



Identifying and Analyzing Undergraduate Students' Learning Needs for Phonetics and Phonology in an Introductory Linguistics Course

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Abstract: This study investigates the specific learning needs of undergraduate students in the subfields of phonetics and phonology within an introductory linguistics course. Drawing on survey data from 392 English majors at application-oriented universities in Jiangxi Province, China, the research examines students' perceived importance of core topics such as speech production mechanisms, phonetic transcription, consonant and vowel systems, suprasegmental features, and basic phonological rules. A five-point Likert-scale questionnaire was used to collect data, and descriptive statistics were applied to identify priority areas. The results indicate that students place the highest importance on articulatory knowledge (e.g., speech organs, vowels, consonants) and prosodic features, reflecting a preference for tangible and directly applicable content. Conversely, topics such as non-English speech sounds and advanced transcription were rated lower, suggesting perceived difficulty or limited relevance to students' academic and career trajectories. The findings are interpreted through the lens of constructivist learning theory and Bloom's Revised Taxonomy, highlighting the need for scaffolded instruction that transitions from concrete, observable concepts to more abstract analytical skills. Pedagogical implications include the integration of visual and experiential activities, targeted support for complex transcription skills, and contextualization of non-English sound systems to enhance engagement and learning outcomes.

Keywords: Learning needs, Phonetics and phonology, Introductory linguistics course, Constructivism

I. Introduction

As linguistics teaching increasingly shifts toward learner-centered and needs-based approaches, understanding students' specific learning requirements within core linguistic subfields has become a critical pedagogical concern. In particular, introductory linguistics courses serve as the foundation for developing analytical and communicative competencies that underpin advanced linguistic study and professional language use. Among the various domains of linguistics, phonetics and phonology stand out as areas where learners often experience both high interest and notable difficulty, making the systematic exploration of their learning needs essential for curriculum improvement and effective teaching practice.

1.1 Research Background

Phonetics and phonology form the foundational core of linguistic studies, providing the analytical tools for understanding the physical properties of speech sounds and the systematic patterns that govern their organization in languages. In the context of an introductory linguistics course, these two subfields not only establish the basis for further study in morphology, syntax, and semantics, but also enhance learners' awareness of sound systems in both their native and target languages. For students majoring in English at application-oriented universities in China, a solid grounding in phonetics and phonology is particularly crucial. Accurate pronunciation, effective listening comprehension, and the ability to analyze and explain sound patterns are essential competencies for prospective English teachers, translators, and professionals engaged in language training or cross-cultural communication. However, despite the recognized importance of these domains, students' actual learning needs in phonetics



and phonology often vary considerably, influenced by their prior exposure to phonetic training, differences in regional accents, and varying levels of English proficiency. Understanding these needs is therefore critical for tailoring course content, teaching strategies, and assessment methods to better support learning outcomes.

1.2 Research Significance

Identifying and analyzing students' needs in phonetics and phonology offers value in both academic and professional dimensions. From an educational perspective, it provides empirical evidence for refining curriculum design and instructional approaches in the introductory linguistics course, ensuring that teaching priorities align with learners' specific challenges and goals. From a career development perspective, targeted training in these areas can enhance employability and workplace performance in occupations such as English language teaching, translation and interpreting, and speech coaching, where precise articulation, phonological awareness, and communicative clarity are indispensable.

1.3 Research Aim and Questions

The present study aims to investigate the perceived importance and learning priorities of undergraduate students regarding specific topics within phonetics and phonology in an introductory linguistics course. It further seeks to explore the factors underlying these priorities, such as linguistic background, learning experiences, and future career aspirations.

The study is guided by the following research questions:

1. What is the relative priority that undergraduate students assign to different phonetics and phonology topics in the course?
2. What factors influence these learning needs and prioritizations?

II. Literature Review

A review of existing literature provides the theoretical and empirical foundation for examining students' learning needs in phonetics and phonology. This section first outlines the pedagogical significance of phonetics and phonology within linguistics education, followed by an overview of needs analysis as a key framework for identifying learners' priorities in language learning. Finally, it contextualizes these issues within the Chinese application-oriented EFL environment, where students' linguistic diversity and career-oriented training goals necessitate a more tailored and practical approach to teaching

sound-related knowledge.

