The Potential of Processing Instruction for EFL Speaking Skills Development: A Bibliometric and Theoretical Synthesis

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Abstract

Processing Instruction (PI) has gained significant attention as an input-based pedagogical approach, yet its specific contribution to speaking development among non-English major students remains insufficiently explored. This bibliometric and empirical synthesis examines research trends, thematic focuses, and pedagogical implications of PI for enhancing speaking proficiency. Using Scopus data from 2000 to 2025, 542 publications were analyzed with VOSviewer© to identify patterns in scholarly output, keyword co-occurrence, and conceptual evolution. Findings reveal increasing interest in PI over the past decade, with emerging emphasis on communicative competence, fluency, affective factors, and multimodal instructional contexts. Empirical evidence indicates that PI strengthens form-meaning connections, reduces speaking anxiety, and supports real-time pragmatic performance, particularly when embedded within learner-centered, pre-speaking instructional stages. Despite promising outcomes, gaps persist regarding direct speaking assessments, longitudinal effects, and non-English major contexts. The review highlights PI's potential to inform innovative curricula and calls for targeted research integrating PI with communicative teaching models.

Keywords: bibliometric analysis, processing instruction, input-based instruction, EFL speaking skills

1. Introduction

Developing speaking proficiency is one of the most significant challenges in English as a Foreign Language (EFL) education, particularly for non-English major students. These learners often receive limited exposure to authentic language use and communicative practice, resulting in weak oral fluency and low self-confidence in spoken interaction (Phuong Thanh & Van Tuan, 2014; Smith & King, 2013). Traditional teaching methods, which emphasize rote grammar drills and textbook exercises, have often proven insufficient in addressing the communicative needs of this group (Diamond et al., 2019; Subekti, 2018). This necessitates the exploration of more effective, learner-centered approaches that prioritize comprehension and spoken interaction.

Processing Instruction (PI), grounded in VanPatten's Input Processing theory, offers a promising input-based alternative to traditional output-focused instruction. In contrast to production-driven models, PI emphasizes structured input activities designed to help learners make form-meaning connections before engaging in output (Diamond et al., 2019; Falout et al., 2009; Mangold et al., 2025). Although originally developed for grammar acquisition, PI's focus on meaningful input and learner cognitive processing has sparked growing interest in its potential to improve oral proficiency. Research has shown that PI can enhance learners' grammatical accuracy and listening comprehension, foundational skills for fluent speaking (Chan, 2019; Torkabad & Fazilatfar, 2014). Despite its theoretical strengths, PI's role in developing speaking skills particularly among non-English majors，which remains underexplored in empirical literature. While studies have demonstrated that PI can promote recognition of complex grammatical structures and boost learner confidence (Amirjalili & Jabbari, 2018; Ren & Wang, 2024), there is limited synthesis of how PI is currently being applied in speaking instruction. Furthermore, the literature is fragmented, with research dispersed across varied contexts, methodologies, and learner populations. A systematic overview of scholarly trends is necessary to understand how PI is evolving as a tool for oral language development (Baleghizadeh & Saharkhiz, 2014; Leontjev et al., 2016).

Bibliometric analysis offers a powerful method to map the intellectual landscape of a given research area (Elihami et al., 2025). By examining patterns in publication volume, citation frequency, and keyword co-occurrence, this approach provides quantitative insights into research trajectories, key contributors, and thematic hotspots. In language education, bibliometric studies have been used to highlight growth in areas such as task-based learning and content-integrated instruction, but few, if any, focused specifically on PI and speaking skills. This presents an opportunity to apply bibliometric tools to trace how PI has been explored in relation to speaking development in EFL contexts (Domenteanu et al., 2024; Qu et al., 2024).

Therefore, the purpose of this study is to conduct a bibliometric analysis of scholarly publications on Processing Instruction and its impact on speaking skill enhancement for non-English major students. The study aims to identify research trends, influential authors and institutions, conceptual clusters, and underexplored areas in the field. By synthesizing the evolution and current focus of this research

domain, the study seeks to inform future empirical work and contribute to more targeted pedagogical innovation in EFL speaking instruction.

2. Brief Review of PI for Promoting Speaking Skills

2.1 PI and Input Processing Theory

PI is an input-based pedagogical intervention grounded in Input Processing (IP) theory, a model first proposed by VanPatten (1993). The IP theory argues that second language (L2) learners process language input by prioritizing meaning over grammatical form. Learners typically overlook grammatical markers if they perceive them as non-essential to understanding, which leads to persistent form-meaning mismatches. To address this issue, PI is designed to help learners make accurate form-meaning connections through carefully structured input activities (Khemani et al., 2024; Xie et al., 2025).

As opposed to traditional explicit grammar instruction, which relies on output-based exercises like drills and sentence formation, PI avoids forcing learners to produce the target structure prematurely. Instead, learners are exposed to "structured input" tasks that require them to process the grammatical form in order to interpret meaning correctly. These tasks are not only meaningful but are also crafted to push learners away from default processing strategies that may interfere with correct form acquisition (Ellis et al., 2019; Myers et al., 2024).

2.2 PI and Speaking Skills: A Bridge to Communicative Competence

Although originally conceived to improve grammatical accuracy in comprehension, PI has important implications for speaking skills and communicative competence (Collins et al., 2011). By strengthening learners' internalization of grammar and form-meaning associations, PI lays a strong cognitive foundation for accurate and fluent speech production. This is particularly significant for non-English major students, who often struggle with spontaneous language use due to limited exposure to real-life communication in English (Hirotani & Fujii, 2019).

Studies have shown that learners who undergo PI demonstrate improved confidence, reduced anxiety, and greater motivation, all of which are critical affective components of speaking fluency (He et al., 2019). Furthermore, PI enhances learners' ability to process and respond to language in real time, a skill essential for effective spoken interaction (Shirinbakhsh et al., 2018).

2.3 Previous Studies on PI: Focus on Grammar, Less on Speaking

Most of the empirical research on PI has focused on its effects on grammatical acquisition, particularly in recognizing and interpreting tense, aspect, word order, and morphological markers. For example, PI has been shown to outperform traditional grammar instruction in improving learners' understanding of English past tenses and derivational affixes (Hamavandy & Golshan, 2015; Hirotani & Fujii, 2019).

However, there remains a notable gap in the literature regarding PI's application in the development of oral language production. While a few studies hint at improvements in confidence and output quality as a result of PI-based activities, comprehensive investigations into its direct impact on speaking proficiency especially among non-English major students are scarce. Most existing studies are short-term, grammar-focused, and do not measure spontaneous speaking outcomes or real-world communicative performance (Mahmoudi-Gahrouei et al., 2020).

2.4 Rationale for a Bibliometric Approach

Given the fragmented nature of the research and the emerging interdisciplinary interest in PI, a bibliometric approach is ideal for gaining a structured overview of the field. Bibliometric analysis allows researchers to objectively assess publication trends, citation patterns, authorship networks, and conceptual clusters, offering a macroscopic perspective that is not achievable through traditional literature reviews. This methodology helps in identifying thematic hotspots, tracking the evolution of research foci (e.g., grammar to speaking), and uncovering underexplored domains such as the pedagogical application of PI in speaking instruction. In fields like applied linguistics and language pedagogy where studies are often context-specific and methodologically diverse -bibliometric tools provide clarity by mapping the scholarly landscape and revealing global research trajectories (Nurjati et al., 2024). Four research questions have been raised, as follows:

1. What is the growth trajectory of PI and its impact on speaking skill enhancement journal articles throughout the 26-year period covered in this study (2000 - 2025)?

2. Which documents, authors, journals, and countries/regions of origin are the most influential in terms of total journal articles and citations?

3. What are the most frequently explored PI and its impact on speaking skill enhancement themes and topics?

4. What are the potential trends in the field?

3. Methodology

The bibliometric study was conducted using scientific output data extracted from Elsevier's Scopus database as shown in Figure 1. The search utilized the advanced search function, applying the following logic operation:

(TITLE-ABS-KEY ("processing instruction" OR "input-based instruction" OR "input processing" OR "speaking skills" OR "oral proficiency" OR "communicative competence" OR "non-English majors" AND "EFL learners" OR "language students")) AND (LIMIT-TO (PUBYEAR > 2000 AND PUBYEAR < 2025)) AND (LIMIT-TO (LANGUAGE , "English")).This search query was specifically designed to retrieve relevant and high-quality records based on the occurrence of selected keywords in the title, abstract, or author's keywords, while excluding unrelated content indexed through keywords-plus or other automated keyword indexing (Zhang et al., 2025). The query was refined to ensure a focus on research pertaining to input-based language instruction and oral proficiency development

among EFL learners, particularly in non-English majors or general language student populations.

The timespan considered for this study ranged from 2000 to 2025, allowing for a comprehensive analysis of the evolution of research in this area over more than two decades. The document types were limited to peer-reviewed articles and reviews published in English, yielding a total of 542 documents for analysis.

The bibliometric data retrieved from Scopus were exported and subsequently analyzed using VOSviewer© software (Nwaichi et al., 2025a; Nwaichi et al., 2025b). This tool enabled the construction of various visual bibliometric maps, including author co-authorship networks, country collaborations, journal co-citation analysis, and keyword co-occurrence clustering. These visualizations helped identify key contributors, influential sources, and emerging thematic trends within the research landscape of input-focused language instruction and communicative competence in EFL contexts.

