher opens the students' prior knowledge and assists them in engaging a new concept by the role of short movements which stimulate curiosity and obtain knowledge priority
- 2) The second stage is exploration. Exploration skills deliver students with a common basis of movements of the current concepts inside (i.e. misconceptions), procedures, skills and conceptual change is enabled.
- 3) The third step is explanation. Here, the students are given a chance to introduce their understanding of the concept. An enlightenment from the teacher or the course may lead them toward a deeper understanding which becomes a crucial part of this stage.
- 4) The next step is elaboration. Teachers challenge and expand students' conceptual understanding and skills.
- 5) The last stage, called evaluation, helps students gauge their understanding and abilities and gives opportunities for teachers to assess the progress of the students in reaching the educational objectives

2.7.2. Previous Studies in Inquiry-Based Learning

Studies have been conducted on the use of inquiry-based learning in the context of language learning. A study conducted by Wale and Bishaw (2020) as they examine the effects of using inquiry-based learning on students' critical thinking skills. They found that inquiry-based instruction is suggested as a means to improve students' critical thinking skills because the strategy enhances students' interpretation, analysis, evaluation, inference, explanation, and self-regulation skills, which are the core critical thinking skills. This is because using inquiry-based learning in writing classes promotes students' academic performance and makes students active, problem-solving solvers, autonomous, and lifelong learners.

In line with that finding, another study conducted by David and Nsengimana (2022), they contend that inquiry-based learning makes it possible to be inquirers where they are encouraged to explore new ideas and understandings through personal

discoveries and explorations as well as interactions with objects and with other people. As a result, inquiry-based learning encourages students to be active and cooperative. Students who are active need cooperation with their friends to solve the problems they find from evidence and become inquirers.

The studies collectively demonstrate the effectiveness of the Inquiry-Based Learning in improving language learning. The critical activities in IBL not only provide different learning needs, but also actively engage students and promote improved communication abilities. The positive findings from various studies highlight the importance of IBL in language education, particularly in improving listening comprehension and creating a more interactive and communicative classroom environment.

2.8. Incorporating IBL with Dictogloss Technique

In teaching listening comprehension, IBL could be a useful technique to incorporate with the Dictogloss technique. Students are able to actively engage with the material, ask questions, and seek answers, which can enhance their listening skills and comprehension. Based on the explanation of the dictogloss technique and the concept of Inquiry-Based Learning, teaching procedures are formulated as follows:

No.	Learning Activities of Dictogloss Technique (Wajnryb, 1990)	No.	Learning Activities of Incorporation of IBL with Dictogloss Technique
1.	Preparation: Learners find out about the topic from the audio provided and do some preparatory vocabulary work.	1.	Engagement: Introduce the topic with a brief discussion, video, or recorded passage to engage students and encourage inquiry. Provide a related listening material, such as an interview, podcast, or news report, so they can gather relevant information. Teachers guide them in preparatory vocabulary work to enhance understanding.
2.	Dictation: The learners listen to the text from an audio speaker; they will typically hear the text twice. The first time the teacher plays the audio; the students just listen but do not write. The second time, the students take notes.	2.	Dictation: Have students listen to the material for the first time without taking notes. This initial listening is for overall comprehension and to get a sense of the content. After the first listening, divide the class into groups. Encourage them to note any new information they missed during the first listening.

No.	Learning Activities of Dictogloss Technique (Wajnryb, 1990)	No.	Learning Activities of Incorporation of IBL with Dictogloss Technique
3.	Reconstruction: When the learners work together in groups to reconstruct a version of the text from their shared resources.	3.	Exploration: When the learners work together in group to reconstruct a version of the text from their shared resources.
4.	Analysis and Correction: When students analyse and compare their text with the reconstructions of other students and the original text, they make the necessary corrections.	4.	Explanation: When students analyse and compare their text with the reconstructions of other students and the original text, they make the necessary corrections.
5.		5.	Elaboration: Encourage students to reflect on what they've learned, discuss any lingering questions or uncertainties, and propose further avenues of inquiry. This step is crucial for promoting critical thinking and inquiry-based learning.
6.		6.	Evaluation: Design follow-up activities that involve further exploration of the topic, such as group research, debates, projects, or presentations. This will allow students to deepen their understanding and apply and practice what they've learned.

Table 2.1. Procedure

Incorporating IBL with Dictogloss technique is not only improving listening comprehension but also fosters critical thinking, collaboration, and curiosity among students. It encourages them to actively participate in the learning process and take ownership of their education.

2.9. Synthetic Voice

The confluence of advancements in artificial intelligence and the evolving pedagogical landscape of English Language Teaching (ELT) has brought synthetic voice technology to the forefront of educational innovation. This technology, capable of producing synthetic speech that increasingly mimics human vocal

nuances, offers transformative potential for creating and delivering learning materials, particularly for listening comprehension.

synthetic voice, often referred to as synthetic speech, is created by artificial intelligence systems designed to replicate human-like vocal qualities over a wide range of applications (Tan *et al.*, 2021). These voices are produced using sophisticated algorithms that emulate the nuances of natural human speech, including characteristics such as tone, pitch, and cadence.

Technology Acceptance Model (TAM) posits that technology adoption is governed by perceived usefulness, the extent to which technology enhances learning, and perceived ease of use; the effort required to operate the technology (Davis, 1989). Looking ahead, by 2025, synthetic voice technology is anticipated to offer hyper-personalized interactions, adapting to individual user preferences and even mood, alongside multimodal interfaces that can process speech, text, images, and video simultaneously, and enhanced multilingual support. This is consistent with recent research indicating that, in educational contexts, perceived usefulness from pedagogically aligned design drives sustained technology acceptance, even when technical limitations exist.

