




An Empirical Exploration into the Pedagogical and Cognitive Challenges of Phonetics: A Case Study of Fourth-Semester Students at the Faculty of Languages, Benghazi University

Hajir Saeid ^{1*}, Asmaa Ibrahim ²

^{1,2} Department of Theoretical Linguistics, Faculty of Languages, University of Benghazi, Benghazi, Libya.
hajir.saeid@uob.edu.ly

دراسة تجريبية للتحديات التربوية والمعرفية لعلم الصوتيات: دراسة حالة لطلاب الفصل الدراسي الرابع في كلية اللغات بجامعة بنغازي

هاجر سعيد محمد سعيد ^{1*}، أسماء إدريس عامر إبراهيم ²
^{2.1} قسم علم اللغة النظري، كلية اللغات، جامعة بنغازي، بنغازي، ليبيا.

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المخلص:

هدفت هذه الدراسة المعنونة بـ "دراسة تجريبية للتحديات التعليمية والمعرفية في تعلم علم الصوتيات: دراسة حالة لطلاب السنة الرابعة في كلية اللغات بجامعة بنغازي"، إلى تحديد وتحليل الصعوبات الرئيسية التي يواجهها الطلاب في تعلم علم الصوتيات من منظورين تربوي ومعرفي. اعتمدت الدراسة منهجاً وصفيًا تحليليًا، مدعومًا بمنهج المسح الميداني، حيث جُمعت البيانات باستخدام استبيان مُهيكل وُزِع على عينة عشوائية بسيطة مكونة من 100 طالب من طلاب السنة الرابعة.

واعتمد البحث على كلٍّ من البيانات الأولية (إجابات الطلاب) والمصادر الثانوية، مثل الكتب والمراجع العلمية والدراسات السابقة المتعلقة بصعوبات تعلم علم الصوتيات. حُلَّت البيانات باستخدام أساليب إحصائية وصفية، بما في ذلك التكرارات والنسب المئوية، لتحديد مستوى وطبيعة التحديات.

وكشفت النتائج أن نسبة كبيرة من الطلاب يواجهون صعوبات كبيرة في فهم محتوى علم الصوتيات، ويعود ذلك أساسًا إلى هيمنة أساليب التدريس النظرية، ومحدودية استخدام الوسائل التعليمية الحديثة، وضعف التفاعل الصفّي، وعدم كفاية التغذية الراجعة. بالإضافة إلى ذلك، وُجد أن التحديات المعرفية، كصعوبة النطق والتمييز الصوتي وتداخل اللغات، تؤثر بشكل كبير على أداء الطلاب، وبشكل عام اعتُبرت الصوتيات مادةً صعبةً مقارنةً بمقررات اللغات الأخرى.

وخلصت الدراسة إلى أن العوامل التعليمية والمعرفية تُسهم في صعوبات تعلم الصوتيات، وأكدت على ضرورة تحسين استراتيجيات التدريس. وبناءً على هذه النتائج، أوصت الدراسة بتعزيز التدريب العملي،

ودمج الأدوات السمعية والبصرية الحديثة، وتحسين التفاعل الصفّي، وتقديم تغذية راجعة مستمرة، ودعم استخدام مختبرات اللغة وتطبيقات التعلم الرقمي لتحسين تدريس الصوتيات.

الكلمات الدالة: علم الصوتيات، التحديات التعليمية، التحديات المعرفية، أساليب التدريس، التفاعل.

Abstract

This study titled “An Experimental Study of Educational and Cognitive Challenges in Learning Phonetics: A Case Study of Fourth-Year Students at the Faculty of Languages, University of Benghazi” aimed to identify and analyze the main difficulties faced by students in learning phonetics from both pedagogical and cognitive perspectives. The study adopted a descriptive-analytical approach, supported by a field survey method, where data were collected using a structured questionnaire administered to a sample of 100 fourth-year students selected through simple random sampling.

The research relied on both primary data (students’ responses) and secondary sources such as books, scientific references, and previous studies related to phonetics learning difficulties. The data were analyzed using descriptive statistical methods, including frequencies and percentages, to determine the level and nature of the challenges.

The findings revealed that a large proportion of students experience significant difficulties in understanding phonetics content, mainly due to the dominance of theoretical teaching methods, limited use of modern instructional aids, weak classroom interaction, and insufficient feedback. In addition, cognitive challenges such as difficulty in pronunciation, sound discrimination, and language interference were found to strongly affect students’ performance. Overall, phonetics was perceived as a difficult subject compared to other language courses.

The study concluded that both educational and cognitive factors contribute to the challenges in learning phonetics and emphasized the need for improving teaching strategies. Based on these findings, the study recommended strengthening practical training, integrating modern audio-visual tools, enhancing classroom interaction, providing continuous feedback, and supporting the use of language laboratories and digital learning applications to improve phonetics instruction.

Keywords: Phonetics, Educational Challenges, Cognitive Challenges, Teaching Methods, Interaction.

Introduction

In the contemporary era of globalized communication, the mastery of English as a lingua franca has transitioned from an academic elective to a primary professional necessity. For many individuals worldwide, proficiency in English facilitates cross-cultural exploration and provides critical opportunities for professional mobility, particularly within the pedagogical sector. While the acquisition of English necessitates a balanced mastery of the four macro-skills—reading, writing, listening, and speaking—the latter is frequently cited as the most vital competency for effective international exchange. The ultimate objective for English as a Foreign Language (EFL) learners is to achieve oral fluency and phonological accuracy that aligns with intelligible standards. However, the path to such proficiency is often obstructed by significant phonetic and phonological challenges.