Through the use of VOSviewer, keyword clusters were generated to illustrate the conceptual structure of the field, revealing prominent themes such as "processing instruction and grammar acquisition", "oral fluency and classroom interaction", and "communicative strategies in EFL learning". Author networks also highlighted central figures and collaborative patterns, offering insight into scholarly influence and connectivity.
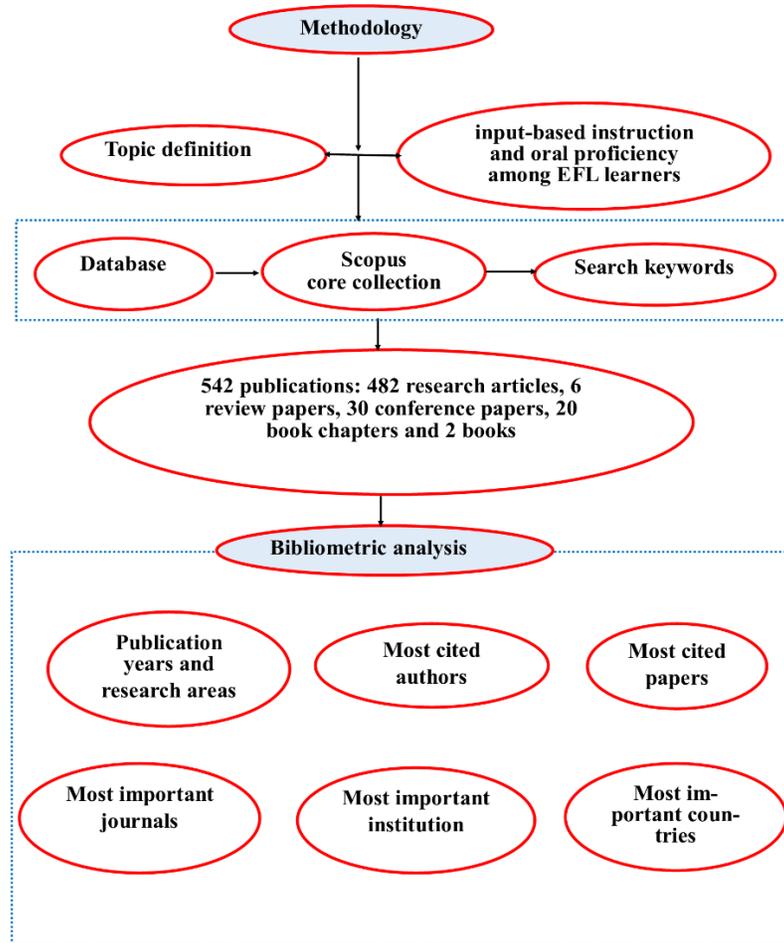

Figure 1. Flowsheet of the steps for literature search and bibliometric analysis

In addition, the most cited publications within the dataset were examined to understand their impact and relevance in shaping discourse and pedagogical approaches in the teaching of speaking skills and input processing for EFL learners. These highly cited works serve as pivotal references that inform both theory and classroom practice in applied linguistics and second language acquisition.

All data used in this bibliometric analysis were sourced directly from the Scopus database and reflected the publication and citation trends related to input-based instructional strategies and oral language development among EFL learners from 2000 to 2025.

4. Results

The results of the bibliometric study on input-based instruction and oral proficiency among EFL learners were presented in the following sections, indicating the most prominent research areas, keywords, affiliations, journals, authors, and countries. Each part of the results was

discussed to reveal research progress, trends, updates, and hotspots concerning instructional strategies and communicative competence development in EFL contexts.

4.1 Publication Evolution and Research Areas

Figure 2 shows the evolution of the publications between 2000 and 2025. From the literature search**,** 542 Documents: 482 research articles, 6 review papers, 30 conference papers, 2 conference review papers, 20 book chapters, and 2 books. It was observed that in the early 2000s, the number of publications in this research domain remained relatively low. However, beginning around 2010, a gradual and consistent rise in scholarly output can be seen, with a notable surge in publications in the most recent years (2020-2025). This trend reflects a growing academic interest in input-based instruction and the development of oral proficiency and communicative competence among EFL learners, likely influenced by the increased emphasis on effective second language teaching methodologies and learner research centered pedagogy in global education. The publications were further classified into the top areas, affiliations, countries, journals, and authors (Table 1). The most prominent subject categories included Social Sciences, Arts and Humanities, and Linguistics and Language, underlining the interdisciplinary nature of this field and its relevance in both educational research and language pedagogy. The rise in these areas suggests a broadening of the academic conversation around evidence-based language instruction, reflecting an evolving and dynamic research landscape.
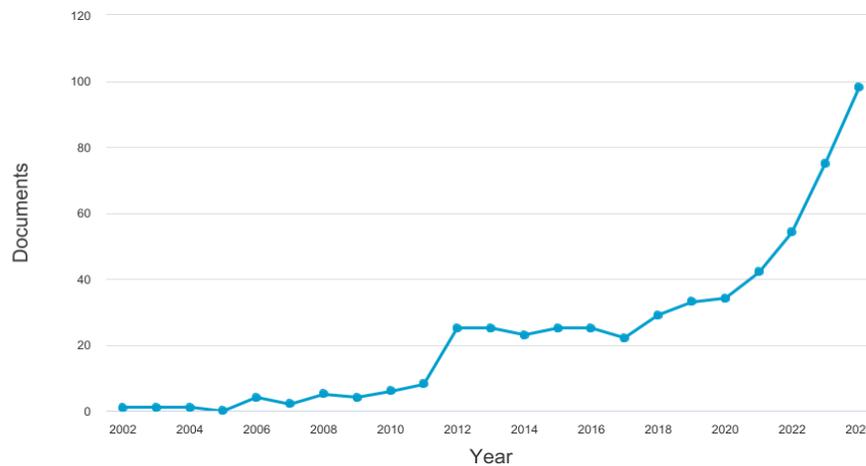

Figure 2. Evolution of the number of publications over the years (2000 to 2025) in Speaking Skills Enhancement for Non-English Major Students

4.2 Publication Trends by Document Type, Authors, Countries, and Affiliations

To better understand the evolution of scholarly output in the field of speaking skills enhancement and input-based instruction among EFL learners, multiple trends were analyzed over a 26-year period (2000-2025). Figure 3 illustrates the trends in document types by author, highlighting individual contributors' publication patterns and preferences for article, review, or conference formats. Figure 4 presents the overall trends in document types, capturing the growth and distribution of various publication formats over time. Figure 5 visualizes the trends in document types by country, shedding light on national contributions to the field and regional publishing dynamics. Lastly, Figure 6 shows the trends in document types by affiliation, identifying the institutions most active in producing research within this domain. Collectively, these figures offer valuable insight into the field's development, the diversity of contributions, and key academic stakeholders driving the discourse.
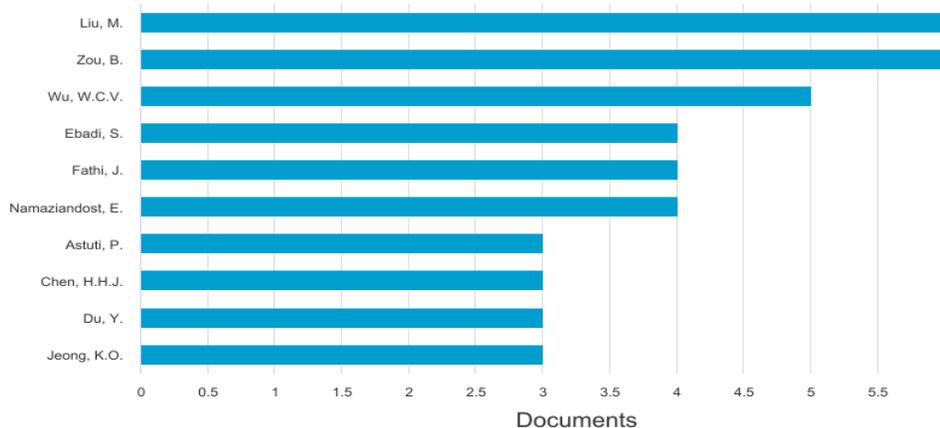
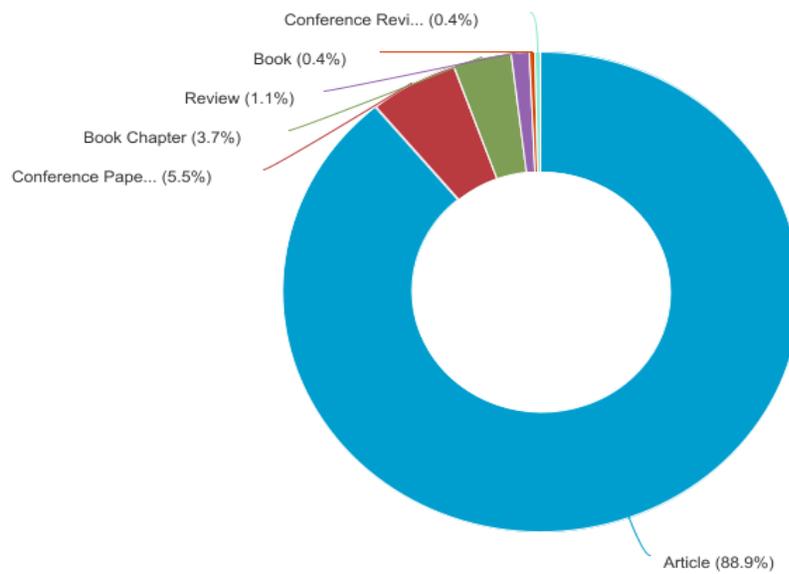Figure 3. Trends in Document Types by Author (2000-2025)

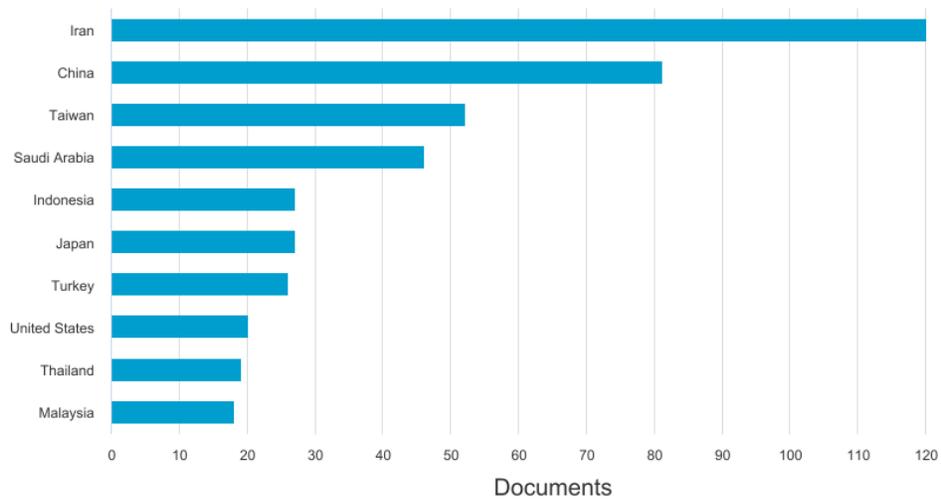Figure 4. Trends in Document Types (2000–2025)