Besides, Krashen's Input Hypothesis posits that language acquisition occurs when learners receive comprehensible input that is slightly beyond their current level of competence (Krashen, 1985). This framework is relevant as the perceived quality and intelligibility of synthetic voices can directly impact whether the auditory input is considered "comprehensible" and conducive to acquisition. The theory could confirm its suitability to use it as listening passages, whether using it in listening activity and as a main passage in a listening test. This advancement could support teachers to match the complexity of a passage with students' current ability.

While Vygotsky's (1978) Sociocultural Theory highlights the importance of social interaction in learning, with tools and more knowledgeable others (MKOs) scaffolding development. AI tools, including those delivering voice-overs, can be conceptualized as technological scaffolders. However, they inherently lack true social interaction. The "voice" of this AI scaffolder (its perceived naturalness, friendliness, or authority) could significantly influence how students engage with it

and whether they perceive it as a helpful MKO substitute or a mere mechanical device. Furthermore, Engagement Theory explains the very high motivational ratings, supporting that technology integrated with sound pedagogy creates intrinsically engaging and motivating activities (Kearsley and Shneiderman, 1998). Therefore, android based application named Text To Speech (TTS) is chosen due to its ease of use, as the user could freely adjust voice gender, accents, intonations and speed.

Previous researches have been indicating that integrating educational technology integrates with effective pedagogy (collaborative learning, student agency, meaningful engagement), student perception is substantially more positive than when technology is used for passive content delivery alone (Handley, 2009). However, this technological sophistication as the listening passages could not replace the figure of teacher entirely, as Arynova *et al.* (2023) found that students' perception of synthetic voice effectiveness depends on alignment with pedagogical goals, it accepted by students if only technology serves clear learning purposes (like promoting independent problem-solving) rather than to replace human teaching without pedagogical benefit.

The synergy of these perspectives substantiates the viability and necessity of synthetic voice technology, when appropriately designed, to optimize listening instruction and learner experience in contemporary English language pedagogy.

2.10. Perception of Students

According to Brown and Lee (2015), perception is defined as the ability to extract meaning from sensory experiences to direct adaptive behavior. It is a neurological event where sensory stimulation is transmitted to the brain, processed either consciously or subconsciously. Crucially, perception is inherently subjective; it is shaped by an individual's internal thoughts and unique viewpoint. In an educational context, this subjectivity is vital: the way students perceive a teacher's methodology and the media used in the classroom directly impacts their success in learning English. Therefore, grasping the nature of perception provides teachers with essential insights into student performance. Understanding this link allows teachers to analyze why certain instructional methods succeed or fail with specific students.

The perception is very bound to students and classroom activity; it can affect a learning outcome. As stated by Nunan (2004), students' perceptions of what constitutes legitimate classroom activity will influence learning goals and students' perceptions of what they should contribute to task completion, their opinions on the nature and demands of the task, and their definitions of the setting in which the task takes place will all influence outcomes. It is due to the perception itself, which is the act of interpreting a stimulus registered in the brain by one or more sense mechanisms, including self-awareness, knowledge, past experience, motivation and interaction with surroundings (Sperling, 1967). In student-centered methodologies, learners assume a more significant role in the educational process. This active involvement shapes their perception of the learning experience, which can subsequently stimulate and sustain their interest in language acquisition.

Fundamentally, the study of student perception aims to understand how learners organize and interpret sensory data to construct meaning within their educational environment. This cognitive process dictates how they recognize and respond to various learning cues. In practical terms, the nature of this perception is critical; a student's positive or negative view of the teacher's methodology directly correlates with, and impacts, the level of their academic achievement.

2.11. Theoretical Assumption

Students gain benefits in comprehending a text because incorporating IBL with Dictogloss Technique is more student-centered, frequently includes the development of practical linguistic skills and cognitive skills, and the sophistication of synthetic voice allows for more meaningful communication. Furthermore, responding to what they comprehend in the classroom benefit students by increasing their understanding of what they listen.

Based on the foregoing assumptions, incorporating IBL within Dictogloss Technique is assumed to be implemented along with its procedures and it is a good alternative for treating student's listening comprehension. It enables students to enhance their listening comprehension. As a result, it is reasonable to expect an increase in students' listening achievement.

The research additionally assumes that synthetic voice technology addresses documented material scarcity challenges in EFL contexts by enabling teachers to rapidly create customized, level-appropriate listening content to use in listening activity. This technological affordance removes a significant barrier to implementing communicative, authentic listening instruction, particularly in under-resourced Indonesian educational contexts where provided audio materials may not match student proficiency levels or curricular objectives.

2.12. Hypothesis

According to Setiyadi (2018), the hypothesis in a study is a statement about the distribution of variables or the relationship between two (or more) variables to be studied. He also defines that hypothesis as a tentative answer to the research question. The hypotheses of the research are:

1. There is a significant difference in students' listening comprehension after the students have been taught by using the incorporation of IBL with Dictogloss Technique.

This is the end of this chapter, the theories referring to the subject of this research can be understood after reading this literature review. The next chapter discusses about the methods that is used in collecting and analyzing the data in this research.

III. METHOD

This section covered all methodological aspects of the research. It addressed the design, sampling, and instrumentation, alongside the specific procedures used to collect and analyze the data to ensure the findings are both valid and reliable.

3.1. Design

This study employed a pre-experimental one-group pre-test and post-test design. This methodological approach was selected due to administrative constraints, specifically the inability to randomly reassign students from their pre-existing class structures. Furthermore, this design preserves ecological validity by allowing the intervention to occur within a natural classroom setting and is deemed appropriate for evaluating the preliminary efficacy of novel instructional strategies. Structurally, the design involves administering a pre-test to establish a baseline, followed by the treatment, and concluding with a post-test to measure the resulting changes (Setiyadi, 2018). The study utilizes a pre-test (T1) to gauge entry-level performance and a post-test (T2) to evaluate the impact of the treatment. Statistical indicators such as the mean, standard deviation, and t-score are calculated to verify the significance of the students' improvement in listening comprehension. The research design is presented below:

Research Design

T₁	X	T₂
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Note:

X: Treatment by using the Incorporation of the Dictogloss Technique with IBL

T₁ : Pre-test

T₂ : Post-test

Further study is conducted to figure out students' perceptions of the IBL-Dictogloss intervention as well as their perceptions of synthetic voice technology; the Likert Scale implemented within the questionnaire to collect the data.

