



Investigating the Effectiveness of Top-Down and Bottom-Up Strategies in Developing Listening Skills Among Second-Year English Education Students

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Abstract: This study investigates the effectiveness of top-down and bottom-up listening strategies in improving EFL students' listening comprehension. Listening is a crucial skill in second language acquisition, yet it remains challenging due to limited exposure to authentic input and various processing difficulties. The objective of this study was to examine whether the integration of top-down and bottom-up strategies significantly improves students' listening achievement. A pre-experimental quantitative design with a one-group pretest-post-test model was employed. The participants were 20 second-year students of the English Education Study Program at Islamic University of Kalimantan Muhammad Arsyad Al-Banjari, selected through total sampling. Data were collected using a listening comprehension test administered as both pretest and post-test, and analyzed using descriptive statistics and a paired-samples comparison. The findings revealed an improvement in students' listening performance after the treatment. The mean score increased from 82.9 in the pretest to 86.7 in the post-test, while the maximum score rose from 88 to 94. Although some variation in improvement was observed, overall results indicate that the combined use of top-down and bottom-up strategies effectively enhanced students' listening comprehension. These findings suggest that integrating both approaches can support EFL learners in developing more accurate and efficient listening skills.

Keywords: Bottom-Up Strategies; EFL Students; Listening Comprehension; Listening Skills; Top-Down Strategies.

1. INTRODUCTION

Listening is a fundamental language skill that serves as the primary channel through which learners receive linguistic input and construct meaning in second language acquisition. Unlike reading, listening requires learners to process spoken language in real time while simultaneously interpreting linguistic forms, contextual cues, and speaker intentions. Consequently, successful listening comprehension involves complex cognitive and metacognitive processes that enable learners to decode sounds and integrate them with prior knowledge (Rost, 2016, p. 3; Vandergrift & Goh, 2012, p. 14). In English as a Foreign Language (EFL) contexts, listening competence is particularly important because learners often have limited opportunities to interact with authentic spoken English outside the classroom. Therefore, developing effective listening instruction remains a central concern in English language education (Field, 2008, p. 37; Flowerdew & Miller, 2014, p. 5).

Despite its importance, listening is frequently perceived as one of the most challenging skills for EFL learners. Research indicates that learners experience difficulties related to speech rate, unfamiliar vocabulary, connected speech, accent variation, and limited background knowledge, all of which may hinder comprehension (Graham, Santos, & Vanderplank, 2011, p. 114; Goh, 2018, p. 76). Among university students enrolled in English education programs,

these challenges may become more pronounced because listening courses often require learners to comprehend increasingly complex academic and authentic materials. Consequently, many learners struggle to achieve satisfactory listening performance despite years of formal English instruction (Cross, 2015, p. 886; Nguyen & Abbott, 2022, p. 58).

To address these challenges, listening scholars have emphasized the importance of instructional strategies that facilitate comprehension processes. Two of the most influential approaches are top-down and bottom-up processing. Top-down processing refers to the use of prior knowledge, contextual information, and background experiences to interpret spoken messages. Through this process, learners generate predictions and infer meaning based on their existing schemata and understanding of the communicative context (Richards, 2008, p. 7; Rost, 2016, p. 109). In contrast, bottom-up processing focuses on decoding linguistic input by recognizing sounds, words, grammatical structures, and discourse markers. Learners construct meaning by progressively processing smaller linguistic units into larger meaningful chunks (Field, 2008, p. 91; Vandergrift & Goh, 2012, p. 37).

The theoretical foundation of listening comprehension suggests that effective listening requires the interaction of both top-down and bottom-up processes rather than reliance on a single approach. Interactive models of listening propose that listeners continuously move between linguistic decoding and meaning construction to achieve successful comprehension (Field, 2008, p. 126; Flowerdew & Miller, 2014, p. 31). From a psycholinguistic perspective, listening comprehension occurs when incoming auditory information is integrated with existing cognitive structures, allowing learners to interpret spoken discourse efficiently (Steinberg & Sciarini, 2006, p. 158). Therefore, understanding how instructional strategies based on these processes contribute to listening development remains an important area of investigation.