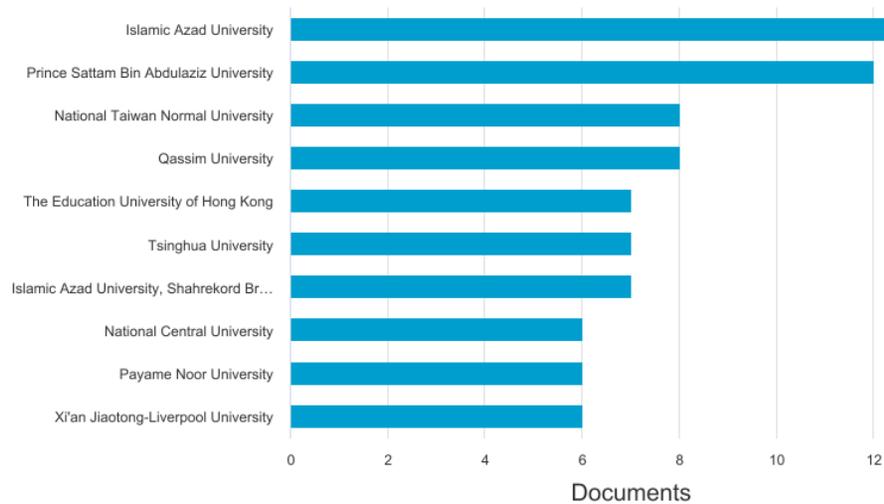Figure 5. Trends in Document Types by country (2000-2025)

Figure 6. Trends in Document Types by affiliation (2000-2025)

The bibliometric analysis revealed that the most frequently used keywords in the research field emphasize communicative aspects of English as a Foreign Language (EFL). Terms such as "EFL learners," "speaking skills," "communicative competence," and "motivation" appeared prominently, indicating that oral proficiency and learner engagement are core themes in this field. Additionally, the appearance of keywords like "intercultural communicative competence" and "willingness to communicate" suggests a growing interest in sociocultural and psychological dimensions of language learning. These trends align with pedagogical shifts emphasizing learner-centered approaches and the development of real-world communication skills.

4.3 Bibliometrics of Authors, Journals, Institutions, and Countries

The bibliometric analysis reveals the most prolific contributions to the field. Among authors, Tuan L.T. and Jeong K.-O. emerged as the top contributors, each with three publications. Other notable contributors with two publications include Abduh M.Y., Chwo G.S.-M., and Zhu W.. This concentration of output among a few key authors suggests a relatively small group of leading voices repeatedly engaging in research within the field.

From a journal standpoint, the most prominent platforms for dissemination are Theory and Practice in Language Studies (21 publications) and the Journal of Language Teaching and Research (20 publications), followed by the International Journal of Applied Linguistics and English Literature (17). This indicates that researchers in this domain prefer to publish in specialized journals focused on language education and applied linguistics.

Institutional and geographic analysis shows a strong presence from Iranian universities, particularly the Islamic Azad University and University of Kurdistan. Taiwan and China also host several high-output institutions such as National Central University. In terms of country-wise output, Iran leads with 160 contributions, followed by China (117), Taiwan (78), and Saudi Arabia (54). This distribution suggests that research in this field is heavily concentrated in Asian countries, likely reflecting regional academic priorities in English language education and technology-assisted learning.

4.4 Top 10 Most Cited Articles in the Field

The most cited work in the dataset is by Liu & Jackson (2008), titled "An exploration of Chinese EFL learners' unwillingness to communicate and foreign language anxiety", published in the Modern Language Journal with 396 citations (M. Liu & Jackson, 2008). This paper investigates psychological barriers in language learning, highlighting how anxiety can suppress student communication (Liu & Jackson, 2008). The second most cited article is Han & Hyland (2015)'s study on learner engagement with written corrective feedback in the Journal of Second Language Writing with 269 citations. It explores how students interact with teacher feedback, which has implications for writing pedagogy (Han & Hyland, 2015). Lee (2022) also contributes significantly with 174 citations for his research on the role of grit and enjoyment in English as a Foreign Language (EFL) learning (Lee, 2022).

Other notable articles include studies on online and flipped learning environments such as Wu et al. (2017) on online communities in flipped instruction (164 citations) (Wu et al., 2017), and Chen Hsieh et al. (2017) ONLINE-based learning (112 citations) (Chen Hsieh et al., 2017). Also prominent are studies on learner demotivation (Falout et al., 2009), oral communication strategies (Nakatani, 2006), and speaking anxiety (Chou, 2018). These highly cited works reflect diverse methodological and theoretical approaches, signaling rich academic engagement in motivation, affect, and digital pedagogy.

Table 1 lists the top 20 most frequently used keywords supporting the earlier discussion of dominant themes while Table 2 identifies the top 10 most cited research articles, giving insight into influential studies shaping the discourse. Together, these analyses provide a comprehensive overview of publication trends, thematic concentrations, and scholarly impact in the EFL domain. The top 20 most frequently occurring keywords in the dataset suggest a strong focus on English as a Foreign Language (EFL), with an emphasis on speaking skills, motivation, and intercultural competence. This research field appears centered around enhancing oral communication and language proficiency among EFL learners, particularly in speaking and intercultural competence contexts. Keywords such as "motivation" and "willingness to communicate" suggest a psychological and pedagogical lens in many studies.

Table 1. Top 20 Keywords by Occurrence

Rank	Keyword	Occurrences
1	EFL learners	56
2	EFL	43
3	speaking skill	39
4	communicative competence	35
5	speaking skills	33
6	speaking	28
7	students	26
8	oral proficiency	24
9	motivation	23
10	intercultural communicative competence	22
11	willingness to communicate	20
12	language learning	18
13	fluency	17

14	english-as-a-foreign-language	15
15	e-learning	14
16	chinese efl learners	13
17	teaching	13
18	english as a foreign language	12
19	processing instruction	12
20	accuracy	12

These highly cited studies represent foundational work in EFL research, with recurring themes of learner psychology, motivation, technology integration, and speaking competence.

Table 2. Top 10 Most Cited Articles in the Field

Rank	Title	Authors	Year	Journal	Citations
1	An exploration of Chinese EFL learners' unwillingness to communicate and foreign language anxiety	Liu & Jackson	2008	Modern Language Journal	396
2	Exploring learner engagement with written corrective feedback in ESL classrooms	Han & Hyland	2015	Journal of Second Language Writing	269
3	The role of grit and classroom enjoyment in EFL learners' willingness to communicate	Lee	2022	Journal of Multilingual and Multicultural Development	174
4	Creating an online learning community in a flipped EFL classroom: A social network perspective	Wu, Hsieh & Yang	2017	Educational Technology and Society	164
5	Demotivation: Affective states and learning outcomes	Falout, Elwood & Hood	2009	System	162
6	Developing an oral communication strategy inventory	Nakatani	2006	Modern Language Journal	130
7	Fine brush and freehand: The vocabulary-learning art of beginning Chinese learners	Gu	2003	TESOL Quarterly	119
8	Technological acceptance of LINE in flipped EFL speaking classrooms	Chen Hsieh, Huang & Wu	2017	Computers in Human Behavior	112
9	Speaking Anxiety and Strategy Use for Learning English as a Foreign Language in China	Chou	2018	TESOL Quarterly	110
10	Improving EFL learners' speaking skills and willingness to communicate through podcasting	Fathi, Rahimi & Derakhshan	2024	System	95

4.5 Bibliometric Trends Supporting the Study

The bibliometric analysis of 542 Scopus-indexed publications (2000-2025) sheds light on the research evolution and thematic focus in the domain of speaking skills enhancement for EFL learners, with specific attention to non-English majors and input-based instructional approaches. A notable rise in publications after 2010 reflects the expanding academic interest in communicative competence and oral proficiency, underscoring the urgency of improving speaking abilities in EFL contexts. High-frequency keywords such as "speaking skills," "oral proficiency," "EFL learners," and "processing instruction" indicate strong research alignment with this study's focus. Moreover, the prominence of terms like "input-based instruction" and "communicative competence" in keyword clusters suggests that the research community increasingly values comprehension-driven pedagogies over production-first models. The institutional and geographical analysis reveals significant contributions from Asian academic institutions, highlighting a regional focus on addressing the linguistic challenges faced by non-English majors. The findings substantiate the relevance of PI as an emerging method and reinforce this study's objective of examining its effectiveness in enhancing speaking skills (Chang & Kwan, 2012; Chiu et al., 2007; Gorsuch & Taguchi, 2010). By grounding the research in current bibliometric trends, this study is positioned within a timely and growing discourse that seeks to modernize language instruction through data-informed, learner-centered strategies (Nakatani, 2006; Tuan, 2012).