3.2. Variables

The experimental design of this research involves two variables: an independent variable refers to the influence and a dependent variable which stands for the outcome. According to Freankel *et al.* (2011), an independent variable is defined as the specific factor selected to investigate its potential impact on other elements. It is the presumed cause or influencer within the study. Conversely, the dependent variable represents the outcome; it is the factor that changes or is affected in response to the independent variable.

- a. The independent variable of this research is the incorporation of IBL with the Dictogloss technique (X).
- b. The dependent variable of this research is students' Listening Comprehension (Y).

3.3. Population and Sample

A population is a group of individuals who have the share a common characteristic (Creswell and Creswell, 2018). The population to this research was the students in the second semester of the eleventh grade of MA N 1 Bandar Lampung in the academic year of 2024/2025.

Meanwhile, a sample represents the group of individuals from whom data is obtained (Freankel *et al.*, 2011). The sample of this research was one class, which, students have been taught by using the incorporation of IBL with Dictogloss technique. Purposive sampling was employed due to practical constraints. The school context, teacher availability, and administrative approval necessitated working with an existing class structure. This approach is appropriate for intervention studies where implementation quality is critical. The sample consisted of one intact class purposively selected from MA N 1 Bandar Lampung. The final sample included 30 student participants (n=30) from Grade XI.

3.4. Data Collecting Technique

In collecting the data, two instruments are employed, namely a listening test and a questionnaire. The steps of the data collection technique are as follows:

1. Pre-Test

Before the treatment phase began, a pre-test was conducted in the first session to measure the students' entry-level skills. This step was essential to determine their starting ability before being exposed to the IBL and Dictogloss technique. Structurally, the test consisted of 20 objective multiple-choice questions.

2. Post-Test

After the treatment, a post-test containing the same items as the pre-test was given. This step aimed to evaluate the effectiveness of the IBL and Dictogloss intervention by calculating the significant difference in students' listening performance between the two testing periods.

3. Questionnaires

The study employed a questionnaire to measure students' attitudes toward the instructional method and the use of synthetic speech. To mitigate any potential language barriers, the items were provided in both English and *Bahasa Indonesia*. The questionnaire utilized a 5-point Likert scale, where students were asked to rate their responses from 'Strongly Disagree' to 'Strongly Agree', thereby quantifying their qualitative perceptions.

3.5. Instrument

In the context of research methodology, an instrument is defined as the specific tool utilized to measure, observe, or document empirical data. Structurally, it comprises a set of pre-determined questions and standardized response categories that are rigorously developed prior to the commencement of the study (Creswell and Creswell, 2018). In this research, the listening multiple-choice pre-test and post-test were implemented as the instrument to collect the data to answer RQ1 and RQ2. Moreover, Likert Scale questionnaire would be the instrument to answer RQ3 and RQ4.

1. Listening Test

The instrument used to get the data was a listening test, which includes a pre-test and a post-test. In order to make data accurate, the Multiple-Choice

listening test applied in the pre-test and post-test. In this research, the students listened to the synthetic audio passages and chose the best available multiple-choice answer given to them. This test is aimed at knowing students' improvement in listening comprehension skills and the details of its aspect.

To make pre-test and post-test suitable for students, the test emphasizes both the cognitive and linguistic skills required to effectively understand spoken language. Heaton's (1988) framework was deliberately selected as the primary theoretical foundation for defining the construct of listening comprehension in this study due to its highly operational and measurable taxonomy of sub-skills.

However, for the specific scope and methodological parameters of this present study, the aspect of "understanding the speaker's intentions" was deliberately omitted from the assessment construct. This omission aligns with the pedagogical boundaries of the intervention itself. Wajnryb (1990), in establishing the framework for the Dictogloss technique, designed the method primarily to facilitate the collaborative reconstruction of informational content and linguistic form. Therefore, restricting the listening aspects to vocabulary, detail, sequence, main idea, and logical inference ensures that the assessment remains perfectly aligned with the structural and factual focus of the Dictogloss reconstruction process. The following is the table of specifications of the listening test:

No	Aspect	Details	Instrument
1	Understanding the Main Idea	Grasping the central theme or primary message of the spoken content.	1, 6, 11, 16, 21
2	Detail Recognition	Identifying specific pieces of information or details within the spoken material.	2, 7, 12, 17, 22
3	Inference	Making logical deductions or assumptions based on the information provided.	3, 8, 13, 18, 23
4	Sequence Recognition	Understanding the order of events or steps described	4, 9, 14, 19, 24
5	Vocabulary	Comprehending the meaning of words and phrases used in the spoken content.	5, 10, 15, 20, 25

Table 3.1. Table of Specification of Listening Test (Heaton, 1988)

2. Questionnaire

To answer the third research question, questionnaires that consist of 40 questions of perception adapted from the Student Perception of Research Integration Questionnaire (SPRIQ) (Visser-Wijnveen *et al.*, 2016), every question distributed from every aspect of perceptions (Sperling, 1967) to uncover students' perceptions toward the implementation of incorporating the IBL with the Dictogloss technique after the treatment. The following is the table of the questionnaire item numbers in order to ease the grid of questionnaire statements. The questionnaire item number can be seen below:

No.	Aspects	Indicator of student's perception	Item Number
1.	Awareness	To know the students' awareness about the use of incorporating IBL with the Dictogloss technique	1-6
2.	Past Experience	To know the students' experiences when the teacher use of incorporates IBL with the Dictogloss technique	7-12
3.	Knowledge	To know the students' knowledge after being taught by using the incorporation of IBL with the Dictogloss technique in learning.	13-18
4	Motivation	To know the students' perception about the motivation on their listening comprehension session after being taught by using the incorporation of IBL with the Dictogloss technique	19-24
5	Social Interaction	To know the students' social interaction when the teacher use of incorporates IBL with the Dictogloss technique	25-30

Table 3.2. Aspects of Technique Implementation Questionnaire

In addition, a second instrument was developed specifically to explore students' perceptions of synthetic voice technology in listening activities and listening test. This perception questionnaire measures students' views on aspects such as clarity, naturalness, understanding and engagement.