Extant literature indicates that the mastery of English sounds represents a formidable hurdle for students, often requiring extensive temporal and cognitive investment. Inaccurate pronunciation is not merely a superficial error; it has the potential to yield deleterious academic and professional outcomes. According to Gilakjani (2012), “poor pronunciation causes difficulties for learners during their studies, while clear pronunciation motivates them to study the target language” (p. 96). Despite the critical nature of this skill, Harmer (2001) posits that many educators marginalize pronunciation instruction, often perceiving the subject as pedagogically tedious or overly complex. Consequently, there is a pressing need for a central focus on phonetic instruction during the foundational stages of language learning. These challenges are frequently

exacerbated by phonetic interference, primarily stemming from first-language (L1) transfer and the inherent disparities between the phonological systems of the mother tongue and the target language (Othman & Abubaker, 2021).

While speech is a primary vehicle for human connection, the transition from isolated phonemes to complex, meaningful discourse is an intricate process governed by the principles of phonetics and linguistics. In regions where English language instruction is rapidly expanding, these domains often present significant hurdles. EFL students encounter obstacles in maintaining motivation due to the perceived complexity of phonetic notation, abstract linguistic theories, and a lack of alignment with diverse learning preferences. Nevertheless, the strategic integration of phonetics and linguistics into the curriculum offers profound advantages for both practitioners and learners. By utilizing these disciplines as pedagogical tools, instructors can clarify articulatory nuances with greater precision and assist students in navigating the subtleties of grammatical structures. Ultimately, phonetics and linguistics should not be viewed as academic barriers, but rather as indispensable assets that establish the bedrock for intelligible communication and a successful educational trajectory (Guerfa, 2024).

1.1 Objectives of the Study

The purpose of this empirical research is to explore the pedagogical and cognitive challenges associated with the instruction and acquisition of phonetics among English as a Foreign Language (EFL) students. Specifically, this case study aims to identify the articulatory difficulties encountered by fourth-semester students at the Faculty of Languages, Benghazi University. Furthermore, the investigation endeavors to evaluate how these obstacles influence students' phonological outcomes and to offer pedagogical insights that may facilitate the optimization of phonetic instruction at the tertiary level.

1.2 Research Questions

- 1- What are the primary pedagogical obstacles encountered by instructors in the delivery of phonetic curricula to EFL learners?
- 2- Which cognitive complexities do fourth-semester students experience during the perception and production of English phonemes?
- 3- Which distinct phonological segments or features prove most challenging for students to master and articulate accurately?
- 4- How do these pedagogical and cognitive difficulties impact students' general articulatory competence and oral proficiency in English?
- 5- What evidence-based strategies can be proposed to mitigate these challenges and enhance the teaching and learning of phonetics?

2.1 Theoretical Framework: Phonetics and the Articulatory System

Phonetics is the scientific study of the acoustic signals produced by the human vocal tract, focusing on their physiological production and the variations resulting from the precise coordination of articulatory organs, ranging from the lingual muscles to the pharyngeal structures. In the context of second language acquisition (SLA), phonetics remains a fundamental component of the learning process, as it provides the articulatory framework necessary for the production of target language sounds (Huamanquispe, 2021). Beyond segmental production, mastering phonetics allows learners to approximate native-like prosody and intonation, which are often the most challenging aspects of phonological competence to acquire.

Speech production can be analyzed through various linguistic lenses, most notably articulatory phonetics—which examines the physical production of sounds—and acoustic phonetics, which focuses on the physical properties of the sound waves themselves. Within this field, a distinction is made between the phoneme, an abstract mental representation of a sound, and the phone, the actual sound produced during speech. A single phoneme may manifest as multiple phonetic variants, or allophones, depending on the phonetic environment or its position within a syllable (Huamanquispe, 2021). For instance, sounds in a spoken chain are often subject to co-articulation, where adjacent segments influence one another, resulting in allophones in complementary distribution. These systematic variations are often imperceptible to native speakers but are critical for EFL learners to master for accurate articulation.

2.1.1 Branches of Phonetics

Phonetics is the linguistic sub-discipline dedicated to the systematic investigation of speech sounds, providing the methodologies required for the description, classification, and transcription of human vocalizations. This field examines the physiological constraints of the vocal tract and the acoustic properties of the phonemes that constitute the world's languages. According to Hoque (2020), phonetics is essential in contemporary communication, as it refines articulatory precision, enhances reading fluency through acoustic decoding, and bolsters learner confidence in oral proficiency.

The discipline is traditionally divided into three primary branches, categorized by the production, transmission, and perception of speech:

2.1.1.2 Articulatory Phonetics

Articulatory phonetics investigates the physiological mechanisms involved in the generation of speech. This branch focuses on the movement of the "speech organs"—including the lungs, larynx, tongue, and lips—and how their coordination results in specific phonological segments. As Zsiga (2024) notes, the human biological configuration is unique in its ability to produce a vast spectrum of consonantal and vocalic sounds, a capacity not shared by non-human primates due to distinct cranial and mandibular morphology.