4.6 Visualizing Research Trends and Collaboration Networks

To gain a deeper understanding of the thematic structure and intellectual landscape of research on speaking skills enhancement and input-based instruction among EFL learners, a series of keyword and author visualizations were generated using VOSviewer software (Elihami et al., 2025). Figure 7 presents the network visualization of keywords, illustrating co-occurrence relationships and thematic groupings that reveal dominant and emerging concepts in the field. Figure 8 provides the overlay visualization of keywords, highlighting temporal trends by displaying how the relevance of certain keywords has evolved over time. Figure 9 offers a density visualization of keywords, where areas of greater keyword concentration indicate hotspots of research activity. Lastly, Figure 10 depicts the network visualization of authors, showing collaborative networks and identifying leading contributors to the discourse. Together, these visualizations provide a comprehensive overview of the field's development, focal points, and scholarly collaboration patterns.
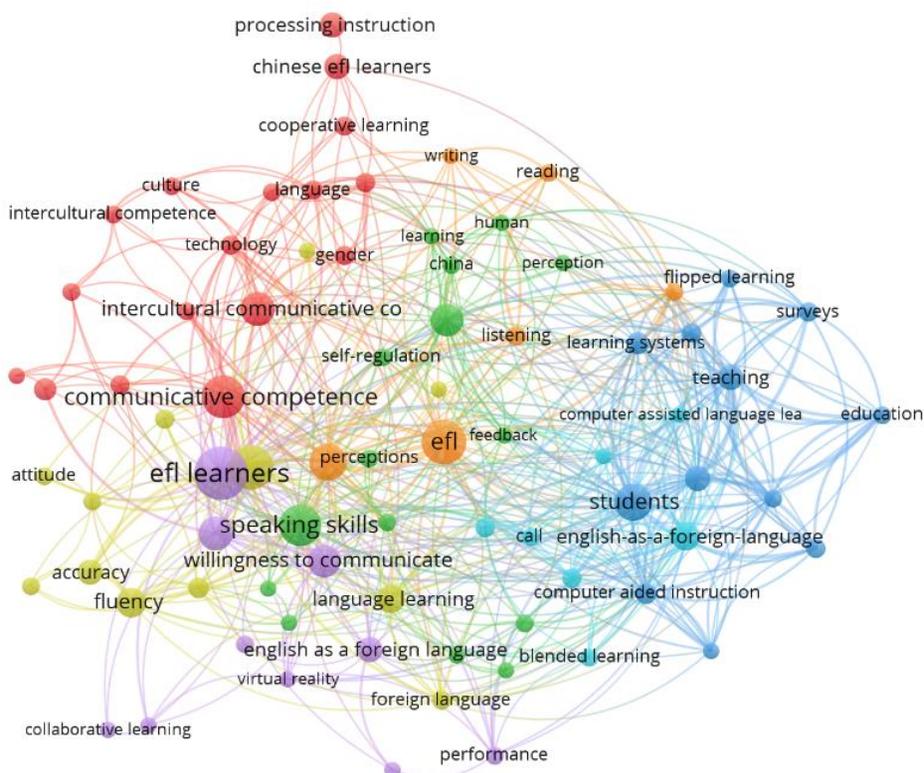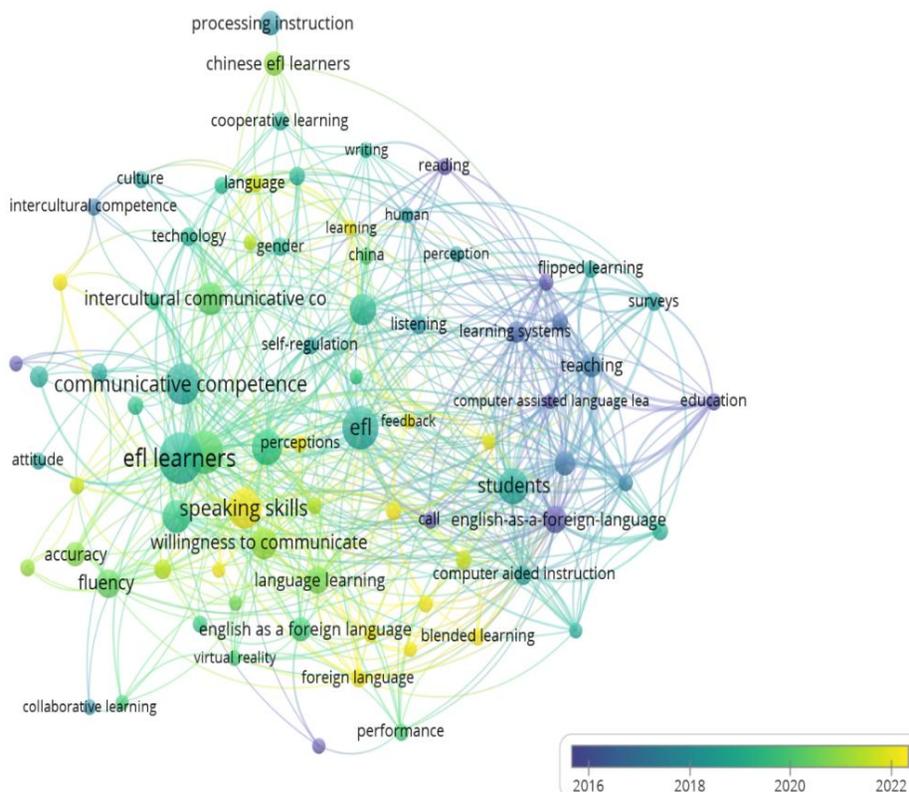
Figure 7. Network visualization of Keywords
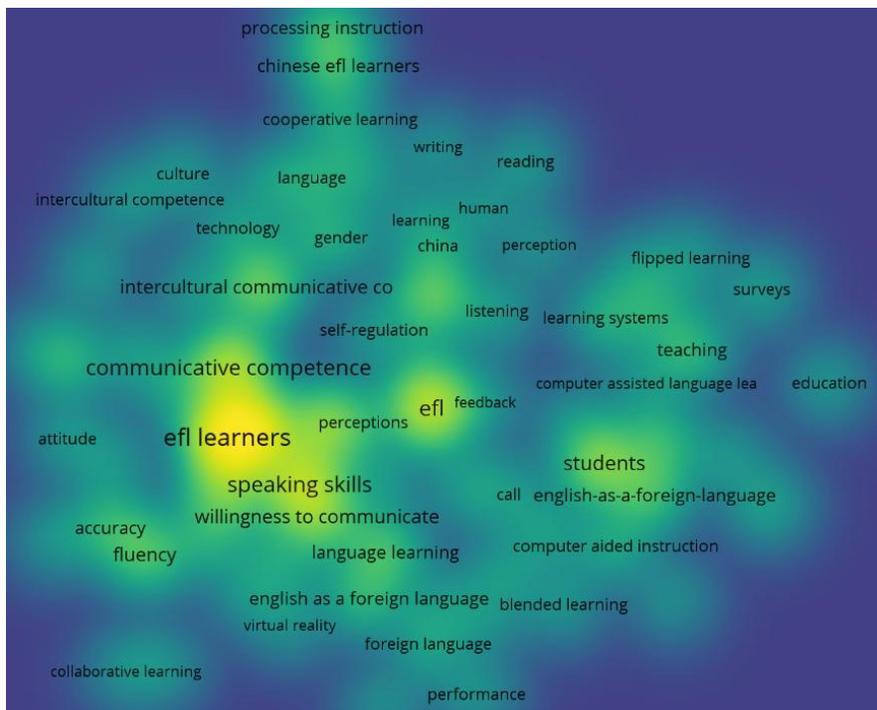

Figure 8. Overlay visualization of Keywords

Figure 9. Density visualization of Keywords

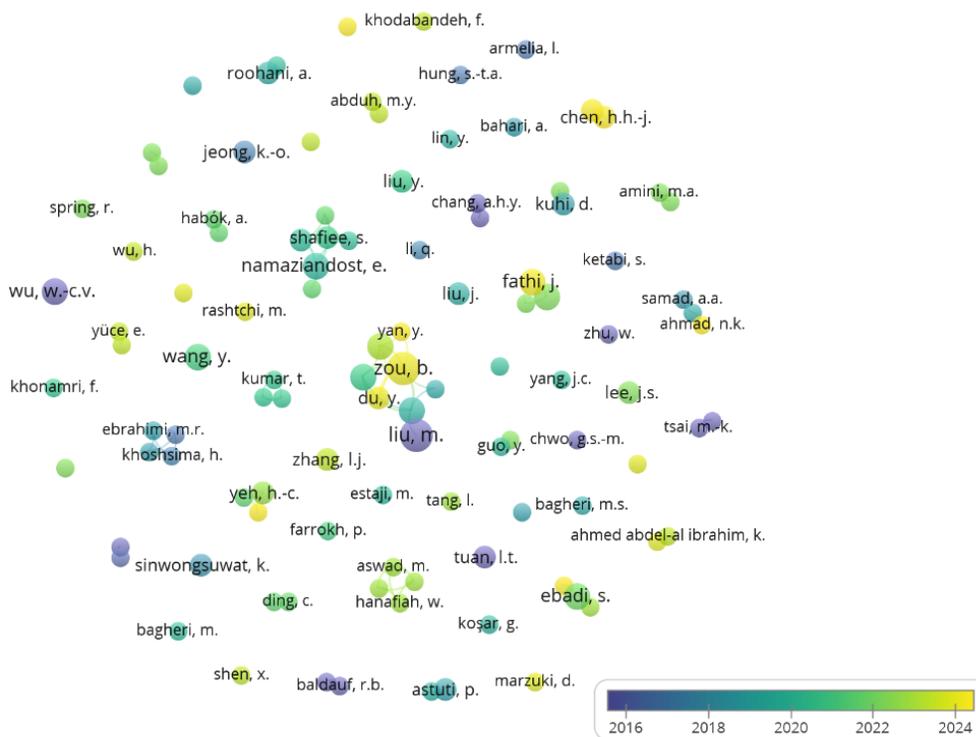Figure 10. Network visualization of authors

5. Discussion

5.1 Processing Instruction and Speaking Skills: A Synthesis of Key Studies

PI was initially developed as an input-focused alternative to grammar-based teaching (Falout et al., 2009; Turula, 2011), however, recent

empirical studies increasingly highlight its relevance for oral language development, particularly for non-English major students who require strong comprehension foundations before engaging in spoken production. Key empirical findings are on the intersection between PI and speaking proficiency, drawing on research that explores three interrelated dimensions: cognitive processing, affective engagement, and communicative responsiveness (Gorsuch & Taguchi, 2010; Malone & Montee, 2010; Nakatani, 2006). PI can serve as an indirect but powerful catalyst for speaking fluency, particularly when it is integrated into learner centered classroom practices. Studies suggest that by reducing cognitive overload during speech production, PI allows learners to allocate greater attentional resources to meaning negotiation and interactional management. Moreover, affective benefits associated with PI such as increased confidence, reduced speaking anxiety, and enhanced willingness to communicate have been identified as key mediating factors in oral proficiency development, especially for learners with limited exposure to authentic English use. Collectively, these findings indicate that while PI does not target speaking directly, its input-processing mechanisms create essential preconditions for effective and confident spoken communication.

5.1.1 Cognitive Outcomes: Internalizing Grammar for Accurate Speech

At its core, PI strengthens form-meaning connections, which are essential for both comprehension and production. Several studies have shown that learners exposed to PI perform better at recognizing grammatical structures such as derivational affixes, past tenses, and subject-verb agreement compared to those taught through traditional deductive methods ("2010 2nd International Conference on E-Learning and E-Teaching, ICELET 2010," 2010; Pachler & Allford, 2004). This enhanced grammatical sensitivity supports more accurate mental representations of language, which are crucial for fluent and spontaneous speech production.

For instance, (Chan, 2019; Zeng et al., 2024) found that PI significantly improved EFL learners' ability to recognize and comprehend derivational affixes, a skill linked to lexical and grammatical accuracy in speaking. While the study's primary focus was not oral output, learners in the PI groups reported greater confidence in word formation, reduced hesitation during speech, and improved clarity in spoken expression, compared to control groups. Similarly, (Birjandi et al., 2011; Hassanzadeh & Shahbazi, 2021; Lai, 2024; Modirkhamene et al., 2018) demonstrated that PI effectively improved learners' grasp of English past tenses, which has direct implications for the accuracy and coherence of verbal storytelling, narration, and time-sensitive spoken interaction. Compared with traditional grammar instruction, PI-based learners were better able to retrieve tense forms during real-time communication, suggesting a closer alignment between comprehension-based learning and oral performance.