No.	Aspects	Indicator of Student's Perception	Item
1	Clarity	Directly assesses clarity and direction following	4
2	Naturalness	Reflects ease of processing and "natural" mental imagery formation	6
3	Comprehension	Measure ease of understanding and perceived knowledge gain	1, 5
4	Engagement/Motivation	Reference interest and motivation to learn more	7, 8
5	Overall Acceptance	Measure broader acceptance, self-driven exploration, and perceived richness of experience with synthetic voice	2, 3

Table 3.3. Aspects of Synthetic Voice Questionnaire

The table of specification and dimension choices for synthetic voice perception are adapted and conceptually validated from past studies on TTS (Text-to-Speech) systems and synthetic voice technology questionnaires (Davis, 1980; Handley, 2009). These frameworks commonly assess clarity, naturalness, comprehension, engagement/motivation, and overall student acceptance using Likert-scale methods.

3.6. Procedure

There are some steps in the research procedure for this research. They are:

1. Determining the subject of the research

The subject of this research is one group purposively from the tenth grade of MAN 1 Bandar Lampung, which consists of 35 students.

2. Constructing the incorporation of IBL with the Dictogloss technique for teaching

A teaching module using the incorporation of the IBL with Dictogloss technique and sophisticating synthetic voice to create spoken passages are constructed to applicate the activities into the classroom.

3. Trying-out the test

To ensure the quality of the data, a try-out was performed before the main study. This process aimed to verify the instrument's accuracy and effectiveness, while also confirming its suitability for administration.

4. Administering the Pre-Test

To ascertain the students' initial listening comprehension proficiency, a pre-test was conducted at the very beginning of the study before the intervention. The test comprised twenty valid questions designed in a multiple-choice format.

5. Conducting the treatment

The study spanned 3 meetings of 90 minutes each. The pre-test and post-test were conducted in the first and last meetings, respectively. The intervening three sessions constituted the treatment phase, where students engaged with transactional interaction texts on topics such as Holidays and Heart Health Care.

6. Administrating the Post-Test

After the treatment, a post-test consisting of the same questions as the pre-test was conducted. The results were analyzed using IBM SPSS statistics to verify the statistical significance of the students' achievement and to assess improvements regarding specific listening aspects.

7. Administering the Questionnaire

Following the conclusion of the intervention, a closed-ended questionnaire was administered to the participants. The primary objective of this instrument was to assess students' perceptions regarding two key variables: the implementation of

the IBL and Dictogloss technique throughout the treatment, and the sophistication of synthetic voices within the listening activities and assessments.

3.7. Validity Of the Instrument

Validity stands as the fundamental when developing research tools, serving as the cornerstone of credible instrument design (Creswell and Creswell, 2018). Fundamentally, an instrument is considered valid when it accurately measures the specific variables it intends to assess. To ensure the integrity of the instrument used in this study, three distinct types of validity were established: face, content, and construct validity. Face validity obtained from printing instructions and directions in the test. Content validity obtained by choosing the text based on the student's level and the curriculum. Construct validity achieved by focusing the test on getting the gist and reconstructing the test to show the students' skills.

1) Content Validity

According to Creswell and Creswell (2018), content validity refers to the degree to which the items contained in an instrument adequately represent the entire universe of possible questions regarding the specific content or skill set being measured. Content validity requires that the instrument is appropriate for both the subject matter and the specific skills being taught. Consequently, the test items were constructed directly from the syllabus and the learning materials used in the study, ensuring that the assessment accurately reflects the intended listening skills.

To ensure content validity, the following steps were undertaken:

- a) **Analysis of the Curriculum:** A detailed review of the 11th grade English curriculum under the 'Kurikulum Merdeka' was carried out to identify the core components of listening comprehension that the instrument should measure.
- b) **Selection of Appropriate Texts:** The transactional interaction texts included in the test were carefully chosen to reflect topics covered in the classroom. The researcher selected themes such as sport, holiday and social media for their relevance to the discussion texts genre.

- c) Assessment of Key Skills: Test questions were specifically designed to evaluate various aspects of listening comprehension, such as identifying main ideas, finding detailed information, understanding vocabulary in context, recognizing sequence of events, and making inferences.
- d) Expert Review: The test underwent careful review by a team of experienced English lecturers and teachers to ensure it adhered to curriculum standards and was appropriate for the target students' proficiency level (see Appendix 6).
- e) Pilot Testing: A pilot study was carried out with a sample of n=30 11th-grade students to identify potential issues related to question clarity, difficulty, and time allocation.
- f) Item Analysis: Following the pilot testing, each test item underwent analysis to assess its performance. This analysis evaluated the discrimination power of each item, determining how well they differentiated between high and low performers. Items that did not meet the established criteria were replaced to improve their quality.
- g) Instrument Development and Evaluation: In preparing the pre-test, 25 listening comprehension questions developed based on transactional interaction texts aligned with the Merdeka curriculum guidelines. These questions aimed to assess various listening skills, including identifying the main idea, locating specific information, understanding vocabulary in context, and making inferences or references. After administering the try-out test, the difficulty and discrimination power of the questions were analyzed in detail. Item validity in this study is assessed using item-total correlations (Pearson r) and significance testing. According to Cohen *et al.* (2007), items should demonstrate; statistically significant correlation with total test score ($p < 0.05$), adequate discrimination index ($r \geq 0.30$ minimum; $r \geq 0.50$ preferred), and alignment with overall construct measurement.