2.1.1.3 Acoustic Phonetics

Acoustic phonetics examines the physical properties of the acoustic signals generated by the articulatory system. When the vocal apparatus moves, it creates a pattern of perturbation in air particles that travels as sound waves (Harrington, 2010). This branch utilizes computational tools and spectrograms to analyze variables such as frequency (pitch), intensity (amplitude), and duration. Research in this domain often intersects with engineering and psychology to interpret simple versus complex waveforms and the spectral characteristics of periodic and aperiodic sounds (Hoque, 2020).

2.1.1.4 Auditory Phonetics

Auditory phonetics is concerned with the perception and cognitive processing of speech sounds. This field explores the relationship between acoustic fundamentals and the listener's neurological response via the peripheral and central auditory systems, specifically within the cerebral cortex (Hoque, 2020). By analyzing how the human ear and brain interpret sound waves, auditory phonetics completes the scientific cycle of spoken language.

2.2 The Biological Basis of Speech

The human vocal apparatus comprises a complex network of physiological structures categorized into the respiratory (abdominal muscles and lungs), phonatory (larynx), and articulatory (oral and nasal cavities) systems. While these are frequently referred to as "speech organs," Zsiga (2024) argues that their primary evolutionary functions are life-sustaining, such as gas exchange and mastication; their role in linguistic communication is an exaptation.

The evolutionary emergence of the modern vocal tract is estimated to have occurred between 50,000 and 100,000 years ago (Zsiga, 2024). A persistent debate in paleoanthropology concerns whether the cognitive capacity for language preceded the physiological development of the vocal tract. Although cranial fossil records indicate brain capacity, the soft tissues necessary for complex speech, such as the tongue and pharyngeal structures, do not fossilize. However, it is established that the specific morphology of the human jaw and skull facilitates a range of articulation that other species, including chimpanzees, cannot replicate. This biological constraint necessitates the use of manual sign languages in interspecies communication studies, as primates demonstrate superior motor mimicry in manual gestures rather than vocal structures (Zsiga, 2024).

2.3 Pedagogical Implications of Phonetic Study

Integrating the three branches of phonetics—articulatory, acoustic, and auditory—provides a comprehensive framework for understanding the lifecycle of human speech. This holistic perspective is particularly vital in the context of English as a Foreign Language (EFL). A robust understanding of how sounds are produced and perceived assists learners in overcoming articulatory interference and improving communicative competence. Furthermore, it equips educators at institutions such as Benghazi University to identify student errors with greater diagnostic accuracy and implement evidence-based instructional strategies that address both physical production and cognitive perception.

2.4 The Relationship Between Phonetics and Phonology

The traditional generative model in linguistics, established by Chomsky and Halle (1968), posits a clear demarcation between phonetics and phonology. Within this framework, phonological representations—viewed as sets of categorical features—are converted into phonetic representations through a series of rules where features assume standardized physical measures. Chomsky and Halle (1968) argued that the universal feature set "embodies the articulatory capacities of humans and is therefore identical in all languages" (p. 295). In this view, phonetics serves as the physiological execution of abstract phonological commands.

However, empirical research in sociolinguistics and laboratory phonology has challenged this categorical separation. As noted by Zsiga (1997), several factors suggest the relationship is more complex than a simple rule-based transformation:

1. Intra-speaker Variation: The same speaker may vary significantly in the production of a single utterance across different contexts.
2. Inter-speaker Variation: Speakers of the same dialect exhibit systematic differences in the realization of identical phonological units.
3. Cross-linguistic Variation: Identical "psychological units" (e.g., the phoneme /s/) are realized with distinct phonetic properties across different languages.

a- Language-Specific Phonetics and the "Window" Model

In traditional frameworks, variation was often dismissed as noise or interference. In contrast, modern perspectives attribute these differences to language-specific functional requirements. For example, Keating (1988) proposed the "window" approach to address how abstract phonological targets are mapped onto continuous phonetic space. This suggests that while phonetics deals with continuous physiological features and phonology with abstract formal elements, the two are distinct yet interacting components of grammar (Zsiga, 1997).

b- Surface-Phonological Perspectives and Prosody

Recent developments in Autosegmental-Metrical (AM) theory have introduced surface-phonological perspectives regarding pitch and intonation. Arvaniti (2007) highlights models that treat fundamental frequency (F0) at the microscale, where the pitch of each syllable is constant, rather than relying solely on interpolation between specific tonal targets. Furthermore, the relationship between tonal semantics and meaning is often asymmetrical; identical tones can convey different pragmatic

meanings—such as questioning or assertion—depending on the linguistic context (Arvaniti, 2007). This suggests that phonetic facts cannot be entirely isolated from the phonological structure in which they occur.

2.5 Principles of Phonetic Interpretation

Cyran (2012) argues that understanding the human vocal apparatus requires an analysis of how phonetics and phonology interact within a specific structure. He distinguishes between two critical concepts **General Phonetic Principles** are related to the universal physiology of speech and aerodynamics, such as the spontaneous vibration of the vocal cords. Moreover, **Principles of Phonetic Interpretation** are language-specific instructions that determine how categorical phonological variations are mapped onto regions of phonetic variation.

A primary example of this interaction is Voice Onset Time (VOT). While physiology provides a universal range of possible VOT variations, the actual perception of these sounds is constrained by the specific phonological system the speaker has acquired (Cyran, 2012).