In contrast, traditional grammar instruction, which typically emphasizes explicit rule explanation followed by mechanical practice, often fails to support learners' ability to access grammatical forms during spontaneous speech. Learners in deductive instructional settings may demonstrate explicit knowledge of grammatical rules yet struggle to apply this knowledge under communicative pressure. PI-based instruction, by prioritizing comprehension-driven processing before production, appears to facilitate more automatic retrieval of grammatical forms during oral interaction. This distinction is particularly relevant for non-English major students, whose limited exposure to communicative practice makes efficient form–meaning processing a critical prerequisite for fluent and accurate speaking.

5.1.2 Affective Benefits: Lower Anxiety, Higher Motivation

A recurring theme in PI-related research is its positive emotional impact on learners. By removing the immediate pressure to produce output and emphasizing comprehension, PI creates a low-anxiety learning environment a critical factor for non-English majors who often struggle with speaking confidence. In (Qin, 2008; Wijaya & Djasmeini, 2017), learners reported greater enjoyment and self-confidence during the learning process compared to peers in output-focused instruction. This affective boost contributes indirectly to speaking proficiency by increasing learners' willingness to communicate in class. In contrast to traditional output-driven approaches, which may heighten performance anxiety and fear of error, PI allows learners to engage with language meaningfully without the stress of immediate evaluation. This reduction in affective barriers enables learners to process linguistic input more deeply and prepares them cognitively for later oral production. The affective benefits of PI are especially relevant in contexts like Vietnam and Iran, where large classroom sizes and limited speaking practice time make learners hesitant to participate. These findings align with (Birjandi et al., 2011; Hashemnezhad & Zangalani, 2012; Naami & Sahragard, 2022), which emphasized the importance of learner confidence and motivation in developing speaking proficiency among non-English majors.

Taken together, these studies suggest that PI contributes to speaking development not only through cognitive mechanisms but also by fostering positive emotional conditions that support sustained oral engagement. This dual cognitive-affective role represents an important yet often underemphasized contribution of PI to EFL speaking instruction.

5.1.3 Pragmatic Competence: Improving Real-Time Communication

More recent studies have begun exploring the effects of PI on pragmatic aspects of speech, such as speed, appropriateness, and fluency. In a notable study by (Baleghizadeh & Saharkhiz, 2014; Haghani & Rashtchi, 2023), input-based instruction (modeled after PI) was compared to metapragmatic instruction in teaching English refusals. While both approaches improved learners' accuracy, the PI group significantly outperformed the other in response speed and spontaneous production, indicating that PI may be effective in developing real-time communicative skills (Koranian et al., 2016). Unlike metapragmatic instruction, which relies heavily on explicit explanation of sociolinguistic rules, PI emphasizes comprehension-driven exposure that encourages automatic processing of pragmatic cues. This instructional difference appears to support faster access to appropriate language forms during interaction, a key requirement for real-time communication. These results suggest that PI contributes not only to grammatical accuracy but also to pragmatic fluency, helping learners produce speech that is both correct and contextually appropriate an essential component of communicative competence (Hamavandy &

Golshan, 2015; Salimi & Shams, 2016). For non-English major students, who often lack opportunities for extended interaction in English, the ability to respond promptly and appropriately is particularly critical. The emerging focus on pragmatic outcomes in PI-related research therefore represents a meaningful shift from form-focused accuracy toward functional communicative competence, highlighting a promising direction for future PI-based speaking instruction.

5.1.4 Classroom Applications for Non-English Majors

Practical applications of PI have proven particularly useful in contexts where students face multiple barriers to oral proficiency such as limited instructional hours, test-oriented curricula, and low exposure to English outside the classroom (Cetereisi et al., 2020; Y. Liu, 2024). (Astuti & Barratt, 2018)integrated structured input tasks into a CLIL-based speaking module for non-English major high school students in Indonesia. The results showed improvements in both content knowledge and oral expression, supporting the idea that PI can be tailored to diverse instructional settings. Compared to conventional speaking instruction that prioritizes immediate output, PI-based classroom applications emphasize preparatory comprehension stages that allow learners to internalize linguistic forms before engaging in oral tasks. This instructional sequencing appears particularly effective for non-English majors, who often require additional processing time to build confidence and accuracy in spoken communication. Additionally, combining PI with multimodal activities such as video-based input, oral role-play, and flipped classroom strategies has been shown to amplify speaking outcomes (Chen, 2012).

These findings suggest that PI is not a rigid methodology but a flexible pedagogical framework that can be adapted to various instructional models, including CLIL, blended learning, and technology-enhanced classrooms. By aligning structured input with communicative practice, PI-based applications help bridge the gap between comprehension and production, offering a practical pathway for improving speaking proficiency in resource-constrained EFL contexts. This adaptability represents a key contribution of PI to contemporary EFL pedagogy and underscores its relevance for non-English major instruction.

5.2 Pedagogical Implications

The growing body of research supporting PI presents a valuable opportunity for language educators to rethink traditional approaches to developing speaking skills, especially among non-English major students (Leonet & Saragueta, 2024; Zhao & Liu, 2019). The findings from the bibliometric and empirical review suggest that PI can significantly enhance the foundational competencies that enable confident, fluency, and grammatically accurate oral communication. This section outlines the key instructional implications of incorporating PI into speaking-focused curricula and discusses how teachers can practically implement this approach in diverse EFL contexts (Jiang et al., 2022; Yan et al., 2024).

First, instructors are encouraged to prioritize structured input activities during the initial stages of speaking instruction, allowing learners to develop strong form–meaning connections before being required to produce oral output. This sequencing can reduce cognitive overload and speaking anxiety, particularly for non-English majors with limited communicative experience. Second, PI can be effectively integrated with communicative and task-based approaches rather than replacing them. Once learners have internalized target structures through structured input, teachers can design interactive speaking tasks that promote meaningful use of language in authentic contexts. This blended approach helps bridge the gap between comprehension and production. Third, teacher training and curriculum design should emphasize flexibility in PI implementation. Educators can adapt PI principles to various instructional formats, including CLIL, blended learning, and technology-enhanced classrooms, ensuring alignment with institutional constraints and learner needs.

Finally, the pedagogical implications of PI extend beyond grammatical accuracy to include affective and pragmatic dimensions of speaking. By fostering learner confidence, motivation, and real-time communicative responsiveness, PI contributes holistically to oral proficiency development. These implications highlight the value of PI as a learner-centered and cognitively grounded approach to EFL speaking instruction.

5.2.1 Integrating PI into Speaking Instruction

Although PI was originally designed to improve grammatical comprehension through structured input, its principles can be effectively extended to speaking-oriented instruction. One practical strategy is to embed PI activities in the pre-speaking stage of a lesson. For example, before asking students to perform a dialogue or role-play, teachers can first guide them through structured input tasks that expose the target grammar in meaningful contexts. This ensures that learners notice and process essential forms before attempting to produce them(Alghmadi, 2024; Michos & Zorbas, 2023). By frontloading comprehension in this way, learners are better prepared to engage in spoken interaction with greater accuracy and confidence. This approach aligns with PI's core assumption that effective production depends on successful input processing rather than immediate output practice.

This input-first approach is particularly beneficial in large or mixed-ability classrooms, where many students may feel apprehensive about speaking without adequate support. Teachers can scaffold instruction by gradually moving from input comprehension **to** guided output, thus reducing learner anxiety and increasing the likelihood of successful performance (Alshakhi, 2024; Yen et al., 2013).

Furthermore, integrating PI into speaking instruction encourages teachers to reconceptualize speaking lessons as a process rather than a single performance task. By sequencing activities from structured input to controlled speaking and finally to freer communicative practice, instructors can create a supportive learning environment that accommodates diverse proficiency levels. This pedagogical sequencing is especially advantageous for non-English major students, whose limited exposure to English necessitates careful instructional scaffolding.

5.2.2 Supporting Fluency Through Comprehension

A common assumption in language teaching is that fluency comes only from repeated speaking practice (Tran et al., 2024). However, PI offers an alternative by emphasizing that accurate internalization of language structures via input is a necessary precondition for fluent output. Teachers can design structured input activities that simulate real-life communicative situations (e.g., choosing the correct response based on contextual clues), thereby training learners to process speech in ways that later support fluency in spontaneous speaking (Hassaskhah et al., 2015; Spring, 2020). For instance, incorporating structured input exercises that require form-meaning connections like choosing the correct sentence based on a visual cue or interpreting oral instructions helps students process grammatical cues that they can later apply in real conversations (Derakhshan et al., 2016; Roohani & Etemadfar, 2021).

In addition, this comprehension-first approach allows learners to automate recognition of target structures, reducing cognitive load during actual speaking tasks. By internalizing language patterns through meaningful input, students can allocate more attention to content, interactional strategies, and pragmatic appropriateness in real-time communication. This approach is particularly valuable for non-English major students, who often face anxiety and hesitation when required to speak spontaneously. Structured input activities not only build accuracy and form recognition but also indirectly enhance speaking speed, coherence, and confidence, demonstrating that fluency is supported by cognitive preparation as well as output practice. Therefore, integrating comprehension-focused PI activities into speaking instruction provides a bridge between receptive knowledge and productive competence, reinforcing the idea that fluent and confident oral performance is grounded in well-processed input.

5.2.3 Addressing Affective Barriers in Speaking

Non-English majors often face affective challenges such as fear of making mistakes, low self-confidence (Zúñiga et al., 2023), and lack of motivation. One of PI's strengths is that it minimizes the demand for immediate output, giving students time to build competence through comprehension. This reduces speaking anxiety and fosters a safer learning environment where students feel more comfortable taking risks. In contrast, traditional output-focused instruction often exposes learners to high-pressure speaking situations before they have internalized linguistic forms, which can exacerbate anxiety and reduce willingness to communicate. PI's first approach provides a scaffolded pathway that allows students to gradually gain control over language structures while simultaneously building affective readiness for oral participation.