The validity of the try-out test items was analyzed using item-total correlation (R item) and compared against the R table value of 0.361 at a significance level of 0.05. Based on the analysis, all 25 items were found

to be statistically valid, as whether the *r*-items and the *p*-values exceeded their threshold. However, further evaluation using the Discrimination Index (DI), Difficulty Level (DL) and the result of the validation checklist led to the removal of five items (Q5, Q6, Q13, Q17, and Q24) due to suboptimal discrimination power, inappropriate difficulty levels (see appendix 8) and the insufficient time per section (see appendix 6). These items demonstrated the weakest item-total correlation within the Main Idea aspect, Vocabulary aspect, Inference aspect, Sequence and Detail Recognition aspect. Thus, in order to maintain comprehensive coverage of all five listening comprehension aspects as well as reducing test administration time for practical feasibility, 20 items were retained for the final instrument.

The retained items demonstrated moderate to excellent discrimination power and were categorized as easy to moderate in terms of difficulty. This indicates that the majority of the items were effective in distinguishing between high- and low-performing students, thereby supporting the construct validity of the instrument.

h) The final selection eliminated 5 items, with the following categorization:

Aspect	Item	Correlation (r)	P-value	Primary Reason
Main Idea	Q5	0.368	0.0436	Weakest in aspect; marks boundary of moderate validity
Vocabulary	Q6	0.471	0.0381	Lowest r + excessive difficulty (p=0.867)
Inference	Q13	0.427	0.0582	Invalid item (p>0.05); highest difficulty in aspect
Sequence Recognition	Q17	0.428	0.3972	Severely invalid; lowest correlation in entire test
Detail Recognition	Q24	0.473	0.0752	Marginal significance; weakest in aspect

Table 3.4. Eliminated Items

The finalized set of questions provided comprehensive coverage of all required aspects of listening comprehension. A detailed table outlining the categorization and question distribution is provided in further explanation.

2) Construct Validity

According to Creswell, construct validity is a determination of the significance, meaning, purpose, and use of scores from an instrument (Creswell and Creswell, 2018). Construct validity determines the test based on the theoretical, which measures listening comprehension.

No	Aspect of Listening Comprehension	Number of Items	Quantity	Percentage
1	Understanding the Main Idea	1, 6, 11, 16	4	20%
2	Detail Recognition	2, 7, 12, 17	4	20%
3	Inference	3, 8, 13, 18	4	20%
4	Sequence Recognition	4, 9, 14, 19	4	20%
5	Vocabulary	5, 10, 15, 20	4	20%
	Total	20		100%

Table 3.5. Item Distribution

Valid Items	Eliminated Items
20	5

Table 3.6. Valid Items

To confirm the construct validity, the test items were carefully developed to match the listening comprehension skills outlined in the curriculum (Brown, 2001). Each question was designed to reflect both the content and the thinking skills students were expected to show. The items were then reviewed by experienced English teachers, who provided feedback on how accurately they represented the intended constructs. In addition, a statistical analysis of the pilot test results was carried out to check whether each item effectively contributed to measuring students' overall listening comprehension.

3) Validity of the Questionnaires

Prior to the empirical testing, the perception questionnaires were rigorously evaluated to establish both content and construct validity. Content validity was achieved through expert judgment (see appendix 6), ensuring that the statements were clearly articulated, unambiguous, and directly relevant to the students' specific classroom experiences during the intervention. Construct

validity was established by systematically anchoring the questionnaire items to established theoretical frameworks. Specifically, the instrument evaluating the IBL-Dictogloss technique was mapped to psychological dimensions, while the instrument evaluating the synthetic voices was developed based on the Technology Acceptance Model (TAM) to measure perceived usefulness and ease of use.

Furthermore, statistical item validity (Pearson Product Moment) employed to analyze the validity of questionnaires by comparing r table with Pearson Correlation. The data was collected from a sample of 30 respondents ($N=30$). The significance of the correlation was tested at a 5% significance level (<0.05). For $N=30$, the critical value (r -table) is 0.361 (see appendix 9). An item is considered valid if the calculated correlation coefficient (r -count) is greater than the critical value (r -count $>$ r -table).

The results of the validity test for the 30 items of the IBL-Dictogloss incorporation questionnaire are presented below.

Validity Category	Number of Items
Valid	30
Invalid	0

Table 3.7. Validity Test Results of the IBL-Dictogloss Questionnaire

The results show that items exhibited strong positive correlations with the total score. The remarkably high item-total correlations across all questionnaire items reflect the instrument's ability to consistently capture students' overall perceptions towards IBL-Dictogloss, with each item reinforcing the central construct as theorized. No items were found to be weak or unrelated to the underlying scale. This consistent pattern indicates that each questionnaire item contributes meaningfully to measuring students' perceptions of the IBL-Dictogloss technique.

To evaluate the validity of the Synthetic Voice Sophistication Questionnaire, item-total Pearson correlation coefficients were computed for each item using SPSS. This analysis serves to determine the degree to which

each item is associated with the overall questionnaire total, reflecting its contribution to the measurement of students' perceptions of synthesized voice sophistication.

Validity Category	Number of Items
Valid	8
Invalid	0

Table 3.8. Validity Test Results of the Synthetic Voice Questionnaire

All items in the synthetic voice sophistication scale are therefore classified as valid on the basis of item-total correlation. This outcome confirms the robust psychometric quality of the instrument for capturing participants' perceptions of the sophistication level of synthetic voices.

3.8. Reliability Of the Instrument

Reliability is fundamentally defined as the consistency of test scores. Researchers employing measurement instruments must utilize specific techniques to quantify this stability. Ultimately, a robust assessment tool requires not only high validity but also high reliability, ensuring that the resulting data remains consistent across repeated measurements (Creswell and Creswell, 2018).