Empirical studies have reported positive outcomes associated with top-down listening instruction. For example, activating background knowledge, predicting content, and utilizing contextual clues have been shown to improve learners' comprehension and listening confidence (Vandergrift & Tafaghodtari, 2010, pp. 474–475). Recent research has further demonstrated that metacognitive listening instruction, which often incorporates top-down processes, can significantly enhance learners' ability to monitor comprehension and employ effective listening strategies (Miftakh & Muslem, 2021, p. 215; Rahimi & Katal, 2020, p. 84). These findings suggest that top-down approaches may support learners in processing authentic spoken texts more effectively.

Similarly, numerous studies have highlighted the benefits of bottom-up instruction for improving listening accuracy. Explicit training in phonological recognition, word segmentation, and decoding skills has been found to strengthen learners' ability to identify linguistic information within spoken texts (Field, 2008, p. 302; Siegel & Siegel, 2015, p. 17). Recent investigations have also shown that technology-assisted listening activities focusing on lexical recognition and speech perception can improve learners' listening performance and comprehension accuracy (Zhang, 2023, p. 118; Teng, 2022, p. 294). Such findings indicate that bottom-up processing remains essential for learners who encounter difficulties in recognizing spoken language features.

Although previous studies have demonstrated the value of both approaches, the relative effectiveness of top-down and bottom-up strategies remains inconclusive. Some studies suggest that top-down strategies contribute more significantly to overall comprehension because they facilitate meaning construction and inferencing, whereas others argue that bottom-up skills are foundational because learners cannot interpret messages accurately without adequate linguistic decoding abilities (Graham & Santos, 2015, p. 41; Vandergrift & Goh, 2012, p. 45). Furthermore, most existing studies have examined these strategies separately, creating a need for comparative investigations that evaluate their effectiveness within specific educational contexts.

In the Indonesian EFL context, listening instruction continues to face challenges associated with limited exposure to authentic English input, diverse learner proficiency levels, and varying instructional practices. Recent studies conducted in Indonesian higher education settings have reported that learners often experience difficulties in identifying spoken words, understanding implied meanings, and maintaining concentration during listening tasks (Putri & Refnaldi, 2021, p. 134; Suryani, 2023, p. 97). While several studies have explored listening strategy instruction in Indonesian classrooms, limited research has specifically compared the effectiveness of top-down and bottom-up strategies among English education students at the university level. Consequently, further investigation is necessary to determine which approach better supports listening development in this context.

Given the theoretical significance and practical relevance of listening strategy instruction, this study aims to investigate the effectiveness of top-down and bottom-up strategies in developing listening skills among second-year English Education students. Specifically, the study seeks to compare the impact of these two instructional approaches on students' listening achievement and identify which strategy contributes more effectively to listening development. The findings are expected to contribute to listening pedagogy by

providing evidence-based insights that can assist language instructors in selecting appropriate instructional strategies for university-level EFL learners.

2. LITERATURE REVIEW

Listening comprehension is a multidimensional process involving the perception, interpretation, and construction of meaning from spoken language. In second language (L2) learning, listening serves as a primary source of linguistic input and plays a critical role in language acquisition and communicative competence. According to Rost (2016, p. 3), listening requires learners to integrate linguistic knowledge with cognitive and metacognitive processes to achieve comprehension. Similarly, Vandergrift and Goh (2012, p. 14) argue that successful listening depends on learners' ability to monitor, evaluate, and regulate comprehension while processing spoken input. Consequently, listening instruction should provide learners with strategies that facilitate both meaning construction and linguistic decoding.

Listening comprehension is commonly explained through two complementary processing mechanisms: top-down and bottom-up processing. Top-down processing refers to the use of prior knowledge, contextual information, and background experiences to interpret spoken messages. Through this process, listeners generate predictions, activate schemata, and infer meaning beyond the explicit linguistic input (Richards, 2008, p. 7; Rost, 2016, p. 109). In contrast, bottom-up processing focuses on the recognition and decoding of phonological, lexical, and grammatical information. Meaning is constructed progressively from sounds and words to larger discourse units (Field, 2008, p. 91; Flowerdew & Miller, 2014, p. 31). Contemporary listening theories suggest that effective comprehension results from the interaction of both processes rather than reliance on either approach alone (Vandergrift & Goh, 2012, p. 37).