Educators are encouraged to pair PI with confidence-building tasks such as collaborative learning, peer feedback, and non-threatening speaking activities (e.g., recorded responses instead of live performance). In doing so, teachers can gradually transition students from input processing to speaking practice in a psychologically supportive way (Hashemifardnia et al., 2021; Yenkimaleki & van Heuven, 2023). Furthermore, integrating affective scaffolds with PI can have compounding benefits: as learners experience repeated successes in comprehension-based tasks, their self-efficacy and motivation increase, which in turn facilitates more fluent, spontaneous, and accurate spoken output. This dual cognitive-affective pathway underscores PI's holistic contribution to developing speaking proficiency among non-English majors, highlighting its potential as both a linguistic and motivational intervention in EFL classrooms.

5.2.4 Digital and Multimodal Extensions of PI

Modern classrooms increasingly incorporate digital tools that are highly compatible with PI. For instance, video-based structured input can be used to present real-world dialogues or situational contexts, allowing students to focus on listening and comprehension before engaging in speaking tasks (Nasim et al., 2022; Zhang & Liu, 2023). Similarly, flipped learning models allow students to process input outside of class (through videos, quizzes, etc.), freeing classroom time for guided speaking practice (Ajideh et al., 2024; Pardo, 2014; Shen et al., 2024). This multimodal integration is especially useful for non-English majors, who may have limited instructional hours. Teachers can assign structured input tasks as homework and follow up with interactive speaking exercises in class, achieving a balanced input-output sequence that reinforces both comprehension and production (Busso & Sanchez, 2024; Muñoz-Alcón et al., 2023; Tatlı et al., 2022).

In addition, digital and multimodal tools can enhance the effectiveness of PI by providing richer, more contextualized input that mirrors authentic language use. For example, video-based scenarios allow learners to observe nonverbal cues, intonation patterns, and pragmatic conventions, which are often missing in textbook-based instruction. This exposure supports both cognitive and pragmatic aspects of speaking, helping learners transfer comprehension to real-time communication.

Moreover, integrating structured input with digital platforms enables adaptive and individualized learning. Learners can process input at their own pace, revisit challenging segments, and receive immediate feedback through quizzes or interactive exercises. This flexibility not only reinforces form-meaning connections but also reduces affective barriers such as anxiety, making speaking practice more accessible and effective for non-English majors. Taken together, these digital and multimodal extensions position PI as a versatile and future-ready pedagogical framework, capable of supporting speaking proficiency in diverse instructional contexts while addressing cognitive, affective, and pragmatic dimensions of oral communication.

5.2.5 Curriculum and Teacher Training Implications

To implement PI successfully, language programs must support teacher training that emphasize: The theory and application of Input Processing, designing structured input tasks, managing transitions from input to output activities and Assessing comprehension-based progress. Effective implementation also requires ongoing professional development, peer collaboration, and reflective practice to ensure teachers can adapt PI principles to diverse classroom contexts and student needs. Incorporating PI into language teaching certification

programs and pre-service training curricula can better prepare educators to use this approach, particularly in regions where communicative teaching is still emerging(Woldetsadik et al., 2022).

Training should include practical modelling of PI lessons, demonstration of scaffolding techniques, and strategies for integrating digital or multimodal tools that enhance structured input activities. By equipping teachers with both theoretical knowledge and hands-on skills, programs can ensure that PI is implemented consistently and effectively, ultimately maximizing its impact on learners' speaking proficiency. Furthermore, curriculum designers should consider embedding PI principles across multiple course levels, not just isolated modules. This continuity allows learners to progressively internalize form-meaning connections, practice structured input, and gradually transition to autonomous speaking tasks, supporting sustained development of oral proficiency. Taken together, these curriculum and training considerations highlight the systemic changes necessary for PI to achieve its full potential, emphasizing that successful speaking instruction relies not only on innovative methodologies but also on well-prepared educators and thoughtfully structured programs.

5.3 Future Research Directions

Future research on PI should move beyond its well-established role in grammatical development to more directly examine its impact on speaking skills, particularly among non-English major students. Current studies overwhelmingly focus on comprehension gains, leaving unanswered questions about how PI supports spontaneous oral production. Future investigations should employ performance-based speaking assessments such as interviews, narrative tasks, and real-time communicative activities to determine whether learners can transfer form-meaning connections to fluent, accurate speech. Longitudinal designs and delayed post-tests are equally necessary to assess the durability of PI-related improvements and to understand whether structured input fosters sustained oral proficiency over time. Expanding research into underrepresented contexts, especially general education and vocational settings, will also provide deeper insight into how PI operates in classrooms where learners have fewer opportunities for authentic communication.

Another key direction involves exploring integrated or hybrid models that combine PI with output-oriented approaches such as Task-Based Language Teaching, CLIL, flipped instruction, or digital multimodal tools. Preliminary evidence suggests that such combinations may strengthen pragmatic fluency and improve real-time communication more effectively than PI alone. Future research should also investigate learner perspectives, examining how affective variables motivation, anxiety, self-efficacy, and attitudes toward English shape the success of PI-based speaking interventions. Mixed methods design incorporating interviews, learner journals, and classroom observations would offer a richer understanding of individual differences and learner engagement. Collectively, these lines of inquiry will help refine PI for speaking-focused pedagogy and support its application across diverse instructional environments.

6. Conclusion

This bibliometric and theoretical investigation confirms that PI is gaining global traction as a pedagogical strategy to enhance speaking proficiency, particularly among EFL contexts. The technical analysis of 542 Scopus-indexed documents reveals a steadily expanding research base, with significant contributions emerging from Iran, China, and Taiwan, and concentrated dissemination through specialized journals such as Theory and Practice in Language Studies and Journal *of Language Teaching and Research*. Notably, the most influential works in the field have addressed both linguistic outcomes and psychological constructs such as anxiety, motivation, and learner engagement underscoring the multidimensional appeal of PI. Authorial and institutional patterns also indicate the presence of growing but regionally concentrated scholarly communities driving PI research.

Thematically, the literature has evolved from early grammar focused explorations of PI to a broader embrace of its input-based mechanisms as tools for enhancing communicative competence. Citation patterns and keyword trends show increasing interest in integrating PI with technology enhanced learning, flipped classrooms, and affective scaffolding. Despite this progress, bibliometric data also highlight notable gaps particularly a scarcity of direct assessments of oral output, limited longitudinal studies, and underrepresentation of marginalized learner populations. This points to an urgent need for diversified research methodologies, especially those combining quantitative measures of fluency with qualitative insights into learner experience.

In summary, Processing Instruction stands out as a theoretically grounded and empirically supported approach for developing speaking skills in foreign language education. Its capacity to link form and meaning, reduce learner anxiety, and promote real time language use makes it especially suitable for non-English majors who often face both cognitive and emotional barriers to communication. When embedded within communicative tasks and supported by multimodal tools, PI can serve as a bridge from passive comprehension to active production. Moving forward, the strategic implementation of PI coupled with rigorous, inclusive research offers a promising pathway toward more effective, equitable, and communicatively rich language instruction in the multilingual classrooms of the 21st century.

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Authors' contributions

Zhang Yaqin**,** Wan Jumani Fauzi**,** and Hafizoah Kassim were responsible for the study design and critical revisions of the manuscript. Zhang Yaqin drafted and wrote the manuscript; Dr. Wan Jumani Fauzi coordinated data collection, verified the data and supervised the study; Dr. Hafizoah Kassim verified the data analysis and projected the whole study. All authors reviewed, edited, and approved the final

version of the manuscript.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

2010 2nd International Conference on E-Learning and E-Teaching, ICELET 2010. (2010). 2010 2nd International Conference on E-Learning and E-Teaching, ICELET 2010. Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-79952806177&partnerID=40&md5=43f2565364a6c45ff5a90ecea2d2e34a

Ajideh, P., Zohrabi, M., & Pour, R. M. (2024). The Effect of Global Digital Citizenship Education on Intercultural Communicative Competence and Learners' Perceptions. *Journal of Applied Linguistics and Applied Literature*, *12*(2), 59-86. https://doi.org/10.22049/jalda.2024.28957.1603

Alghmadi, K. A. (2024). Enhancing EFL Saudi university students' speaking proficiency through TED talks. *Journal of Pedagogical Research*, *8*(1), 159-171. https://doi.org/10.33902/JPR.202424730

Alshakhi, A. (2024). Speaking Skill Assessment Instrument Validity: An Investigation into Instructors' Perceptions. *Journal of Ecohumanism*, *3*(7), 4203-4217. https://doi.org/10.62754/joe.v3i7.4543

Amirjalili, F., & Jabbari, A. A. (2018). The impact of morphological instruction on morphological awareness and reading comprehension of EFL learners. *Cogent Education*, *5*(1), 1523975. https://doi.org/10.1080/2331186X.2018.1523975

Astuti, P., & Barratt, L. (2018). Individual accountability in cooperative learning in EFL classrooms: More opportunities for peer interaction. *Journal of Asia TEFL*, *15*(1), 1-16. https://doi.org/10.18823/asiatefl.2018.15.1.1.1

Baleghizadeh, S, & Saharkhiz, A. (2014). The impact of processing instruction on the recognition and production of English derivational affixes among EFL learners. *SAGE Open*, *4*(4). https://doi.org/10.1177/2158244014551930

Birjandi, P., Maftoon, P., & Rahemi, J. (2011). VanPatten's processing instruction: Links to the acquisition of the english passive structure by iranian EFL learners. *European Journal of Scientific Research*, *64*(4), 598-609. Retrieved from

https://www.scopus.com/inward/record.uri?eid=2-s2.0-81855166125&partnerID=40&md5=2e49806e509cc73cda4ae41a222d244b

Busso, A., & Sanchez, B. (2024). Advancing Communicative Competence in the Digital Age: A Case for AI Tools in Japanese EFL Education. *Technology in Language Teaching and Learning*, *6*(3). https://doi.org/10.29140/tltl.v6n3.1211

Cetereisi, Y., Bostanci, H. B., & Kurt, M. (2020). Classification of spoken errors regarding the communicative competencies. *Revista de Cercetare Si Interventie Sociala*, *68*, 128-144. https://doi.org/10.33788/rcis.68.9

Chan, M. (2019). The Role of Classroom Input: Processing Instruction, Traditional Instruction, and Implicit Instruction in the Acquisition of the English Simple Past by Cantonese ESL Learners in Hong Kong. *System*, *80*, 246-256. https://doi.org/10.1016/j.system.2018.12.003