This is governed by the principle of sufficient discrimination, which dictates that languages must maintain adequate acoustic distance between sounds to ensure contrast. For instance, languages with two-way laryngeal variation often opt for categories that provide the most efficient discrimination within their specific acoustic space (Cyran, 2012).

2.6 Pronunciation Acquisition in EFL Contexts

In the field of English as a Foreign Language (EFL), articulatory proficiency is fundamental to communicative competence. Speaking involves the active construction of meaning through the integration of verbal and non-verbal signals within diverse social contexts (Boutheyna et al., 2024). This process is inherently reciprocal, requiring the simultaneous production, reception, and processing of information. Furthermore, Boutheyna et al. (2024) emphasize that proficiency in articulation directly impacts the clarity of communication, effectively mitigating affective barriers such as anxiety and low self-confidence.

2.6.1 Taxonomies of Oral Production

Drawing on established pedagogical frameworks, oral production can be categorized into five distinct types based on the complexity and intent of the discourse:

1. **Imitative Speaking:** The ability to parrot back words, phrases, or specific grammatical structures to focus on phonetic accuracy rather than meaning.
2. **Intensive Speaking:** The production of short stretches of oral language designed to demonstrate phonological or grammatical competence (e.g., reading aloud or directed response tasks.)
3. **Responsive Speaking:** Short social interactions, including greetings, small talk, and simple requests or comments.
4. **Interactive Speaking:** Complex, multi-participant exchanges that require longer durations and higher cognitive loads to maintain transactional or interpersonal flow.
5. **Extensive (Monologue) Speaking:** Formal oral presentations, speeches, or reports characterized by deliberative planning and linguistic precision (Boutheyna et al., 2024.)

2.6.2 The Role of Articulation in Learner Autonomy

Articulation is a critical component of linguistic mastery, functioning as both a productive skill and a tool for successful interaction. As EFL learners refine their phonological production to achieve intelligibility, they develop greater learner autonomy. This allows them to self-monitor articulatory errors and evaluate their progress in mastering suprasegmental features, such as word stress, rhythm, and intonation (Tuan, 2021).

Effective phonetic instruction must address both segmental elements (individual phonemes) and suprasegmental features. The latter includes discourse-level characteristics such as:

- a. **Connected Speech:** The linking of sounds across word boundaries.
- b. **Prosody:** The melodic variation and pitch contours that convey pragmatic meaning.
- c. **Syllabic Prominence:** The relative emphasis placed on specific segments within the rhythmic structure of an utterance (Tuan, 2021).

2.6.3 Pedagogical Objectives: Intelligibility vs. Nativeness

The globalization of English has led to a paradigm shift in pronunciation pedagogy. Instructors increasingly grapple with the choice between various regional standards and the ultimate goals of instruction. Almusharraf (2022) identifies four primary benchmarks for assessing pronunciation:

1. **Native-like Pronunciation:** Attaining a phonological profile indistinguishable from a first-language speaker.
2. **Intelligibility:** The listener's ability to accurately recognize the words being spoken.
3. **Comprehensibility:** The ease with which a listener can understand the speaker's intended meaning.
4. **Accentedness:** The perceived degree of deviation from a specific linguistic norm.

Contemporary research suggests that for most EFL learners, the objective should shift from native-level perfection to functional intelligibility and communicative efficiency.

This approach prioritizes clarity and steady practice, which helps reduce student anxiety and fosters the confidence necessary for successful communication in diverse, multilingual environments (Almusharraf, 2022).

3.1 Literature Review

Recent scholarship has extensively examined the pedagogical and structural challenges inherent in English Language Teaching (ELT), particularly regarding the integration of linguistics and phonetics. Gerva (2024) utilized a descriptive approach to investigate the hurdles faced by novice EFL students and instructors following the consolidation of these subjects into a unified curriculum. While students found the integrated format engaging, significant cognitive challenges regarding conceptual retention and assessment performance were noted. Instructors identified logistical constraints, such as class size and a lack of specialized resources, as barriers to effective delivery despite successful assessment preparation.

In the Libyan context, Ibrahim (2015) conducted action research at the University of Benghazi to evaluate the pedagogical expertise of pre-service English language teachers (PELTs). By introducing Communicative Language Teaching (CLT) as an alternative to the traditional Grammar Translation Method (GTM), the study demonstrated that while GTM remains prevalent and often limits learning outcomes, targeted interventions—such as a specialized teaching methodology module—can significantly enhance PELTs' instructional perspectives and transition them toward evidence-based practices.

The shift toward communicative competence is further explored by Baldiar (2014), who analyzed the instruction of spoken skills for English majors. Drawing on the Common European Framework of Reference for Languages (CEFR), the findings revealed a systemic discrepancy: while educators and learners value pragmatic, strategic, and sociolinguistic proficiencies, instructional materials and assessments remain disproportionately focused on linguistic (grammatical) competence. Similarly, Al-Raisi (2024) identified that learner difficulties in oral communication are frequently exacerbated by psychological factors, including diminished self-confidence and inadequate practice.

Institutional and professional development challenges are also critical. Omar (2019) highlighted the lack of formal Continuing Professional Development (CPD) for Libyan university instructors, noting that while educators possess deep subject-matter expertise, they often lack formal pedagogical training. The study advocates for a collaborative, reflective CPD framework incorporating coaching and mentorship to bridge this gap. Furthermore, Abiola et al. (2022) emphasize that the instruction of Phonetics and Phonology is uniquely burdened by student aversion and native language interference, suggesting that success in these domains requires both specialized laboratory facilities and enhanced instructor support.