The data was initially computer-coded using SPSS. Cronbach's Alpha was employed to assess the reliability of the instruments in measuring the target areas accurately and consistently. The formula is as follows:

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N - 1) \cdot \bar{c}}$$

Notes:

N: The number of items

$\bar{c}$: Average covariance between item-pairs

$\bar{v}$: Average variance

The higher the alpha, the more reliable it would be, as outlined by Setiyadi (2018). Furthermore, to determine the reliability of the questionnaire, Cohen *et al.* (2005) provided a guideline as follows:

1. 0.90 : Very high reliability
2. 0.80 – 0.90 : High reliability
3. 0.70 – 0.79 : Average Reliability
4. 0.60 – 0.69 : Low Reliability
5. < 0.60 : Very low reliability

3.8.1. Reliability of the Listening Test

To assess the reliability of the instrument, Cronbach's Alpha coefficient was calculated using IBM SPSS Statistics through Kuder-Richardson 20 model, specific version of Alpha model designed for binary data, to measure the internal consistency.

Reliability Statistics			
	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Try-Out Test	.749	.925	26

Table 3.9. Reliability Statistic of Listening Test

The analysis revealed that Cronbach's Alpha and Cronbach's Alpha Based on Standardized Items for listening test has 0.749 and 0.925 respectively. According to several experts (Cohen *et al.*, 2005), a Cronbach's Alpha value above 0.7 is generally considered acceptable in social science research, indicating satisfactory internal consistency. Therefore, the listening instrument for both pre-test and post-test could be regarded as sufficiently reliable for measuring the intended constructs in this study.

3.8.2. Reliability of the Questionnaire

In evaluating the reliability of the Perception of IBL-Digtogloss questionnaire and Synthetic Voice Integration Perception, internal consistency was calculated through IBM SPSS Statistics using Alpha model and also measured using Cronbach's Alpha coefficient.

Reliability Statistics

Cronbach's Alpha	N of Items
0.935	30

Table 3.10. Reliability Statistic of Technique Implementation Questionnaires

The computed value for the 30 questionnaire items was 0.935. According to reliability benchmarks, an Alpha coefficient exceeding 0.9 is indicative of exceptional internal consistency, reflecting that the items consistently measure the underlying construct. Consequently, the instrument in question is regarded as extremely reliable for investigating learners' perceptions of inquiry-based learning through the Digtogloss technique.

Furthermore, reliability testing was also conducted to determine the internal consistency of the Synthetic Voice Integration Perception questionnaire.

Reliability Statistics

Cronbach's Alpha	N of Items
0.842	8

Table 3.11. Reliability Statistic of Synthetic Voice Questionnaires

The Cronbach's Alpha value for the eight-item instrument was calculated at 0.842. According to commonly accepted criteria, an alpha score between 0.8 and 0.9 suggests good reliability, demonstrating that the survey items are adequately aligned to measure perceptions regarding the integration of synthetic voice technology. Therefore, this result affirms the suitability of the questionnaire for gathering consistent and dependable responses in the context of synthetic voice applications in education.

3.9. Data Analysis

Various statistical computation test using SPSS were employed to assess the data. Prior to conducting further analysis in addressing the research topic, normality and homogeneity tests were applied as the presumption data.

3.9.1. Normality and Homogeneity Tests

Normality testing was performed for both the pre-test and post-test listening scores using Kolmogorov-Smirnov and Shapiro-Wilk tests.

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.257	30	<.001	.809	30	<.001
Posttest	.193	30	.006	.930	30	.049

a. Lilliefors Significance Correction

Table 3.12. Normality Test of Listening Test

For the pretest, the Kolmogorov-Smirnov statistic was 0.257 with a significance value of $(p) < .001$, and the Shapiro-Wilk statistic was 0.809 with $(p) < .001$. For the posttest, the Kolmogorov-Smirnov statistic was 0.193 with $(p) = .006$ and the Shapiro-Wilk statistic was 0.930 with $(p) = .049$.

The homogeneity of variances assumption was evaluated for the listening test scores using Levene's test under several criteria: mean, median, median with adjusted degrees of freedom, and trimmed mean.

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Hasil	Based on Mean	1.783	1	58	0.187
	Based on Median	1.450	1	58	0.233
	Based on Median and with adjusted df	1.450	1	55.326	0.234
	Based on trimmed mean	1.655	1	58	0.203

Table 3.13. Homogeneity Test of Listening Test

Across all approaches, the significance values were above the conventional alpha level of 0.05 (Mean $(p) = .187$, Median $(p) = .233$, Adjusted Median $(p) = .234$, Trimmed Mean $(p) = .203$). As all p-values exceeded 0.05, the test fails to reject the null hypothesis of equal variances (Field, 2013).

Even though the result of homogeneity testing was significantly met the assumption, the results of normality testing for the listening pre-test and post-test scores indicated significant deviations from the normal distribution, as evidenced by both

Kolmogorov-Smirnov and Shapiro-Wilk tests (all $(p) < 0.05$) (Cohen *et al.*, 2007). Such non-normality is not uncommon in educational research, especially when measuring learning outcomes or perceptions among relatively small groups. Factors contributing to non-normal distribution may include limited sample size, ceiling or floor effects, or heterogeneity in students' prior knowledge and abilities (Miceeri, 1989; Tabachnick and Fidell, 2014; Wang *et al.*, 2009).

Additionally, the process of learning, such as exposure to new instructional techniques or interventions, can produce skewed results in posttest or pretest measures, as some students may demonstrate rapid improvement while others progress more slowly. Given these considerations and the statistical evidence, the use of non-parametric, in this case Wilcoxon Signed-Rank, statistical techniques is warranted and aligns with best practices for analyzing data that do not meet the assumptions of normality.

Furthermore, normality was examined for the Perception of IBL-Dictogloss Incorporation questionnaire scores using both Kolmogorov-Smirnov and Shapiro-Wilk tests.

