THE USE OF VOCAL VIBRATIONS TO IMPROVE ENGLISH PRONUNCIATION FOR DHH LEARNERS

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ABSTRACT

Teaching English pronunciation to Deaf and Hard of Hearing (DHH) students remains challenging, especially given limited access to auditory input and the need to adapt teaching methods to students' conditions. Although previous studies have highlighted the importance of multisensory approaches, there is still a limited explanation of how tactile techniques, such as vocal vibration, are used in real classroom situations. This study aims to explore the challenges teachers face, the strategies they use, and how the vocal vibration technique is implemented in teaching pronunciation. This research used a descriptive qualitative design and was conducted in a senior high school in Pekalongan, involving one class of 20 DHH students. The data were collected through classroom observations and teacher interviews and analyzed through thematic analysis, including coding, categorization, and interpretation. The results show that students have difficulties in perceiving sounds, monitoring their own pronunciation, and controlling their articulation. To address these challenges, teachers use repetition, multisensory strategies, and tactile techniques. The vocal vibration technique helps students improve their awareness of how sounds are produced, their pronunciation accuracy, and their class participation. However, the results vary depending on each student's hearing level. Therefore, flexible and adaptive teaching approaches are needed to support pronunciation learning for DHH students.

Keywords: vocal vibration, pronunciation learning, deaf and hard-of-hearing, English pronunciation, inclusive education

ABSTRAK

Pengajaran pengucapan bahasa Inggris kepada siswa Tuli dan Tunarungu (DHH) tetap menjadi tantangan, terutama mengingat akses terbatas terhadap input auditori dan kebutuhan untuk menyesuaikan metode pengajaran dengan kondisi siswa. Studi sebelumnya telah menekankan pentingnya pendekatan multisensori, penjelasan mengenai penggunaan teknik taktil, seperti *vocal vibration*, dalam situasi kelas nyata masih terbatas. Penelitian ini bertujuan untuk mengeksplorasi tantangan yang dihadapi guru, strategi yang digunakan, serta implementasi teknik *vocal vibration* dalam pengajaran pengucapan. Penelitian ini menggunakan desain kualitatif deskriptif dan dilakukan di sebuah SMA di Pekalongan, melibatkan satu kelas dengan 20 siswa DHH. Data dikumpulkan melalui observasi kelas dan

wawancara guru, kemudian dianalisis melalui analisis tematik, termasuk pengodean, kategorisasi, dan interpretasi. Hasil penelitian menunjukkan bahwa siswa mengalami kesulitan dalam memahami suara, memantau pengucapan mereka sendiri, serta mengontrol artikulasi mereka. Untuk mengatasi tantangan ini, guru menggunakan pengulangan, strategi multisensori, dan teknik taktil. Teknik *vocal vibration* membantu siswa meningkatkan kesadaran tentang cara produksi suara, akurasi pengucapan, serta partisipasi mereka di kelas. Namun, hasilnya bervariasi tergantung pada tingkat pendengaran masing-masing siswa. Oleh karena itu, pendekatan pengajaran yang fleksibel dan adaptif diperlukan untuk mendukung pembelajaran pengucapan bagi siswa DHH.

Kata Kunci: getaran vokal, pembelajaran pengucapan, tuli dan tunarungu, pengucapan bahasa Inggris, pendidikan inklusif

A. Introduction

English pronunciation remains one of the most challenging aspects of learning English for Deaf and Hard of Hearing (DHH) learners due to limited access to auditory feedback, which plays a central role in phonological development. According to Monsen (Monsen, 1976), deaf teens typically exhibit a more constrained English vowel space than their hearing counterparts, largely due to restricted movement in the second formant (F2). This reduction is strongly associated with lower speech intelligibility and reflects limitations in auditory feedback, as well as difficulties in recognizing articulatory movements (Monsen, 1976).

Previous studies indicate that DHH learners predominantly rely on visual articulatory cues when producing English speech sounds Anggraeni et al., (2023). According to these authors, learners with partial hearing loss are more successful at approximating vowel production than consonant production. In contrast, sounds involving internal articulators, such as alveolar and velar consonants, remain particularly difficult. Meanwhile, learners with profound hearing loss demonstrate limited syllable production and reduced consonant realization.

English language instruction for DHH learners has mostly focused on visual-based and clear instructional tactics to address these difficulties. Research by Ay & Şen Bartan, (2022) suggests that effective English instruction for DHH children should include visualization, repetition, and phonics instruction. They also

recommend using multimodal tools such as lip reading, sign language, and technology-supported materials. A study conducted in a classroom found that English teachers frequently utilize repetition and visualization to help deaf students improve their vocabulary and comprehension Heriyanti et al., (2023). Studies from inclusive and special education settings, however, indicate that while these strategies promote the growth of literacy and receptive language abilities, there is still little improvement in spoken pronunciation and oral intelligibility (Bedoin, 2011; Mv & Gill, 2024).