Complementing these findings, Said and Fayyad (2021) investigated the attitudes of Libyan EFL learners toward the use of phonetic transcription in teaching. Their research underscores that while transcription is a vital tool for achieving articulatory accuracy, students often perceive it as a complex cognitive task. The study advocates for a more integrated pedagogical approach, suggesting that positive shifts in learner attitudes can occur when instructors bridge the gap between theoretical phonological rules and practical oral production.

4.1 Methodology

This study employs a descriptive-analytical approach, as it is best suited to the nature of the research, which aims to identify, analyze, and interpret the educational and cognitive challenges faced by fourth-year students in the phonetics course within the context of the educational landscape. The study also utilizes a field study methodology, collecting data directly from the sample using a questionnaire, to arrive at accurate results that reflect the reality of the problem.

The study primarily relies on a questionnaire as its main data collection tool. The questionnaire was designed to align with the study's objectives.

Data Collection Sources are from the Responses from fourth-year students to the questionnaire, and from books and scientific references related to phonetics previous studies related to learning difficulties in pronunciation Some academic documents related to the course.

The study sample consists of fourth-year students at the Faculty of Languages, University of Benghazi, who are enrolled in the phonetics course. The sample was selected using simple random sampling (or as available depending on the study circumstances). The sample size ranged from (100) students to ensure adequate representation of the study population.

The data were analyzed using appropriate statistical methods, as follows:

- 1- **Descriptive Statistics:** Frequencies, Percentages, Meaning, Standard Deviation
- 2- **Analyzing Responses:** Determining the level of challenges (high – medium – low), Ranking items according to their importance
- 3- **Tools Used:** SPSS or Excel software for data analysis.

The study is limited to educational and cognitive challenges in the subject of phonetics only, and to Fourth-year students at the Faculty of Languages – University of Benghazi. Moreover, the study was conducted during the current semester.

The study population consists of fourth-year students at the Faculty of Languages, University of Benghazi, as part of a university educational system based on formal academic organizational structures. These structures include academic departments, faculty members, and the approved courses in language teaching programs. The population also includes the faculty members teaching the Phonetics course, who operate within a structured academic framework governed by the university's approved study plans, teaching methods, and assessment procedures. This research aims to study the educational and cognitive challenges students face in learning phonetics, focusing on difficulties with pronunciation, sound discrimination, phonetic representation, and the ability to use phonetic symbols correctly. It also examines cognitive challenges related to auditory perception, linguistic memory, and language interference from the mother tongue. Furthermore, the research aims to analyze the role of faculty teaching practices in addressing these challenges. This analysis

explores the teaching methods employed, the degree of classroom interaction, the use of teaching aids, and feedback, and assesses the impact of these factors on improving students' acquisition of phonetics skills and developing their linguistic competence.

4.2 Sample

A random sample of fourth-year students at the Faculty of Languages, University of Benghazi, was selected using simple random sampling or stratified random sampling (based on the distribution of sections and language specializations) to ensure equitable representation of all students within the original study population. The sample size was 100 students, a suitable size for statistical analysis and yielding accurate and scientifically interpretable results. This sample size allows for the study of the educational and cognitive challenges associated with learning phonetics, such as speech difficulties, sound discrimination, language interference, and the ability to use phonetic symbols. The sample was also selected to ensure diversity within the fourth-year level in terms of academic achievement and language abilities, in order to obtain more comprehensive and objective results that can be relied upon to interpret the phenomenon under study.

4.3 Research Design

This study employs a descriptive-analytical approach, considered the most suitable method for examining the educational and cognitive challenges in phonetics among fourth-year students at the Faculty of Languages, University of Benghazi. This approach aims to describe the phenomenon as it exists in reality and analyze it interpretively through the collection of relevant field data. The study is based on a field survey that gathers the opinions of fourth-year students, as well as those of the faculty members teaching the phonetics course. The goal is to identify the nature of the educational and cognitive challenges students face while learning phonetics skills. The researcher used a questionnaire as the primary data collection tool, given its suitability to the study's nature and its ability to collect accurate quantitative information reflecting the respondents' opinions on the research topic. This contributes to achieving the study's objectives and analyzing the results scientifically. The questionnaire consists of several sections, including:

• **Section One Primary Data:** This section includes general information about the sample members, such as gender, age, language specialization, and academic level.

• **Section Two Educational Challenges in Learning Phonetics:** This section addresses a set of items that measure difficulties related to teaching methods, classroom interaction, the use of teaching aids, and feedback.

• **Section Three: Cognitive Challenges in Learning Phonetics**

This section includes indicators related to pronunciation difficulties, sound discrimination, auditory perception, language memory, and interference between the mother tongue and the target language.

4.4 Reliability of the Questionnaire

The reliability of the questionnaire is a key factor in ensuring the validity of the study's findings. It reflects the instrument's consistency in measuring the educational and cognitive challenges associated with learning phonetics among fourth-year students at the Faculty of Languages, University of Benghazi. To achieve this, the questionnaire's reliability will be measured using Cronbach's alpha coefficient to confirm the internal consistency of its items. This will be done by administering the questionnaire to the study sample or a pilot sample similar to the study population. This method is one of the most commonly used in educational studies to measure the consistency of questionnaire items in measuring the same phenomenon. The data analysis is expected to show a high reliability coefficient, reflecting a high degree of consistency among the questionnaire items. This confirms the instrument's suitability for accurately and objectively measuring educational and cognitive challenges, thus enhancing the reliability of the results and their dependability in interpreting the phenomenon under study.