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Perception IBL-Dictogloss	0.117	30	.200*	0.962	30	0.340

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 3.14. Normality Test of Technique Implementation Questionnaire

According to the Kolmogorov-Smirnov test, the statistic was 0.117 and the significance value was $(p)=0.200$, which is above the conventional threshold of 0.05, suggesting that the data do not significantly depart from a normal distribution. However, the Shapiro-Wilk test yielded a statistic of 0.962 with $(p)=0.340$, indicating significance value exceeded the 0.05 normality barrier (Cohen *et al.*, 2007).

The last normality test was assessed for the Perception of Synthetic Voice in Listening Comprehension scores using the Kolmogorov-Smirnov and Shapiro-Wilk tests.

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Perception of Synthetic Voice	0.155	30	0.064	0.959	30	0.294

Table 3.15. Normality Test of Synthetic Voice Questionnaires

The Kolmogorov-Smirnov statistic was 0.155 with a significance value of (p)=0.064, while the Shapiro-Wilk statistic was 0.959 and (p)=0.294. Both significance values exceeded the conventional threshold of 0.05, indicating no statistically significant deviation from normality.

Given these results, it can be concluded that the data are approximately normally distributed. This allows for the use of parametric statistical procedures, such as means, standard deviations, and parametric hypothesis tests, in subsequent analyses of students' perceptions regarding the incorporation of IBL-Dictogloss Technique and the integration of synthetic voice technology in listening comprehension.

3.9.2. Data Analysis

To thoroughly analyze the data based on the presumption analyses, it would be treated through the following steps:

1. Scoring the data of listening test and questionnaire responses.

The result of the pre-test and post-test of the listening test and questionnaire responses is scored.

2. Analyzing the data

To examine the significance progress in students' listening comprehension of transactional intersection texts following the incorporation of IBL within Dictogloss Technique, the Wilcoxon Signed-Rank was utilized. This calculation was worthwhile to determine Z-Value, which was used to define the significance of this treatment by comparing scores.

Furthermore, pre-treatment and post-treatment Z-values for various listening comprehension aspects were analyzed via r scores to pinpoint the area of greatest improvement. The r scores were calculated using the formula advocated by Rosenthal (1991), the r scores were determined by dividing the Z-value by the square root of N (30).

The Wilcoxon Signed-Rank Test is a non-parametric statistical procedure utilized to compare two related samples or repeated measurements. As an alternative to the parametric paired-samples t-test, this method does not rely on the assumption of normality, making it uniquely suited for analyzing ordinal data (Field, 2013). Unlike the paired t-test, this non-parametric method compares related samples by ranking the differences between pairs, making it effective for detecting shifts in the median scores after the treatment.

Furthermore, the questionnaire's indicator mean scores were analyzed to measure students' perceptions regarding their listening comprehension experiences with IBL-Dictogloss and the sophistication of synthetic voice. The numerical scores are provided for the elements of Likert-specific questionnaires (e.g., strongly disagree =1, disagree =2, neutral = 3, agree=4, and strongly agree=5). The mechanism to determine whether the perception is positive or negative is cutting off the 50% point. Following standard Likert interpretation practices, Likert-type questionnaire responses were analyzed descriptively using mean scores and percentage distributions (Boone Jr and Boone, 2012). Perceptions were characterized as positive when the mean exceeded the scale midpoint (3.0 on a 5-point scale). Additionally, responses of "Agree" and "Strongly Agree" (categories 4-5) were counted as positive responses for percentage reporting.

3. Interpreting, describing and drawing conclusion

The pre-test and post-test scores are statistically analyzed through IBM SPSS. The result of the pre-test and post-test is processed by using the Wilcoxon Signed-Rank to answer RQ1 and RQ2. And for RQ 3 and RQ 4, the result of the questionnaire is measured via the One Sample Test to know the total mean score. All are then interpreted, described and drawn to a conclusion.

3.10. Data Treatment

Data treatment involves organizing, cleaning, and preparing the collected data for analysis. Here is a step-by-step guide on how to treat the data for your research:

1) **Data Organization:**

Systematically organize the collected data. Ensure that each set of data corresponds to the identified variables and conditions.

2) **Data Cleaning:**

Check for any missing or incomplete data points. Address any issues related to data completeness. Identify and handle any outliers or anomalies in the data. Decide whether to exclude or adjust these data points based on the nature of the outliers.

3) **Coding and Labelling:**

Assign codes or labels to different conditions, groups, or variables. This ensures clarity and consistency during the analysis. Double-check the accuracy of codes and labels to prevent errors during the analysis phase.

4) **Assessing data distribution**

A normality test is performed in order to assess the distribution of the provided data for normality by comparing the p-value to the predetermined significance threshold, often set at 0.05. If the calculated p-value exceeds the predetermined significance level, it indicates insufficient evidence to reject the null hypothesis of normality. Consequently, it can be inferred that the observed data was not normally distributed.

5) **Data Analysis**

An examination is conducted on the data to determine the effect of integrating the dictogloss technique with IBL towards the students' listening comprehension. Utilizing statistical methods to compare pre-test and post-test scores, determine the mean value of improving the listening aspect and students' perception towards the intervention and the use of synthetic voice.

6) **Data Interpretation**

After the data analysis, the findings were interpreted in light of the research objectives.

7) Data Reporting

Subsequently, a research paper or report authored to present the findings. The results, discussion of every implication, and recommendations presented as the basis for reporting the findings.

3.11. Hypothetical Test

Hypothesis suggests an expected relationship between variables and are testable through empirical research. Based on the research questions provided, here is the corresponding hypothesis:

1. Hypothesis for the main Research Question

- Null Hypothesis (H_0): There is no significant difference in students' listening comprehension after the students have been taught by using the incorporation of IBL with the Dictogloss Technique.
- Alternative Hypothesis (H_1): There is a significant difference in students' listening comprehension after the students have been taught by using the incorporation of IBL with the Dictogloss Technique.

This hypothesis provides a clear basis for testing the effectiveness of incorporating the IBL with the Dictogloss technique on students' listening comprehension. The null hypothesis suggests no effect or improvement, while the alternative hypothesis suggests a significant effect or improvement. The research would involve collecting data and conducting statistical analysis to accept or reject the null hypothesis in favor of the alternative hypothesis.