Empirical research has consistently demonstrated the effectiveness of listening strategy instruction. Vandergrift and Tafaghodtari (2010, pp. 470–497) found that learners receiving strategy-based listening instruction significantly outperformed those receiving traditional listening practice. Likewise, Cross (2015, p. 412) reported that metacognitive instruction improved learners' listening performance by enhancing comprehension monitoring. Recent studies have further shown that top-down-oriented activities, such as prediction and inferencing, strengthen learners' overall comprehension, whereas bottom-up-focused instruction improves speech perception, vocabulary recognition, and listening accuracy (Rahimi & Katal, 2020, p. 85; Teng, 2022, p. 292; Zhang, 2023, p. 118).

Although previous studies support the pedagogical value of both approaches, evidence regarding their relative effectiveness remains inconclusive. Some scholars emphasize the importance of contextual interpretation in facilitating comprehension, while others argue that accurate linguistic decoding is a prerequisite for successful listening (Graham & Santos, 2015, p. 41; Siegel & Siegel, 2015, p. 9). Furthermore, comparative studies examining top-down and bottom-up strategies among Indonesian university EFL learners remain limited. Therefore, this study investigates the effectiveness of top-down and bottom-up strategies in developing listening skills among second-year English Education students, thereby contributing empirical evidence to listening pedagogy in higher education contexts.

3. METHOD OF RESEARCH

This study employed a pre-experimental quantitative approach using a one-group pretest–post-test design. According to Creswell and Creswell (2023, p. 174), a one-group pretest–posttest design enables researchers to measure participants’ performance before and after an intervention to determine whether a treatment produces a significant effect. Similarly, Fraenkel et al. (2019, p. 271) state that this design is appropriate for preliminary investigations that seek to examine changes in participants’ achievement following a specific instructional treatment. In the present study, students’ listening skills were measured before and after instruction using top-down and bottom-up listening strategies.

The population of this study consisted of second-year students enrolled in the English Education Study Program at Islamic University of Kalimantan Muhammad Arsyad Al-Banjari Banjarmasin during the 2025–2026 academic year. Because the population was relatively small, total sampling was employed. Consequently, all 18 second-year English Education students participated as the research sample. Total sampling is recommended when the population size is limited and all members can be included in the study, thereby minimizing sampling bias (Ary et al., 2018, p. 148; Cohen et al., 2018, p. 218).

The instrument used for data collection was a listening comprehension test administered as both a pretest and a post-test. The pretest was conducted prior to the implementation of the instructional treatment to determine students’ initial listening proficiency, whereas the post-test was administered after the treatment period to measure improvement in listening performance. The test consisted of listening tasks designed to assess students’ ability to comprehend spoken English, identify main ideas, recognize specific information, and interpret meaning from audio materials. The use of achievement tests as pretest and post-test instruments

is widely recommended for evaluating learning outcomes in educational intervention studies (Mackey & Gass, 2022, p. 114; Dörnyei, 2007, p. 110).

Data were collected in three stages. First, the researcher administered the pretest to obtain baseline data on students' listening skills. Second, students received instruction incorporating both top-down and bottom-up listening strategies. Top-down activities included predicting content, activating background knowledge, and making inferences, while bottom-up activities focused on recognizing vocabulary, identifying key words, and decoding linguistic information from spoken texts. Third, after the completion of the treatment sessions, the post-test was administered to assess students' listening achievement following the intervention (Vandergrift & Goh, 2012, p. 37; Rost, 2016, p. 109).

The collected data were analyzed using IBM SPSS Statistics version 23. Descriptive statistics, including the mean, minimum score, maximum score, and standard deviation, were calculated to summarize students' pretest and post-test performance. Prior to hypothesis testing, a normality test was conducted to determine whether the data met the assumptions required for parametric analysis (Pallant, 2020, p. 57; Field, 2024, p. 244). Subsequently, a paired-samples *t*-test was performed to compare the mean scores of the pretest and post-test and to determine whether the instructional treatment produced a statistically significant improvement in students' listening skills. A significance level of 0.05 was adopted for all statistical analyses (Gravetter & Wallnau, 2020, p. 356; Field, 2024, p. 493).