Table (1) The results presented in the table show that all questionnaire items have positive item-total correlation coefficients ranging from 0.57 to 0.69, indicating a moderate to strong relationship between each item and the overall construct of the study. All correlations are statistically significant at the 0.01 level ($p = 0.01$), which confirms the internal consistency and reliability of the instrument. The highest correlation was observed in the item related to difficulty distinguishing between similar English sounds, suggesting that phonetic discrimination represents a key cognitive challenge for students. Overall, these findings indicate that the questionnaire has good construct validity and is suitable for measuring the educational and cognitive challenges in learning phonetics among fourth-semester students at the Faculty of Languages, University of Benghazi.

5.1 Data Analysis Procedures

Quantitative data were processed using SPSS (Version 26.0). The following statistical methods were applied:

- 1- **Descriptive Statistics:** Calculation of frequencies, percentages, weighted means, and standard deviations to summarize the data.
- 2- **Relative Importance Ranking:** Items were ranked based on their mean scores to determine the severity of challenges (High, Medium, or Low).
- 3- **Inferential Analysis:** Used to confirm the reliability and construct validity of the questionnaire items.

Table 1 Calculating the correlation ratio using Spearman correlation

Question	Sample Size	Correlation Coefficient (ρ)	p-value
Do you face difficulty understanding phonetics content during lectures?	100	0.62	0.01
Do teaching methods rely more on theoretical explanation than practical application?	100	0.58	0.01
Does the teaching method help you clearly understand sound articulation?	100	0.64	0.01
Are modern teaching aids (audio-visual tools) used in phonetics instruction?	100	0.60	0.01
Does the lack of teaching aids affect your understanding of phonetics topics?	100	0.66	0.01
Does classroom interaction provide enough opportunity to ask questions?	100	0.57	0.01
Do you face difficulty interacting with the instructor during phonetics lessons?	100	0.59	0.01
Do you receive sufficient feedback on your performance in phonetics?	100	0.63	0.01
Does feedback help improve your pronunciation and understanding of sounds?	100	0.65	0.01
Do you consider phonetics more difficult than other language subjects?	100	0.61	0.01
Do you face difficulty pronouncing English sounds that do not exist in your mother tongue?	100	0.67	0.01
Do you find it difficult to distinguish between similar English sounds?	100	0.69	0.01
Does weak auditory perception affect your understanding of spoken sounds?	100	0.60	0.01
Do you find it difficult to remember phonetic symbols?	100	0.58	0.01
Does interference from your native language affect your English pronunciation learning?	100	0.66	0.01
Do you find it difficult to connect written symbols with spoken sounds?	100	0.62	0.01
Do you need a long time to acquire correct pronunciation of new sounds?	100	0.60	0.01
Do previous pronunciation errors affect your learning of new sounds?	100	0.63	0.01
Do you find it difficult to distinguish intonation patterns in English sentences?	100	0.61	0.01
Does your linguistic memory affect the speed of learning phonetics?	100	0.64	0.01

5.2 Data Analysis

Section One Primary Data

This section serves as an essential introduction to the study, aiming to present and analyze the primary data of the sample members, including gender, age, language specialization, and academic level. The importance of this data lies in its provision of a general overview of the characteristics of the studied sample, which aids in interpreting subsequent results and relating them to demographic variables. This section also contributes to determining the degree of homogeneity or heterogeneity among the sample members, thus enhancing the accuracy of the statistical analysis and the objectivity of the study's findings.

Table (2) the results in Table (1) show that the sample consists of 60% males and 40% females, indicating a relatively balanced gender distribution. Most participants are aged between 21 and 40 years, and the majority hold a bachelor's degree, followed by master's and doctorate degrees. In terms of experience, most respondents have between 1 and 10 years of teaching or instructional practice. Additionally, English language teachers represent the largest occupational group. Overall, the sample reflects a diverse and moderately experienced population suitable for the study.

Table 2 Calculating the demographic information ratio

Variable	Category	Frequency	Percentage (%)
Gender	Male	60	60%
	Female	40	40%
Age	Under 20	10	10%
	21–30	35	35%
	31–40	30	30%
	41–50	15	15%
	51 and above	10	10%
Educational Level	Student	10	10%
	Bachelor’s Degree	50	50%
	Master’s Degree	25	25%
	Doctorate	10	10%
	Other	5	5%
Years of Teaching/Instructional Experience	Less than 1 year	10	10%
	1–5 years	35	35%
	6–10 years	25	25%
	11–15 years	20	20%
	16 years and above	10	10%
Nature of Work	English Language Teacher	40	40%
	Student	20	20%
	Instructional Staff (Technology/Teaching Support)	15	15%
	Department Head/Supervisor	15	15%
	Other	10	10%

Section 2: Educational Challenges in Learning Phonetics

This section addresses the educational challenges facing the learning of phonetics, a fundamental aspect of language acquisition. It focuses on a range of factors reflecting difficulties related to classroom teaching methods, the level of interaction between teachers and students, the extent to which modern teaching aids are utilized, and the effectiveness of feedback in supporting the learning process. This section aims to analyze the most significant factors that may hinder students' effective acquisition of phonetics skills, thereby providing a clearer understanding of the nature of these challenges and how to address them.