2.1 Phonetics and Phonology in Linguistics Education

Phonetics and phonology are widely recognized as the entry points into linguistic inquiry, serving both descriptive and analytical purposes. Phonetics examines the physical and physiological aspects of speech sounds, encompassing articulatory, acoustic, and auditory dimensions, while phonology studies the abstract systems and rules that govern the organization of these sounds in a given language (Zsiga, 2024). In introductory linguistics curricula, these subfields are essential for developing learners' analytical skills, enabling them to transcribe speech accurately, identify phonological patterns, and apply theoretical concepts to real-world communication problems. Previous studies have shown that early mastery of sound-related knowledge facilitates the acquisition of other linguistic domains, such as morphology and syntax, and supports the development of clear and intelligible speech (Iverson, 2010). Consequently, effective instruction in phonetics and phonology plays a pivotal role in the broader success of language learning.

2.2 Needs Analysis in Language Learning

Needs analysis is a systematic process of identifying the specific knowledge, skills, and competencies that learners require to achieve their academic or professional goals (Hutchinson & Waters, 1987; Richards, 2001). Within language education, needs analysis often distinguishes between target needs—what learners must know to perform effectively in their target contexts—and learning needs—what learners need in order to bridge the gap between their current competence and target competence. Numerous studies have employed questionnaires, interviews, and diagnostic tests to map learners' needs in pronunciation, listening comprehension, and phonological awareness, highlighting the importance of aligning course design with learner priorities (Luchini & Galante, 2024). In the case of phonetics and phonology, needs analysis can uncover learners' difficulties in distinguishing minimal pairs, producing target sounds, or understanding suprasegmental features such as stress and intonation.

2.3 Learning Needs in the Chinese Application-Oriented EFL Context

In China's application-oriented universities, English programs aim to balance theoretical linguistic knowledge with practical communicative competence. Students in these institutions often come from diverse



linguistic backgrounds, including a variety of regional dialects that may influence their pronunciation of English sounds (Siregar, 2017). While many students receive basic phonetic training in earlier stages of their education, this instruction is frequently limited to isolated drills and may not address deeper phonological concepts or the integration of sound knowledge into fluent communication. Studies have indicated that Chinese EFL learners tend to face persistent challenges in producing certain English consonants and vowels, as well as in mastering prosodic patterns such as rhythm and intonation (Chen, 2020). These challenges can hinder not only their spoken intelligibility but also their confidence in professional communication contexts, including teaching and interpreting. Therefore, a focused examination of students' perceived learning needs in phonetics and phonology can provide valuable insights for curriculum developers and instructors in these institutions.

III. Methodology

This study employed a quantitative descriptive research design to investigate undergraduate students' perceived learning needs in the subfields of phonetics and phonology. A structured questionnaire was developed to collect large-scale data on topic-specific priorities within an introductory linguistics course. The methodological process included participant selection, instrument design, and statistical analysis, all conducted with the aim of identifying and interpreting patterns in students' perceptions of importance across speech sound domain.

3.1 Participants

The study involved a total of 392 undergraduate students enrolled in English programs at application-oriented universities in Jiangxi Province, China. All participants were in their third year of study and had completed at least one semester of introductory linguistics, ensuring a basic familiarity with phonetics and phonology concepts. The sample included students from diverse regional and linguistic backgrounds, which allowed for the consideration of potential dialectal influences on their perceptions of sound-related knowledge. Participation was voluntary, and informed consent was obtained prior to data collection.

3.2 Research Instrument

A structured questionnaire was designed to elicit students' perceptions of their learning needs in phonetics and phonology. The instrument consisted of two main sections:

Phonetics – five topic items: (1) Speech Organs, (2) Phonetic Transcription, (3) Consonant Classification, (4) Vowel Classification, and (5) Non-English speech sounds

Phonology – four topic items: (1) Phoneme and Allophone, (2) Phonological rules, (3) Phonological analysis, and (4) Supra-segmental features

Each item was rated on a 5-point Likert scale, ranging from 1 ("Not important at all") to 5 ("Extremely important"), reflecting the perceived importance of mastering the topic in the context of the introductory linguistics course.

3.3 Data Collection and Analysis

The questionnaire was administered in person during scheduled class sessions to ensure a high response rate and minimize missing data. Descriptive statistics (mean scores and standard deviations) were computed for each topic to determine overall trends in perceived importance. Additionally, mean scores were used to generate rank orders of the topics within the phonetics and phonology categories, allowing for a comparative analysis of priority levels. This combination of descriptive analysis and ranking comparison provided both a numerical and a relative perspective on students' learning needs. Data were processed using SPSS Statistics 26.0.

IV. Results

This section presents the findings of the study, focusing on undergraduate students' perceived learning needs in the phonetics and phonology components of an introductory linguistics course. Descriptive statistics were used to identify the relative importance of each topic within the two subfields, and the results are organized into four parts. Section 4.1 reports the findings for phonetics, Section 4.2 for phonology, while Section 4.3 provides a comparative summary of student priorities across both domains, followed by an overall synthesis in Section 4.4.