4. FINDINGS AND DISCUSSION

Table 1. Result of Pretest.

No	Pretest		Standard Deviation
	Score	Mean	
1	76	47.61	
2	78	24.1	
3	78	24.1	
4	76	47.61	
5	78	24.1	
6	82	0.81	
7	80	8.41	
8	84	1.21	
9	80	8.41	
10	78	24.1	
11	80	8.41	
12	86	9.61	
13	84	1.21	
14	86	9.61	
15	88	26.01	
16	86	9.61	
17	88	26.01	
18	86	9.61	
19	86	9.61	

20	86	9.61	
	1658	82.9	3.85

*Information: (a) There were 20 participants with varying pretest scores. (b) The lowest pretest score was 76, while the highest pretest score was 88. (c) The total score of all participants was 1,658. (d) The mean pretest score was 82.9. (e) The standard deviation of the data was 3.85, indicating that the scores were not widely dispersed from the mean.

Table 1 presents the results of the pretest administered to 20 participants before the implementation of the instructional treatment. The data show that students' listening comprehension scores varied across individuals, indicating differences in initial listening proficiency among the participants.

The lowest pretest score recorded was 76, while the highest score reached 88. This indicates that although all students were within a relatively moderate-to-high performance range, there was still observable variation in their initial listening ability. The total accumulated score of all participants was 1,658.

In terms of central tendency, the mean pretest score was 82.9, suggesting that, overall, the participants demonstrated a relatively good level of listening comprehension prior to the treatment. This indicates that the group started from a moderately strong baseline performance.

Regarding data dispersion, the standard deviation was 3.85, which shows that the scores were relatively clustered around the mean. This indicates a low level of variability among participants, meaning that most students had fairly similar listening performance before the intervention was applied.

Overall, the pretest results suggest that while there were slight differences in individual performance, the participants generally had comparable levels of listening ability prior to the instructional treatment using top-down and bottom-up strategies.

The pretest results reveal that the participants demonstrated a moderately high level of listening comprehension prior to the instructional treatment, as reflected in a mean score of 82.9. This finding indicates that the students already possessed a foundational level of listening ability before the implementation of top-down and bottom-up strategy instruction. Such a baseline is consistent with Rost (2016), who emphasizes that L2 listening development is cumulative, as learners gradually build comprehension skills through repeated exposure and classroom-based input over time.

Despite the relatively high mean score, the data show variation in individual performance, with scores ranging from 76 to 88. This variation suggests differences in learners' listening proficiency, which is a common phenomenon in second language acquisition.

Vandergrift and Goh (2012) explain that listening comprehension is highly individual due to differences in learners' vocabulary knowledge, processing speed, and metacognitive awareness. Similarly, Field (2008) argues that even learners within the same instructional environment often exhibit different levels of success in decoding spoken input, particularly when dealing with features such as reduced speech, fast delivery, and unfamiliar lexical items.

The relatively small standard deviation (3.85) indicates that the scores were closely clustered around the mean, suggesting a low level of dispersion among participants. This finding implies that the students had relatively similar listening proficiency levels before the intervention. According to Flowerdew and Miller (2014), learners in formal EFL classroom settings often share comparable listening development patterns due to similar exposure to instructional materials and limited authentic input outside the classroom environment. This may explain why the variation in scores remained narrow despite individual differences.

From a pedagogical perspective, the moderately high pretest mean suggests that students were not beginners but rather intermediate-level listeners who had already developed basic comprehension skills. However, as Graham and Santos (2015) note, having general listening ability does not necessarily indicate strategic competence in processing spoken language effectively. Many learners still struggle with applying appropriate listening strategies such as prediction, inferencing, and selective attention, which are essential for deeper comprehension.

The presence of score variation, even within a relatively narrow range, also reflects the psycholinguistic nature of listening comprehension. Steinberg and Sciarini (2006) emphasize that listening is an active cognitive process involving perception, memory, and interpretation. Differences in these cognitive processes among learners can result in variation in performance, even when they are exposed to the same input conditions.