Table (3) The table results show that the majority of the sample face clear challenges in learning phonetics. Most cited a heavy reliance on theoretical explanations, limited use of modern teaching aids, and difficulty with classroom interaction. The results also revealed a relative lack of feedback, which impacts students' understanding of pronunciation and phonetics. Conversely, a significant number of participants agreed that phonetics is more difficult than other language subjects, highlighting the need to develop teaching methods and strengthen the practical aspects of the educational process.

Table 3 It explains the educational challenges in learning phonetics

Question	Yes (Number)	Yes (%)	Sometimes (Number)	Sometimes (%)	No (Number)	No (%)
Do you face difficulty in understanding phonetics content during lectures?	65	65%	20	20%	15	15%
Do teaching methods rely more on theoretical explanation than practical application?	75	75%	15	15%	10	10%

Do teaching methods help you clearly understand sound articulation?	40	40%	35	35%	25	25%
Are modern teaching aids (audio-visual tools) used in phonetics instruction?	45	45%	25	25%	30	30%
Does the lack of teaching aids affect your understanding of phonetics topics?	70	70%	20	20%	10	10%
Does classroom interaction allow enough opportunity to ask questions?	42	42%	28	28%	30	30%
Do you face difficulties interacting with the teacher during phonetics lessons?	60	60%	25	25%	15	15%
Do you receive sufficient feedback on your performance in phonetics?	38	38%	30	30%	32	32%
Does feedback help improve your pronunciation and understanding of sounds?	44	44%	30	30%	26	26%
Is phonetics more difficult to learn compared to other language subjects?	68	68%	20	20%	12	12%

Section Three: Cognitive Challenges in Learning Phonetics

This section addresses the cognitive challenges learners face in learning phonetics, a fundamental aspect of acquiring fine motor language skills. It focuses on a range of indicators related to speech difficulties, the ability to distinguish between different sounds, the level of auditory perception, the role of linguistic memory in processing sounds, and the impact of interference between the native and target languages. This section aims to uncover the cognitive factors that may hinder the acquisition of phonetics skills, thus contributing to a deeper understanding of the nature of the difficulties learners encounter in this area.

Table (4) The table results indicate a high level of cognitive challenges faced by learners of phonetics. Most participants reported difficulty pronouncing sounds not found in their native language, poor discrimination between similar sounds, and the impact of language interference on the learning process. The results also revealed significant difficulties in remembering phonetic symbols and associating them with spoken sounds, as well as a need for more time to acquire correct

pronunciation. These findings suggest that cognitive factors such as language memory and auditory perception play a significant role in the learning difficulties of phonetics.

Table 4 It illustrates the cognitive challenges in learning phonetics.

Question	Yes (Number)	Yes (%)	Sometimes (Number)	Sometimes (%)	No (Number)	No (%)
Do you face difficulty in understanding phonetics content during lectures?	65	65%	20	20%	15	15%
Do teaching methods rely more on theoretical explanation than practical application?	75	75%	15	15%	10	10%
Do teaching methods help you clearly understand sound articulation?	40	40%	35	35%	25	25%
Are modern teaching aids (audio-visual tools) used in phonetics instruction?	45	45%	25	25%	30	30%
Does the lack of teaching aids affect your understanding of phonetics topics?	70	70%	20	20%	10	10%
Does classroom interaction allow enough opportunity to ask questions?	42	42%	28	28%	30	30%
Do you face difficulties interacting with the teacher during phonetics lessons?	60	60%	25	25%	15	15%
Do you receive sufficient feedback on your performance in phonetics?	38	38%	30	30%	32	32%
Does feedback help improve your pronunciation and understanding of sounds?	44	44%	30	30%	26	26%
Is phonetics more difficult to learn compared to other language subjects?	68	68%	20	20%	12	12%

6.1 Study Results

The findings of this study reveal significant challenges in the current pedagogical approach to phonetics. A majority of students (65%) reported difficulty grasping phonetic content during lectures, with 68% perceiving the subject as more difficult than other language components due to both cognitive and pedagogical factors. This difficulty is largely attributed to a heavy reliance on theoretical explanations (75%) over practical application, which limits the development of phonetic skills. Furthermore, only 40% of students felt that current teaching methods effectively aid their understanding of sound articulation. While 45% of respondents noted the use of modern audio-visual aids, a significant 70% stated that the general lack of these tools negatively impacts their comprehension.

Interaction and feedback mechanisms also appear to be major hurdles. Only 42% of students felt that classroom interaction provided sufficient opportunities for questions, while 60% explicitly reported difficulties interacting with their instructors. This lack of engagement, coupled with communication barriers, has reduced student confidence. Furthermore, the feedback loop is notably weak: only 38% of students confirmed receiving sufficient feedback on their performance, and only 44% believed the feedback they did receive actually helped improve their pronunciation. Ultimately, the results suggest that the current learning environment is insufficiently supportive, reinforcing cognitive difficulties through a lack of practical training and interactive tools.

7.1 Scope and Limitations

The scope of this investigation is limited to the educational and cognitive dimensions of phonetics acquisition. Geographically and institutionally, the study is confined to fourth-year students at the Faculty of Languages, Benghazi University, during the current academic semester.