4.1 Phonetics

This subsection reports students' perceived learning needs for the five phonetics topics included in the questionnaire: Speech Organs, Vowel Classification, Consonant Classification, Non-English Speech Sounds, and Phonetic Transcription.

Descriptive statistics (Table 1) show that Speech Organs received the highest mean score, reflecting students' recognition of its foundational role in understanding how speech sounds are physically produced. Vowel Classification and Consonant Classification were also rated highly, indicating their perceived importance for pronunciation accuracy and linguistic analysis.



Non-English Speech Sounds received comparatively lower scores, suggesting that learners may consider it less directly relevant to their immediate academic and professional needs. Phonetic Transcription was

valued for its utility in accurate pronunciation representation, though its score was slightly lower than the articulation-related topics.

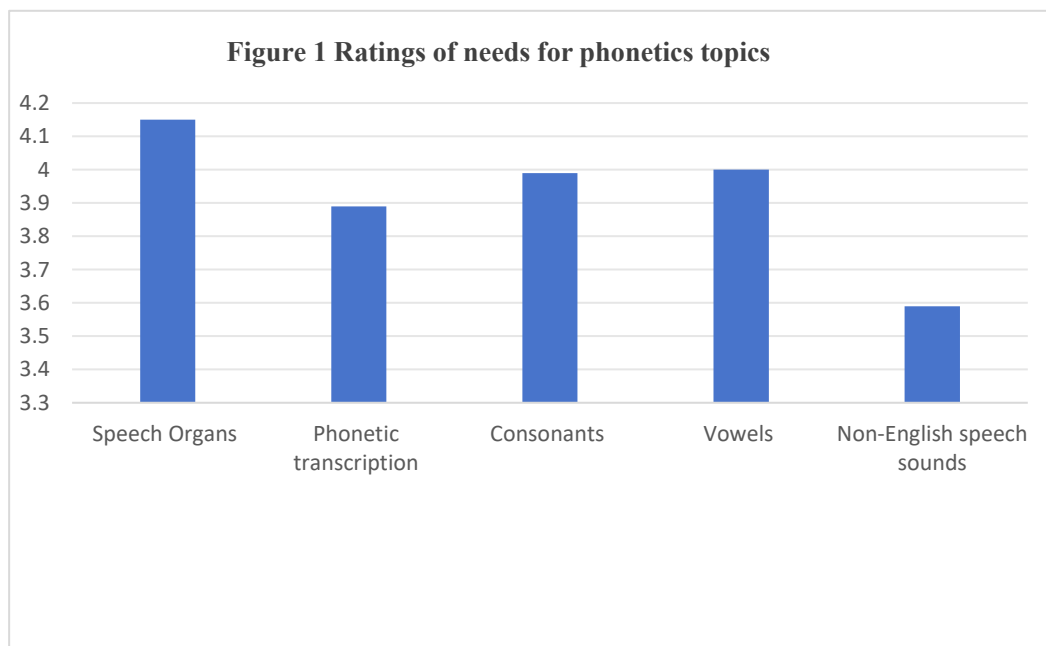
Table 1
Learning Needs for Phonetics Topics

Topic	Mean Score	SD	Rank
Speech Organs	4.15	0.04	1
Vowels	4.00	0.04	2
Consonants	3.99	0.05	3
Phonetic Transcription	3.89	0.04	4
Non-English Speech Sounds	3.59	0.04	5

Note. N = 392. Ratings were given on a 5-point Likert scale (1 = Not important at all, 5 = Extremely important).

The rank order shown in Figure 1 was as follows: Speech Organs > Vowel Classification > Consonant Classification > Phonetic Transcription > Non-English Speech Sounds. Overall, topics

involving articulatory knowledge and classification of English sounds received higher ratings than those perceived as less directly applicable to students' immediate learning goals.



4.2 Phonology

This subsection reports students' perceived learning needs for the four phonology topics included in the questionnaire: Supra-segmental Features, Phonological Analysis, Phoneme and Allophones, and Phonological Rules.

Descriptive statistics (Table 2) show that Supra-segmental Features – including stress, intonation, and rhythm – received the highest mean rating, reflecting students' recognition of its practical value in achieving natural and intelligible speech.