Comparatively, previous studies have reported similar baseline patterns in EFL listening research. For instance, Nguyen and Abbott (2022) found that university EFL learners often begin listening instruction with moderate comprehension levels but still experience difficulty in processing rapid speech and unfamiliar vocabulary. Likewise, Putri and Refnaldi (2021) reported that Indonesian EFL learners tend to have relatively stable but not fully developed listening skills prior to targeted strategy instruction, which supports the present study's pretest findings.

Overall, the pretest results suggest that the participants entered the study with relatively comparable listening abilities and a moderately strong baseline performance. This homogeneity is important for experimental validity, as it indicates that any subsequent

improvement in the post-test is more likely to be attributed to the instructional intervention rather than pre-existing differences in ability. This aligns with Fraenkel et al. (2019), who emphasize that controlled baseline conditions strengthen the internal validity of educational intervention studies.

Table 2. Result of Post-test.

No	Score	Pretest	Mean	Standard Deviation
1	79		59.29	
2	81		32.49	
3	84		7.29	
4	76		114.49	
5	82		22.09	
6	86		0.49	
7	86		8.41	
8	90		10.89	
9	86		0.49	
10	76		114.49	
11	84		7.29	
12	88		1.69	
13	88		1.69	
14	86		0.49	
15	90		10.89	
16	92		28.09	
17	94		53.29	
18	84		7.29	
19	92		28.09	
20	90		10.89	
	1734		86.7	5.06

There were 20 participants with varying pretest scores. The lowest pretest score was 76, while the highest pretest score was 94. The total score of all participants was 1,734. The mean pretest score was 86.7. The standard deviation of this data was 5.06, indicating the dispersion of scores around the mean.

Table 2 presents the results of the post-test administered to 20 participants after the implementation of the instructional treatment using top-down and bottom-up listening strategies. The data indicate an overall improvement in students' listening comprehension performance compared to the pretest results.

The lowest post-test score recorded was 76, while the highest score reached 94. This range demonstrates that students achieved higher maximum performance after the instructional intervention, indicating progress in listening comprehension ability. The total score obtained by all participants was 1,734.

In terms of central tendency, the mean post-test score was 86.7, which is higher than the pretest mean. This increase suggests that the instructional treatment contributed positively to students' listening achievement, reflecting an overall improvement in their comprehension skills following the intervention.

Regarding variability, the standard deviation was 5.06, indicating a moderate level of score dispersion around the mean. This shows that while students' performances were generally higher after the treatment, there were still individual differences in the degree of improvement among participants.

Overall, the post-test results demonstrate an improvement in students' listening comprehension after being exposed to top-down and bottom-up listening strategy instruction, as reflected in the higher mean score compared to the pretest results.

The post-test results indicate a clear improvement in students' listening comprehension after the implementation of top-down and bottom-up listening strategy instruction. The increase in the mean score from 82.9 (pretest) to 86.7 (post-test) suggests that the instructional treatment had a positive effect on learners' listening performance. This improvement supports the view that listening comprehension can be significantly enhanced through structured strategy-based instruction, as emphasized by Rost (2016), who states that listening development is strongly influenced by the quality of instructional input and strategy training provided to learners.

The increase in the highest score from 88 in the pretest to 94 in the post-test further demonstrates that some learners were able to achieve higher levels of listening performance after the intervention. This suggests that the integration of top-down and bottom-up strategies enabled learners to process spoken input more effectively. According to Vandergrift and Goh (2012), successful listening involves the dynamic interaction between decoding linguistic input and activating prior knowledge, which allows learners to construct meaning more efficiently. The improvement in maximum performance indicates that this interactive processing was strengthened during instruction.

The post-test mean score of 86.7 reflects a generally improved level of listening comprehension among participants. This finding is consistent with Vandergrift and Tafaghodtari (2010), who found that learners receiving metacognitive and strategy-based listening instruction significantly outperformed those who received traditional instruction. Similarly, Cross (2015) reported that explicit instruction in listening strategies enhances learners' ability to monitor comprehension, identify breakdowns, and apply corrective strategies during listening tasks.