Given these limitations, recent studies have explored whether tactile and embodied approaches, such as vocal vibration techniques, may provide alternative pathways for supporting pronunciation development among DHH learners. Chan, (2018) argues that pronunciation learning is an embodied process involving proprioception, articulatory awareness, tactile feeling, and auditory perception. Supporting this view, Cieśla et al., (2024) suggest that audio-tactile speech training enhances multisensory and sensorimotor connectivity related to speech processing. In applied technological contexts, according to Sharon et al., (2025), real-time vibrotactile feedback improves phoneme-level articulation and pronunciation accuracy among individuals with speech and hearing impairments.

However, vocal vibration–based techniques can improve certain aspects of English pronunciation, particularly articulatory awareness and phoneme production. Nevertheless, qualitative and ethnographic research raises concerns regarding the broader pedagogical implications of oral-oriented pronunciation instruction Modern, (2025). Montiegel, (2023) demonstrates that institutional emphasis on vocalization in oral-oriented classrooms often positions “using one’s voice” as a normative expectation, which may place pressure on DHH learners regardless of their communicative preferences or comfort. Similarly, studies examining the lived experiences of DHH learners in English language education suggest that oral-focused practices can lead to discomfort, anxiety, and resistance, particularly among learners who identify more strongly

with visual or signed modes of communication (Rezvani et al., n.d., 2025).

Pronunciation education for DHH students poses significant challenges for teachers, making vocal vibration techniques particularly relevant for helping students perceive and produce speech sounds more effectively Ay & Şen Bartan, (2022). However, in practice, many English teachers prioritize reading and writing skills, as they lack specialized training in deaf education and often consider speaking and listening instruction unfeasible Bedoin, (2011). Similar limitations have been documented in other educational settings, where instructors point to inadequate institutional support, communication difficulties, and a lack of pedagogical expertise as hurdles to successful pronunciation instruction (Linusi & Amin, 2022).

Furthermore, sign language still plays a supporting role in English training that emphasizes pronunciation, despite being universally acknowledged as a complete and natural language for Deaf and hard-of-hearing individuals. According to Nover et al., (1998), proficiency in sign language should serve as a linguistic basis for the development of literacy and, when applicable, for the acquisition of spoken language. However, many pronunciation-focused methods still emphasize oral outcomes without fully incorporating sign language, which could reinforce oral-centric teaching standards.

Taken together, existing studies suggest that vocal vibration–based techniques hold promise for supporting certain aspects of English pronunciation among DHH learners. However, little is known about how vocal vibration techniques are implemented and experienced in real EFL classroom contexts, particularly from both teacher and DHH learner perspectives. Specifically, how teachers and DHH learners view the use of vocal vibration techniques in terms of comfort, practicality, and pedagogical value, or how such techniques are negotiated alongside sign language within a multimodal instructional framework, has received relatively little attention in previous research.

Based on this context, this study explores the implementation of vocal vibration techniques in English pronunciation instruction for DHH

learners, focusing on instructional practices, challenges, and perceived effectiveness from both teacher and student perspectives.

B. Method

This study employed a classroom-based qualitative descriptive design to investigate how teachers implement pronunciation instruction for Deaf and Hard of Hearing (DHH) students using vocal vibration techniques. This approach was chosen because it allows an in-depth understanding of teachers' practices and students' responses in their natural classroom context. Qualitative research emphasizes interpreting participants' experiences and instructional strategies rather than relying on statistical measurement or experimental testing of effectiveness (Creswell & Creswell, 2018).

The subjects of this study included an English teacher who applied vocal vibration techniques to pronunciation learning and 20 students from a single class at a special education high school in Pekalongan. Several of the students were Deaf and Hard of Hearing (DHH), while others had diverse learning needs reflecting a heterogeneous classroom. They were selected purposively based on their active participation in the pronunciation-learning activities and willingness to engage with the teacher's strategies (Creswell & Creswell, 2018).

Data collection in this study was conducted through semi-structured interviews and classroom observations. The research instruments consisted of interview guides and observation sheets developed by the researcher based on (Creswell & Creswell, n.d.) qualitative research framework, adapted to the research problem. The interviews with the English teacher focused on background information, teaching experience with DHH students, challenges in pronunciation instruction, implementation of the vocal vibration technique, and student responses during pronunciation activities. Classroom observations focused on four main indicators: behavioral participation, phonetic awareness, emotional responses, and signs of discomfort during pronunciation activities. The observation sheet included structured indicators rated on a five-point scale to capture the frequency of observed behaviors, which were interpreted

descriptively to support qualitative analysis. These observations were used to supplement the interview data and capture students' responses in natural learning situations (Creswell & Creswell, n.d.).

Data were analyzed using thematic analysis procedures, including data reduction, coding, categorization, and interpretation (Creswell & Creswell, 2018). Interview transcripts and observation notes were first organized and coded to identify recurring patterns, which were then grouped into themes related to instructional strategies, student responses, and perceived effectiveness.