Chang, A. H. Y., & Kwan, A. C. M. (2012). EFL students' perception of the use of text-to-speech synthesis in pronunciation learning. *Proceedings of the European Conference on E-Government, ECEG*, 524-527. Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-84870866955&partnerID=40&md5=990a4f6ee2f1fff9a1255ed717ab23a9

Chen Hsieh, J. S., Huang, Y.-M., & Wu, W.-C. V. (2017). Technological acceptance of LINE in flipped EFL oral training. *Computers in Human Behavior*, *70*, 178-190. https://doi.org/10.1016/j.chb.2016.12.066

Chen, M. L. (2012). Effects of integrating children's literature and DVD films into a college EFL class. *English Teaching*, *11*(4), 88-98. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84873474440&partnerID=40&md5=7251d3d3132afba71f26ffcd372337d7

Chiu, T. L., Liou, H. C., & Yeh, Y. (2007). A Study of web-based oral activities enhanced by Automatic Speech Recognition for EFL college learning. *Computer Assisted Language Learning*, *20*(3), 209-233. https://doi.org/10.1080/09588220701489374

Chou, M.-H. (2018). Speaking Anxiety and Strategy Use for Learning English as a Foreign Language in Full and Partial English-Medium Instruction Contexts. *TESOL Quarterly*, *52*(3), 611-633. https://doi.org/10.1002/tesq.455

Collins, L. G., Schrimmer, A., Diamond, J., & Burke, J. (2011). Evaluating verbal and non-verbal communication skills, in an ethnogeriatric OSCE. *Patient Education and Counseling*, *83*(2), 158-162. https://doi.org/10.1016/j.pec.2010.05.012

Derakhshan, A., Khalili, A. N., & Beheshti, F. (2016). Developing EFL Learner's Speaking Ability, Accuracy and Fluency. *English Language and Literature Studies*, *6*(2), 177. https://doi.org/10.5539/ells.v6n2p177

Diamond, L., Izquierdo, K., Canfield, D., Matsoukas, K., & Gany, F. (2019). A Systematic Review of the Impact of Patient–Physician Non-English Language Concordance on Quality of Care and Outcomes. *Journal of General Internal Medicine*, *34*(8), 1591-1606. https://doi.org/10.1007/s11606-019-04847-5

Domenteanu, A., Cibu, B., & Delcea, C. (2024). Mapping the Research Landscape of Industry 5.0 from a Machine Learning and Big Data Analytics Perspective: A Bibliometric Approach. *Sustainability*, *16*(7), 2764. https://doi.org/10.3390/su16072764

Elihami, E., Mas'ud, M. I., Sicat, A. S., Ismail, I., Sitonda, S., & Sudirman, M. Y. (2025). Innovation in Education with Impact on Development: Bibliometric Analysis and Mapping in 2024-2025 of Islamic Education. *Journal of Innovation in Educational and Cultural Research*, *6*(1), 185-196. https://doi.org/10.46843/jiecr.v6i1.2131

Ellis, R., Li, S., & Zhu, Y. (2019). The effects of pre-task explicit instruction on the performance of a focused task. *System*, *80*, 38-47. https://doi.org/10.1016/j.system.2018.10.004

Falout, J, Elwood, J., & Hood, M. (2009). Demotivation: Affective states and learning outcomes. *System*, *37*(3), 403-417. https://doi.org/10.1016/j.system.2009.03.004

Gorsuch, G., & Taguchi, E. (2010). Developing reading fluency and comprehension using repeated reading: Evidence from longitudinal student reports. *Language Teaching Research*, *14*(1), 27-59. https://doi.org/10.1177/1362168809346494

Haghani, M., & Rashtchi, M. (2023). Re-examining the effectiveness of processing instruction components for teaching the present subjunctive: Do learning styles make a difference? *Asian-Pacific Journal of Second and Foreign Language Education*, *8*(1). https://doi.org/10.1186/s40862-022-00181-2

Hamavandy, M., & Golshan, M. (2015). Differential Potential of SLA Output Tasks versus Input-based Teaching of English Grammar: A Comparative Study. *Theory and Practice in Language Studies*, *5*(10), 2083. https://doi.org/10.17507/tpls.0510.15

Han, Y., & Hyland, F. (2015). Exploring learner engagement with written corrective feedback in a Chinese tertiary EFL classroom. *Journal of Second Language Writing*, *30*, 31-44. https://doi.org/10.1016/j.jslw.2015.08.002

Hashemifardnia, A., Shafiee, S., Rahimi Esfahani, F., & Sepehri, M. (2021). Effects of flipped instruction on iranian intermediate EFL learners' speaking complexity, accuracy, and fluency. *Cogent Education*, *8*(1). https://doi.org/10.1080/2331186X.2021.1987375

Hashemnezhad, H., & Zangalani, S. K. (2012). The effects of processing instruction and traditional instruction on Iranian EFL learners' writing ability. *English Language Teaching*, *5*(11), 125-135. https://doi.org/10.5539/elt.v5n11p125

Hassanzadeh, M., & Shahbazi, F. (2021). Explicit Instruction of English Articles: An Appraisal of Consciousness-Raising Instruction and Processing Instruction Frameworks. *Journal of Asia TEFL*, *18*(4), 1211-1233. https://doi.org/10.18823/asiatefl.2021.18.4.9.1211

Hassaskhah, J., Barekat, B., & Asli, S. R. (2015). The effect of lecturing in student-generated photomontage on efl learners' fluency,

accuracy and complexity. *Journal of Language Teaching and Research*, 6(5), 1081-1092. https://doi.org/10.17507/jltr.0605.22

He, C., Jia, G., McCabe, B., Chen, Y., & Sun, J. (2019). Impact of psychological capital on construction worker safety behavior: Communication competence as a mediator. *Journal of Safety Research*, 71, 231-241. https://doi.org/10.1016/j.jsr.2019.09.007

Hirotani, M., & Fujii, K. (2019). Learning proverbs through telecollaboration with Japanese native speakers: facilitating L2 learners' intercultural communicative competence. *Asian-Pacific Journal of Second and Foreign Language Education*, 4(1), 5. https://doi.org/10.1186/s40862-019-0067-5

Jiang, Z. W., Zhang, L. J., & Mohamed, N. (2022). Researching Translanguaging as a Feasible Pedagogical Practice: Evidence from Chinese English-as-a-Foreign-Language Students' Perceptions. *RELC Journal*, 53(2), 371-390. https://doi.org/10.1177/00336882221113653

Khemani, B., Patil, S., Kotecha, K., & Tanwar, S. (2024). A review of graph neural networks: concepts, architectures, techniques, challenges, datasets, applications, and future directions. *Journal of Big Data*, 11(1), 18. https://doi.org/10.1186/s40537-023-00876-4

Koranian, K., Reza, A., & Tabrizi, N. (2016). The Effect of Input-based Instruction on the Speaking Ability of Iranian EFL Learners. In *Journal of Applied Linguistics and Language Research* (Vol. 3, Number 4). www.jallr.com

Lai, Y. (2024). Constructivist vs. Non-constructivist Cognitive Linguistics-Based Processing Instruction: Impact on L2 English Request Competence. *Asia-Pacific Education Researcher*. https://doi.org/10.1007/s40299-024-00958-8

Lee, J. S. (2022). The role of grit and classroom enjoyment in EFL learners' willingness to communicate. *Journal of Multilingual and Multicultural Development*, 43(5), 452-468. https://doi.org/10.1080/01434632.2020.1746319

Leonet, O., & Saragueta, E. (2024). The case of a pedagogical translanguaging intervention in a trilingual primary school: the students' voice. *International Journal of Multilingualism*, 21(4), 2112-2130. https://doi.org/10.1080/14790718.2023.2224009

Leontjev, D., Huhta, A., & Mäntylä, K. (2016). Word derivational knowledge and writing proficiency: How do they link? *System*, 59, 73-89. https://doi.org/10.1016/j.system.2016.03.013

Liu, M., & Jackson, J. (2008). An exploration of Chinese EFL learners' unwillingness to communicate and foreign language anxiety. *Modern Language Journal*, 92(1), 71-86. https://doi.org/10.1111/j.1540-4781.2008.00687.x

Liu, Y. (2024). The effect of classroom-based assessment (CBA) on Chinese EFL learners' speaking performance, engagement, and willingness to communicate: Undergraduate students' perceptions. *Heliyon*, 10(12). https://doi.org/10.1016/j.heliyon.2024.e32629

Mahmoudi-Gahrouei, V., Youhanaee, M., & Nejadanasari, D. (2020). Targeting accuracy in foreign language teaching: The role of practice type in learning unsalient grammatical aspects. *International Journal of Applied Linguistics*, 30(3), 390-412. https://doi.org/10.1111/ijal.12292

Malone, M. E., & Montee, M. J. (2010). Oral proficiency assessment: Current approaches and applications for post-secondary foreign language programs. *Linguistics and Language Compass*, 4(10), 972-986. https://doi.org/10.1111/j.1749-818X.2010.00246.x

Mangold, M., Lenhard, W., Schulz, D., Schindler, J., & Weiner-Bühler, J. C. (2025). Bilingual advantage in vocabulary development: a longitudinal look at turkish-german preschoolers. *Language Learning and Development*, 21(2), 193-213. https://doi.org/10.1080/15475441.2024.2429033

Michos, T., & Zorbas, V. (2023). Using "tiktok" as a mobile assisted language learning (mall) application to examine the potential effects on greek efl learners' listening and speaking skills. In *Pedagogical and Research Perspectives on Language Education* (pp. 177-205). Nova Science Publisher Inc. Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-85163653455&partnerID=40&md5=cae8b6c3c9e6b5edb96832a8f62b84fd

Modirkhamene, S., Pouyan, A., & Alavinia, P. (2018). Processing instruction: Learning complex grammar and writing accuracy through structured input activities. *Indonesian Journal of Applied Linguistics*, 8(1), 177-188. https://doi.org/10.17509/ijal.v8i1.11479

Muñoz-Alcón, A. I., Barahona-Esteban, M. N., & Trullén-Galve, F. (2023). Assessing Foreign-Language Students' Speaking Performance through a Digital Platform: Challenges and Findings. *Education Sciences*, 13(10). https://doi.org/10.3390/educsci13101039