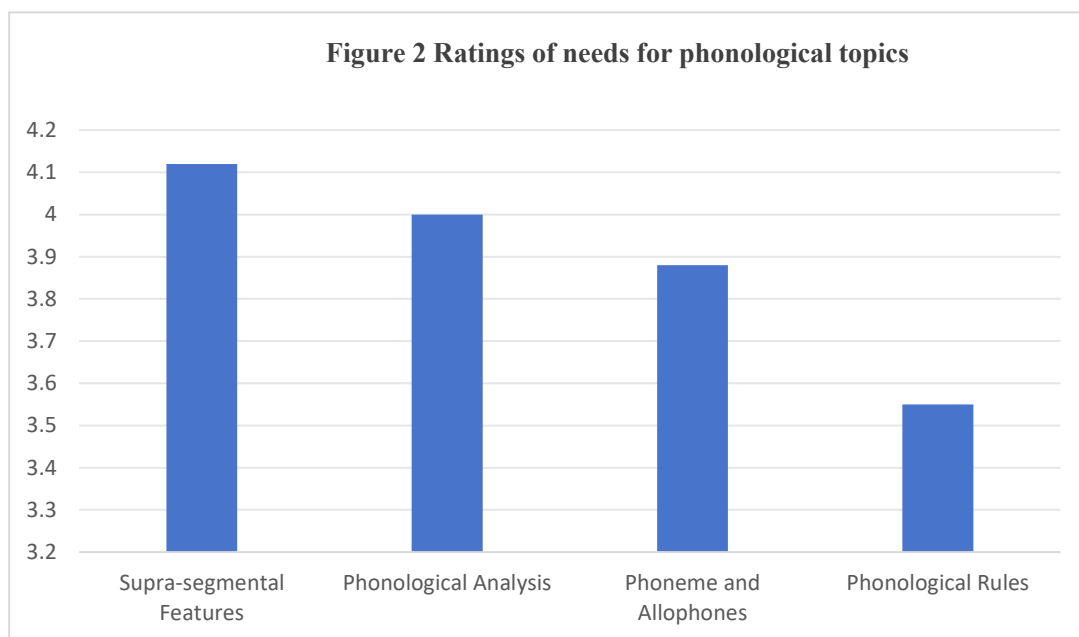
Phonological Analysis ranked second, indicating its importance for developing a deeper understanding of phonological theory and its application to real linguistic data. Phoneme and Allophones was rated moderately high, suggesting that students are aware of its role in distinguishing meaning through sound contrasts. Phonological Rules obtained the lowest score in this category, possibly due to its perceived complexity and its less direct application in everyday communication.



Table 2
Learning Needs for Phonological Topics

Topic	Mean Score	SD	Rank
Supra-segmental Features	4.12	0.04	1
Phonological Analysis	4.00	0.04	2
Phoneme and Allophones	3.88	0.04	3
Phonological Rules	3.55	0.04	4

The rank order shown in Figure 2 was as follows: Supra-segmental Features > Phonological Analysis > Phoneme and Allophones > Phonological Rules. Overall, students valued practical and perceptually salient features over abstract theoretical constructs, mirroring the trend observed in the phonetics section.



4.3 Comparative Analysis of Student Priorities

Figures 1 and 2 illustrate the ranking of students' perceived learning needs in phonetics and phonology, respectively. As shown in Figure 1, within phonetics, topics such as Speech Organs, Vowels, and Consonants received higher ratings,

whereas Phonetic Transcription and Non-English Sounds were rated lower. Similarly, Figure 2 shows that in phonology, Supra-segmental Features and Phonological Analysis were prioritized, while Phonological Rules received the lowest mean score.

Table 3
Student Priorities in Phonetics and Phonology

Subfield	Higher-rated topics	Lower-rated topics	Pedagogical implication
Phonetics	Speech Organs, Vowels, Consonants	IPA Transcription, Non-English Sounds	Emphasize articulatory grounding; scaffold transcription and contrastive tasks
Phonology	Supra-segmental Features, Phoneme Analysis	Abstract Phonological Rules	Prioritize functional fluency; introduce formal rules gradually with scaffolding



To synthesize these results, Table 3 presents a comparative summary of student priorities across the two subfields, distinguishing between higher- and lower-rated topics and outlining pedagogical implications.

Taken together, the comparison highlights a consistent trend: students show strong motivation for concrete and visually accessible content (articulatory knowledge and prosodic features) and relatively less interest in abstract or less immediately applicable areas (transcription, non-English contrasts, and formal rules). This suggests the need for a sequenced instructional design that begins with foundational articulatory and prosodic knowledge, then gradually scaffolds learners toward abstract analytical tasks.