This chapter has elaborated on the research methodologies used to collect and analyze the data for this research.

V. CONCLUSION AND SUGGESTION

This final chapter summarizes the principal findings, consequences and limitation of the current study. It provides, then, suggestions for English teachers in Indonesian context, students and other researchers on implementing the results and overcoming recognized issues. These results aimed for educators in improving pedagogical approaches, assist learners in their learning engagement, and direct future researches toward investigating unique aspects of collaborative learning and technological sophistication in language learning.

5.1. Conclusion

The research demonstrates that incorporating Inquiry-Based Learning (IBL) with the Dictogloss Technique represents a statistically significant and educationally sound approach for enhancing students' listening comprehension in EFL contexts. The study revealed a statistically significant improvement in students' listening comprehension following the implementation of IBL with Dictogloss. It provides evidence that the improvement is genuine and not attributable to chance. This improvement occurred within a supportive, engaging, and motivating context, validating the intervention's pedagogical soundness.

The intervention demonstrated differential improvement across listening dimensions, revealing important insights about the specific skills that responded most effectively to the treatment. Detail Recognition showed the highest improvement, demonstrating that students effectively captured specific information through active listening during group reconstruction activities. Vocabulary also improved substantially, reflecting the collaborative meaning-making that occurred during the reconstruction phase when students pooled their linguistic resources. Sequence Recognition showed a significant gain, with the inquiry-based approach encouraging students to logically organize events and understand the order of information.

However, two aspects showed minimal improvement. Main Idea comprehension and Inference, representing non-significant change. This pattern reflects a ceiling effect, where students were already relatively proficient at grasping the general message and making logical deductions in the pretest. The improvement pattern reveals a cognitively consistent reorganization: the Dictogloss technique is structurally biased toward detail-oriented processing because accurate text reconstruction requires students to identify and remember specific nouns and verbs. In contrast, inference skills require implicit meaning interpretation, which the relatively short intervention period did not fully develop.

Student perception of the intervention was overwhelmingly positive, represents what can be characterized as near-universal positive reception, indicating exceptional acceptability across the diverse student population. The assessment of synthetic voice technology revealed both significant strengths and one critical limitation. The strongest finding was in independent problem-solving promotion, agreed that the synthetic content successfully promoted autonomous learning behaviors and student agency in knowledge-seeking. However, direction clarity emerged as the primary concern. Students rating in direction represents the weakest-performing item on the questionnaire. This issue appears to stem from multiple technical factors including pronunciation clarity and accent perception concerns, speaking pace that may be either too fast or too slow for student processing, intonation patterns lacking natural emphasis markers, background noise or audio quality issues, and complex sentence structures used in direction delivery.

The comprehensive evidence aligns with multiple theoretical frameworks and more than twenty previous research studies, providing robust validation that the intervention represents educationally sound, evidence-based practice for developing listening comprehension and fostering positive language learning experiences.

5.2. Suggestion

The research successfully demonstrates that Inquiry-Based Learning with Dictogloss Technique, when combined with appropriately optimized synthetic voice technology, represents a viable and effective approach for enhancing EFL

listening comprehension. The statistically significant improvement, near-universal positive student perception, and theoretical validation across multiple frameworks provide strong evidence for the intervention's effectiveness. Teachers are strongly encouraged to incorporate IBL with the Dictogloss Technique as an effective method for developing higher-order listening skills, particularly for detail recognition, sequence recognition, and vocabulary comprehension. Synthetic voice technology should be utilized as a supplementary tool for creating customizable, level-appropriate listening materials that can be tailored to specific student needs and proficiency levels. It is essential that teachers maintain collaborative structures that foster peer support, reduce anxiety, and promote student agency throughout the implementation process.

However, the research limits on the design included assessment that only be done on three weeks after intervention completion, leaving a significant gap in understanding long-term effectiveness. This short timeframe is insufficient for determining whether improvements persist as permanent skill development or represent temporary gains that fade over time. The design cannot distinguish between temporary performance increases and genuine permanent skill development. Long-term motivation maintenance also remains undocumented, leaving uncertainty about whether the high motivation observed during intervention continues beyond the immediate post-intervention period. To address these limitations, future implementation should include extended assessment protocols with evaluations conducted at 8-12 weeks post-intervention, at six months, and at one year following intervention completion. Retention testing using comparable listening tasks would assess skill persistence over time. Motivation monitoring could track ongoing engagement levels beyond the intervention period to document sustainability of motivational benefits. Transfer testing would assess whether skills developed in the intervention context transfer to new listening contexts and situations.

Future research should also investigate the Main Idea and Inference development question through longitudinal studies designed to determine whether the minimal improvement observed in these areas represents a temporary cognitive adaptation phase or a persistent limitation of the technique. A minimum duration of 8-12 weeks

is suggested to observe sustained patterns and determine whether extended implementation modifies these outcomes.

Given the persistent challenge with synthetic voice direction clarity, critical research areas warrant investigation. Audio parameter specification studies should identify optimal accent and pronunciation patterns for EFL learners, determine ideal speaking pace variation by proficiency level, test varying intonation patterns' effectiveness, and assess tolerance levels for background noise in learning environments. synthetic voice customization studies should compare male versus female voice effectiveness, test accent varieties such as American, British, and Australian English, evaluate emotional tone and affect in educational contexts, and measure individual learner preference patterns. Pedagogical integration research should study optimal timing for synthetic voice use in instruction versus content delivery, compare synthetic voice effectiveness against native speaker audio, investigate exposure time requirements for learner adaptation, and analyze combination approaches integrating synthetic and human voice.

Collaborative learning dynamics deserve further investigation through studies, examining how group composition variables affect group performance outcomes. Research should explore what types and depths of peer interaction most effectively support comprehension development. Comparative research examining when small group processing yields superior results compared to larger group collaboration would help clarify optimal instructional arrangements.

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