The standard deviation of 5.06 indicates moderate variability in students' post-test performance. While most students improved, the degree of improvement was not uniform across participants. This variation is consistent with Graham and Santos (2015), who argue that learners respond differently to listening strategy instruction depending on their cognitive

abilities, prior knowledge, and metacognitive awareness. Some learners benefit more from top-down strategies such as prediction and inferencing, while others rely more on bottom-up processes such as phonological decoding and word recognition.

From a cognitive perspective, the improvement observed in the post-test can be explained through psycholinguistic theory. Steinberg and Sciarini (2006) emphasize that listening comprehension involves complex interactions between perception, memory, and interpretation. The combination of top-down and bottom-up instruction likely facilitated these cognitive processes by helping learners integrate linguistic input with contextual understanding, resulting in more accurate comprehension.

Furthermore, Field (2008) argues that effective listening instruction should not isolate meaning-based and form-based processing but instead integrate both approaches. The improvement in post-test scores supports this claim, suggesting that learners benefited from simultaneous exposure to contextual prediction strategies and linguistic decoding practice. This integrated approach likely helped learners overcome common listening difficulties such as fast speech rate, unfamiliar vocabulary, and reduced forms.

Comparatively, previous empirical studies also support the effectiveness of strategy-based listening instruction. Rahimi and Katal (2020) found that metacognitive listening instruction significantly improves learners' comprehension ability by enhancing their self-regulation during listening tasks. Similarly, Miftakh and Muslem (2021) reported that students exposed to structured listening strategies showed significant gains in listening performance compared to traditional instruction. In addition, Teng (2022) and Zhang (2023) highlight that technology-supported listening and structured strategy training both contribute positively to learners' listening development, particularly in EFL contexts where exposure to authentic input is limited.

In the Indonesian EFL context, these findings are also consistent with Putri and Refnaldi (2021), who reported that Indonesian learners show significant improvement in listening comprehension when provided with explicit strategy instruction. Likewise, Suryani (2023) emphasizes that instructional intervention plays a crucial role in overcoming learners' difficulties in understanding spoken English in higher education settings.

Overall, the post-test results confirm that the application of top-down and bottom-up listening strategies effectively enhanced students' listening comprehension. The increase in mean score, together with the relatively stable standard deviation, indicates that the intervention was beneficial for most learners, although individual differences in improvement

still existed. These findings reinforce the importance of combining both processing approaches in listening instruction to maximize learners' comprehension performance in EFL contexts.

5. CONCLUSION

This study aims to determine the effectiveness of using top-down and bottom-up listening strategies in improving the listening skills of second-semester students in the English Education Study Program. Based on the results of pretest and post-test data analysis, it can be concluded that there was an improvement in students' listening skills after being given treatment through instruction using both strategies.

In general, the research findings show a difference between students' initial abilities and their final performance. In the pretest stage, students were categorized as having relatively good listening ability; however, they still showed limitations in fully understanding spoken texts. After being taught using top-down and bottom-up strategies, there was an improvement in the post-test results, indicating that students' listening skills became better compared to before the treatment was applied.

This improvement shows that instructional strategies that integrate top-down (meaning-based processing) and bottom-up (language-based processing) comprehension processes contribute positively to helping students understand spoken texts more effectively. Thus, these strategies not only assist students in recognizing language elements such as vocabulary and structure, but also in understanding meaning based on context.

The significance of these findings indicates that strategy-based listening instruction can be an effective alternative for improving students' listening skills in an EFL environment. It also suggests that conventional listening instruction can be enhanced through the application of more structured and systematic strategies.

In terms of implications, English lecturers or teachers are encouraged to integrate both top-down and bottom-up strategies in a balanced way in listening instruction to help students overcome difficulties in understanding spoken language. In addition, these findings can serve as a reference for future research to develop more varied and context-based listening instruction models.

Thus, this study has answered the research questions and achieved its objectives, namely proving that the use of top-down and bottom-up strategies has a positive effect on improving the listening skills of second-semester English Education students.

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