4.4 Overall Trends

Across both subfields, students consistently prioritized topics that were highly visual and directly applicable to spoken communication. These included diagrams of speech organs, vowel and consonant classification charts, and supra-segmental features such as stress, intonation, and rhythm. Articulatory knowledge appeared to be particularly valued, likely due to its immediate utility in enhancing pronunciation accuracy and overall speech clarity.

In contrast, more theoretical or abstract topics—such as phonological rules and non-English speech sounds—were rated lower. This pattern may reflect students' perceptions of these topics as either more difficult to master or less directly connected to their immediate academic and professional needs.

Taken together, these results suggest that students tend to favor practical, accessible content that yields tangible benefits for both academic performance and workplace readiness, a trend that was mirrored across the phonetics and phonology sections.

V. Discussion

The findings indicate that students place high value on pronunciation topics that are concrete and easy to observe, such as articulatory descriptions and transcription. This aligns with constructivist thinking, which emphasizes learning through active engagement with tangible content. The progression from understanding concepts to applying and analyzing them—seen in students' interest in transcription practice and supra-segmental analysis—reflects the skill development path described in Bloom's Taxonomy. More complex topics, like stress and intonation, require greater scaffolding and guided practice, which is consistent with the Zone of Proximal Development (ZPD).

The comparative analysis of phonetics and phonology priorities (Table 3) reinforces these trends. Across both subfields, learners consistently prioritized concrete, perceptually salient knowledge (e.g., speech organs, vowels, consonants, supra-segmental features) while assigning lower importance to abstract or less immediately applicable areas such as IPA transcription, non-English contrasts, and formal phonological rules. This suggests that students perceive immediate academic and communicative utility in articulatory and prosodic features, while regarding abstract theoretical constructs as more difficult and less relevant to their professional needs.

These results are consistent with earlier pronunciation teaching studies (e.g., Hsu, 2016; Pennington, 2021) that highlight learners' preference for perceptually clear and communicatively useful features. However, unlike previous work, this study pinpoints how students rank subtopics within phonetics and phonology, and how their preferences shift when these are embedded in communicative tasks. This supports the idea proposed by Darcy (2018) that pronunciation instruction is most effective when linked to real-life communication rather than taught in isolation.

From a pedagogical perspective, three recommendations stand out:

1. **Integrate phonetic experiments and visual aids**—such as diagrams, animations, and acoustic analysis tools—to help students internalize articulatory concepts.
2. **Embed stress, rhythm, and intonation practice into conversation-based tasks** so that learners can apply supra-segmental knowledge in authentic communicative contexts.
3. **Design contextualized transcription and cross-linguistic sound activities**, such as role-play or multilingual comparisons, to make abstract concepts more accessible and transferable beyond the classroom.

Overall, the results highlight the need for a sequenced and scaffolded approach to teaching phonetics and phonology: beginning with concrete, observable features, then progressively introducing abstract phonological concepts within meaningful contexts. This balance not only respects learners' immediate needs but also equips them with the analytical skills required for advanced linguistic study and professional application.

VI. Conclusion

This study examined undergraduate students' learning needs in phonetics and phonology within an introductory linguistics course. The results indicate a



clear preference for concrete, observable topics, such as articulatory descriptions and phonetic transcription, alongside a recognition of the importance of supra-segmental features when sufficient instructional support is provided. The findings suggest a learning progression from understanding toward application and analysis, underscoring the need for a sequenced approach in course design.

In terms of curriculum development, three recommendations are proposed. First, adopt interactive and visual resources—including articulatory animations, spectrogram displays, and diagram-based explanations—to enhance conceptual clarity. Second, integrate stress, rhythm, and intonation practice into authentic communicative activities, ensuring that learners can apply these features in real-life exchanges. Third, design contextualised transcription and cross-linguistic sound comparison tasks to promote transfer of skills beyond the classroom.

Despite its contributions, the study has several limitations. The participant sample was drawn from a single institution, which may restrict the generalisability of the findings to other educational settings. The reliance on self-reported perceptions means that the results reflect students' views rather than measured performance gains. Additionally, the scope of analysis was limited to phonetics and phonology, leaving other subfields of linguistics unexamined.

Future research could address these limitations in three ways. First, conducting multi-institutional or cross-regional studies would provide a broader dataset and allow for comparative analysis across different learner profiles. Second, combining needs analysis with longitudinal performance assessments would help verify whether the prioritised topics lead to measurable improvements in learning outcomes. Third, exploring integrated teaching approaches that connect phonetics and phonology with other linguistic domains could offer a more holistic framework for course design.

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