Myers, D., Mohawesh, R., Chellaboina, V. I., Sathvik, A. L., Venkatesh, P., Ho, Y.-H., Henshaw, H., Alhawawreh, M., Berdik, D., & Jararweh, Y. (2024). Foundation and large language models: fundamentals, challenges, opportunities, and social impacts. *Cluster Computing*, 27(1), 1-26. https://doi.org/10.1007/s10586-023-04203-7

Naami, A., & Sahragard, R. (2022). The effect of field independence on processing instruction on the acquisition of English passive by Iranian EFL learners. *Instructed Second Language Acquisition*, 6(1), 109-139. https://doi.org/10.1558/isla.20078

Nakatani, Y. (2006). Developing an oral communication strategy inventory. *Modern Language Journal*, 90(2), 151-168. https://doi.org/10.1111/j.1540-4781.2006.00390.x

Nasim, S. M., Altameemy, F., Ali, J. M. A., & Sultana, R. (2022). Effectiveness of Digital Technology Tools in Teaching Pronunciation to Saudi EFL Learners. *FWU Journal of Social Sciences*, 16(3), 68–82. https://doi.org/10.51709/19951272/Fall2022/5

Nurjati, N., Irawan, N., Ratnayanti, Al Imamah, H. U., & Halim. (2024). BIMBINGAN TEKNIS PENGEMBANGAN MODUL AJAR

LISTENING AND SPEAKING MENGGUNAKAN APLIKASI CANVA MATA PELAJARAN BAHASA INGGRIS BERDASARKAN KURIKULUM MERDEKA BAGI GURU SMA DAN SMK. *PANCASONA*, *3*(1), 39-48. https://doi.org/10.36456/pancasona.v3i1.8705

Nwaichi, P. I., Ridzuan, N., Nwaichi, E. O., Umunnawuike, C., Abutu, D., Nyah, F., Money, B., & Agi, A. (2025). Advances in oilwell cement retarders: a bibliometric and systematic review of mechanisms, challenges, emerging trends, and future directions. *Discover Concrete and Cement*, *1*(1), 8. https://doi.org/10.1007/s44416-025-00008-6

Nwaichi, P. I., Ridzuan, N., Nwaichi, E. O., Umunnawuike, C., Nyah, F., Abutu, D., Money, B., & Agi, A. (2025). Technological Advancements in Transportation and Logistics: Exploring Circular Economy Principles through Bibliometric Insights. *Circular Economy and Sustainability*, *5*(7), 6037-6087. https://doi.org/10.1007/s43615-025-00684-3

Pachler, N., & Allford, D. (2004). Literature in the communicative classroom. In *Issues in Modern Foreign Languages Teaching* (pp. 228-241). Taylor and Francis. https://doi.org/10.4324/9780203005682-28

Pardo, B. S. (2014). Digital storytelling: A case study of the creation, and narration of a story by EFL learners. *Digital Education Review*, *26,* 74-84. Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-84923489249&partnerID=40&md5=6c5c39daa1567c4a2f622a6ef69abf49

Phuong Thanh, N., & Van Tuan, T. (2014). Developing The Speaking Skill For Non-english Major Students Through Oral Presentation. *The University of Danang - Journal of Science and Technology, 1,* 128-132. Retrieved from https://www.neliti.com/publications/448469/

Qin, J. (2008). The effect of processing instruction and dictogloss tasks on acquisition of the English passive voice. *Language Teaching Research*, *12*(1), 61-82. https://doi.org/10.1177/1362168807084494

Qu, F., Wang, G., Wen, P., Liu, X., & Zeng, X. (2024). Knowledge mapping of immunotherapy for breast cancer: A bibliometric analysis from 2013 to 2022. *Human Vaccines & Immunotherapeutics*, *20*(1). https://doi.org/10.1080/21645515.2024.2335728

Ren, J., & Wang, M. (2024). Sensitivity to derivational morphology as cues to lexical stress among English as second language learners. *Reading and Writing*, *37*(10), 2803-2830. https://doi.org/10.1007/s11145-023-10496-2

Roohani, A., & Etemadfar, P. (2021). Effect of micro flipped method on efl learners' speaking fluency. *Journal of Asia TEFL*, *18*(2), 559-575. https://doi.org/10.18823/asiatefl.2021.18.2.11.559

Salimi, A., & Shams, K. (2016). The Effect of Input-based and Output-based Instruction on EFL Learners' Autonomy in Writing. *Theory and Practice in Language Studies*, *6*(3), 525. https://doi.org/10.17507/tpls.0603.10

Shen, X., Hao, C., & Peng, J.-E. (2024). Promoting EFL learners' willingness to communicate through transmediation in a digital storytelling workshop. *Journal of Multilingual and Multicultural Development*, *45*(8), 3109-3126. https://doi.org/10.1080/01434632.2022.2086257

Shirinbakhsh, S., Rasekh, A. E., & Tavakoli, M. (2018). Metapragmatic instruction (6Rs) versus input-based practice: a comparison of their effects on pragmatic accuracy and speed in the recognition and oral production of English refusals. *The Language Learning Journal*, *46*(4), 514-537. https://doi.org/10.1080/09571736.2016.1186722

Smith, P., & King, J. R. (2013). An Examination of Veridicality in Verbal Protocols of Language Learners. *Theory and Practice in Language Studies*, *3*(5). https://doi.org/10.4304/tpls.3.5.709-720

Spring, R. (2020). Can video-creation project work affect students' oral proficiency? An analysis of fluency, complexity and accuracy. *TESL-EJ*, *24*(2). Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-85096542863&partnerID=40&md5=e54ef10ba377572fa92a194f2c37b0f3

Subekti, A. S. (2018). Investigating the Relationship between Foreign Language Anxiety and Oral Performance of Non-English Major University Students in Indonesia. *Dinamika Ilmu*, *18*(1), 15-36. https://doi.org/10.21093/di.v18i1.880

Tatlı, Z., Saylan, E., & Kokoç, M. (2022). Digital Storytelling in an Online EFL Course: Influences on Speaking, Vocabulary, and Cognitive Load. *Participatory Educational Research*, *9*(6), 89-112. https://doi.org/10.17275/per.22.130.9.6

Torkabad, M. G., & Fazilatfar, A. M. (2014). Textual Enhancement and Input Processing Effects on the Intake of Present and Past Simple Tenses. *Procedia - Social and Behavioral Sciences*, *98*, 562-571. https://doi.org/10.1016/j.sbspro.2014.03.452

Tran, D. T., Cao, B. T. N., & Dang, D. T. B. (2024). Factors influencing EFL learners' speaking fluency: A case study at a high school in Vietnam. *Edelweiss Applied Science and Technology*, *8*(6), 3979-3996. https://doi.org/10.55214/25768484.v8i6.2876

Tuan, L. T. (2012). Teaching and assessing speaking performance through analytic scoring approach. *Theory and Practice in Language Studies*, *2*(4), 673–679. https://doi.org/10.4304/tpls.2.4.673-679

Turula, A. (2011). Language analytic ability in advanced FL learners: A comparative study. *Linguistica Silesiana*, *32*, 275-287. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84875754369&partnerID=40&md5=4f638fc8e3934a129be486db2a73e5c0

Wijaya, D., & Djasmeini, C. C. (2017). Input-based processing instruction vs. output-based traditional instruction in learning plural -s. *Electronic Journal of Foreign Language Teaching*, *14*(1), 70-83. Retrieved from

https://www.scopus.com/inward/record.uri?eid=2-s2.0-85021343761&partnerID=40&md5=44609eaddc091e60b23174c87c3888db

Woldetsadik, G. T., Bachore, M. M., Woldeab, T. A., & Gezahegn, T. H. (2022). Mobile-based aural oral skill lessons: The effects on EFL teacher trainees' oral performance. *Cogent Education*, *9*(1). https://doi.org/10.1080/2331186X.2022.2112943

Wu, W. V, Hsieh, J. S. C., & Yang, J. C. (2017). Creating an online learning community in a flipped classroom to enhance efl learners' oral proficiency. *Educational Technology and Society*, *20*(2), 142-157. Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-85018761456&partnerID=40&md5=3da68d0a68e692930b1dd984af88eb7c

Xie, T., Zhang, H., & Yang, Y. (2025). Effect of immersive virtual reality based upon input processing model for second language vocabulary retention. *Education and Information Technologies*. https://doi.org/10.1007/s10639-025-13333-x

Yan, R., Liu, B., & Zhang, L. J. (2024). Effects of pedagogical intervention on Chinese EFL learners' use of motivational regulation strategies and oral English proficiency improvement. *Heliyon*, *10*(19). https://doi.org/10.1016/j.heliyon.2024.e38355

Yen, Y. C., Hou, H. T., & Chang, K. E. (2013). Applying Skype in English as a foreign language instruction: Effect on students' speaking errors. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, *8167 LNCS*, 312-319. https://doi.org/10.1007/978-3-642-41175-5_32

Yenkimaleki, M., & van Heuven, V. J. (2023). Effect of pedagogic intervention in enhancing speech fluency by EFL students: A longitudinal study. *Language Teaching Research*. https://doi.org/10.1177/13621688231205017

Zeng, T., Xu, C., Hu, J., & Fu, X. (2024). Processing Instruction Versus Traditional Instruction: The Transfer-of-Training Effects on Chinese EFL Learners. *SAGE Open*, *14*(1). https://doi.org/10.1177/21582440241231037

Zhang, Y., & Liu, G. L. (2023). Examining the impacts of learner backgrounds, proficiency level, and the use of digital devices on informal digital learning of English: an explanatory mixed-method study. *Computer Assisted Language Learning*. https://doi.org/10.1080/09588221.2023.2267627

Zhang, Y., Fauzi, W. J., & Kassim, H. (2025). Input-based instruction as a teaching strategy for enhancing EFL speaking skills: a systematic review. *Discover Education*, *4*(1), 534. https://doi.org/10.1007/s44217-025-01008-1

Zhao, Y., & Liu, J. (2019). Screenplays as a pedagogical medium for cultivating EFL learners' metapragmatic awareness of speech acts in spoken english. In *Literature, Spoken Language and Speaking Skills in Second Language Learning* (pp. 118-148). Cambridge University Press. https://doi.org/10.1017/9781108641692.007

Zúñiga, E. C., Mayorga, E., & Ruiz, N. (2023). Potential Implications of Task-Based Language Teaching on Developing EFL Learners' Oral Fluency. *International Journal of Learning, Teaching and Educational Research*, *22*(11), 130-149. https://doi.org/10.26803/ijlter.22.11.8