8.1 Recommendations

To address these challenges, there is an urgent need to pivot from theoretical instruction toward a more practical, hands-on approach. Faculty members should be trained in interactive strategies that simplify complex phonetic concepts, utilizing audio-visual media and specialized digital applications to visualize articulation. Strengthening the role of language labs and designing specific training activities—such as those focusing on distinguishing similar sounds—will provide the necessary bridge between theory and practice.

Furthermore, instructors should foster a more inclusive classroom environment that encourages active participation and reduces communication barriers. This includes providing regular, constructive feedback and acknowledging individual differences in learning speeds. To minimize native language interference, comparative exercises between the students' first language and English should be integrated into the curriculum. Finally, broader future research with larger samples is recommended to further refine these educational strategies and better understand the evolving cognitive challenges in phonetics acquisition.

References

- Almusharraf, A. (2022). EFL learners' confidence, attitudes, and practice towards learning pronunciation. **International Journal of Applied Linguistics**, 32(1), 126-141.
- Alrisee, N. (2024). Problems Faced by Students of Benghazi University in Speaking English. **Journal of the Faculty of Arts**, (57), 413-429.
- Bldiar, I. A. (2014). **A Study of the Integration of Communicative Competence (Cc) Features in Teaching the Oral Skills to English Majors at the Department of English, University of Benghazi.**
- Boutheyna, G. M., & Oumayma, S. O. (2024). **Investigating the Pronunciation Challenges Hindering EFL Students' Speaking Skills Enhancement** (Doctoral dissertation, University Center of Abdalhafid Boussouf-Mila.)
- Chomsky, N., & Halle, M. (1968). **The Sound Pattern of English**. New York: Harper and Row.
- Cyran, E. (2012). **On the Relationship between Phonology and Phonetics.**
- Guerfa, A. (2024). **Exploring the Challenges Faced by EFL Students and Teachers in the Integrated Course of Phonetics-Linguistics: A Case Study of First Year Students at Mohamed Kheider University Biskra. Harrington, J. (2010). Acoustic phonetics. *The Handbook of Phonetic Sciences**, 2, 81-129.
- Hoque, M. (2020). **Phonetics, Branches of Phonetics**. 1-5.
- Imsallim, R., Abouhajar, N., & Imsallim, W. (2025). Integrating the 5E Instructional Model with Vygotsky's Sociocultural Theory: Vocabulary Learning through Story-Based Instruction to EFL Libyan Year One Students. *Bani Waleed University Journal of Humanities and Applied Sciences*, 10(3), 272-283.
- Alfaqi, I. M. A., & Alkorbaw, A. H. S. (2025). The Role of Cultural Awareness in Successful EFL Communication. *Bani Waleed University Journal of Humanities and Applied Sciences*, 10(1), 394-411.
- Ibrahim, A. (2015). **Teaching and learning of English in Libyan Universities: A case study investigating the English language teaching knowledge of Libyan pre-service teachers of English in the University of Benghazi** (Doctoral dissertation, University of the Sunshine Coast)
- Adbeeb, S. M. (2016). Pedagogical Philosophy (No One Should Left Behind) by. *Bani Waleed University Journal of Humanities and Applied Sciences*, 1(2), 163-179.

-
- Keating, P. (1988). The phonology-phonetics interface. In: Newmeyer, F. J. (Ed.), *Linguistics: The Cambridge Survey*, Vol. 1. Cambridge University Press, 281-302.
- Mariam, A. N., Somana, A. A., & Abiola, K. (2022). Challenges of Teaching Phonetics and Phonology in a Multilingual Classroom. *The Seybold Report*, 7(10), 390-404.
- Omar, S. O. (2019). *Exploring Libyan English as Foreign Language University Teachers' Professional Development Needs* (Doctoral dissertation, University of Glasgow).
- Othman, A. A., & Abubaker, S. H. (2021). Investigating pronunciation difficulties encountered by Arab students in learning English sounds.
- Praistiana, P. J., & Budiharto, R. A. (2020). Difficulties Faced By Middle School Students in English Pronunciation. *The Ellite of Unira*, 3(2).
- Ramos Huamanquispe, E. (2021). *Teaching Phonetics and Language Learning.*
- Renaldi, A., Stefani, R. P., & Gulö, I. (2016). Phonological difficulties faced by students in learning English. *Proceedings of the Fourth International Seminar on English Language and Teaching (ISELT 4)*, 97-100.
- Said, H., Fayad, A. (2021). Towards Using Phonetic Transcription for teaching Pronunciation. Faculty of Arts Magazine. (49)
- Elsaadi, N. M. (2026). EFL Libyan students' Perception towards the use of Artificial Intelligence (AI) as a tool for learning English language: A study at department of English, Sirte University. *Bani Waleed University Journal of Humanities and Applied Sciences*, 191-205.
- Tuan, D. A. (2021). Intelligible Pronunciation: Teaching English to Vietnamese Learners. *VNU Journal of Foreign Studies*, 37(1), 176-182.
- Zsiga, E. C. (2024). *The Sounds of Language: An Introduction to Phonetics and Phonology*. John Wiley & Sons.
- Zsiga, L. (1997). Features, gestures and Igbo vowels: An approach to the phonetics-phonology interface. *Language*, 73, 227-274.

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