C.Findings and Discussion

Challenges in Teaching Pronunciation to Deaf Students

Research findings indicate that students experience fundamental difficulties in understanding and distinguishing speech sounds due to limitations in their hearing abilities. Teachers explain that students often struggle to recognize subtle phonemic differences, which leads to pronunciation errors. It shows that access to auditory input is not merely a supporting factor but a fundamental element in phonological development. The lack of auditory input not only affects the learning process but also alters how students with hearing impairments construct and access sound representations. Consequently, students must rely on alternative sensory pathways to compensate for these limitations. This statement is consistent with the findings revealed by Hall et al., (2017), which emphasize that limited auditory exposure significantly impacts the development of language and phonology in deaf and hard-of-hearing students.

Moreover, students also struggle to monitor their own pronunciation. Teachers noted that students often do not know whether their pronunciation is correct because there is no direct auditory feedback. This indicates that the process of self-monitoring in pronunciation learning becomes dependent on external factors, rather than on internal regulation. In this case, students cannot rely on their ability to hear their own voices to make corrections. The statement aligns with (Creswell & Creswell, n.d.) who note that various factors, including residual hearing and external support, influence language development in individuals with hearing impairments.

Another challenge, as the teacher explained, is that many students require more time and intensive repetition to achieve accurate pronunciation, as they need to control the movements of their tongues and mouths consciously. That statement indicates that pronunciation instruction for deaf students involves not only cognitive aspects but also includes fairly complex motor elements. The same point is noted by Tiwari, (2024), explains that speech production involves complex articulatory mechanisms, therefore requires proper guidance. In other words, Chan, (2018) underline that continuous practice is necessary to develop speaking coordination.

The teacher also noted that students' hearing loss ranged from moderate to severe (approximately 70–100 dB), which affected their engagement and responses during pronunciation activities. Variations like these show that deaf students cannot be viewed as a homogeneous group. Knoors & Marschark, n.d., (2014) emphasize that differences in hearing levels, language experience, and cognitive development create various learning needs. As a result, pronunciation instruction must be tailored to each student's individual circumstances.

These challenges highlight the need to develop learning strategies that go beyond conventional auditory-based approaches. To help students overcome these limitations, teachers employ a variety of adaptive and multisensory strategies that support the development of their pronunciation.

Multisensory Learning Strategies

To address the various challenges students face, teachers use repetition as a primary strategy in pronunciation instruction. The repetition is not merely a mechanical activity but serves to replace the role of auditory feedback, which typically aids the learning process. Students who can hear tend to correct their mistakes through listening and self-correction. For deaf students, however, repetition becomes the primary method for practicing articulation control in the absence of sufficient auditory feedback.

The continuous repetition of sounds and words gradually allows students to develop the motor skills needed for speech. In this process, students will build an articulatory

memory that enables them to understand how sounds are produced through the coordination of the mouth, tongue, and throat, rather than relying solely on auditory input. According to Chan, (2018) the explanation, the development of speech requires consistent practice, while Knoors & Marschark, (2014) emphasizing that structured, repeated exposure is crucial for supporting the development of spoken language in deaf students. With that, repetition serves as a bridge between perception and speech production.

Repetition also reflects the principles of the Maternal Reflective Method (MMR), which emphasizes language learning through imitation and repeated interaction. Pronunciation instruction is conducted gradually and repeatedly, with students not being pressured to achieve accuracy immediately, but rather through a process of continuous refinement. As noted by Fitria & Hardiyantari, (2021), the method supports the development of receptive and expressive language through targeted practice. It describes how pronunciation instruction is carried out in stages and requires an ongoing process.

Teachers also employ a multisensory approach by integrating visual and gestural cues such as mouth movements, facial expressions, and sign language in addition to repetition. This approach is not merely supplementary but is an essential component of the learning process, given the students' limited auditory access. (Emmorey, 2002) highlights that visual cues play a crucial role in helping deaf students understand language. A multisensory approach reflects a shift from auditory-focused learning to learning that engages both visual and physical senses. A vocal vibration learning strategy focuses not only on sounds but also on how students understand and produce language through various sensory cues.

Implementation of Vocal Vibration Technique

The study found that vocal vibration is used as a tactile strategy to help students understand the process of speech production. In practice, students are asked to place their hands on the teacher's throat while the teacher produces specific sounds, allowing students to feel the vibrations and visualize sounds that cannot be perceived through hearing

alone. Vocal vibration technique can be understood as a form of sensory support, in which tactile input compensates for limitations in auditory perception. For students who are deaf or hard of hearing, this experience offers an alternative way to understand the characteristics of sound, supported by Cieśla et al., (2024) who explains that tactile experiences can enhance sensitivity to sound production, thereby helping students identify correct pronunciation.

In addition, teachers also combine tactile input with visual cues, such as lip movements and facial expressions. The inclusion of these additional visual cues demonstrates that the success of the vocal vibration technique lies in integrating various sensory cues to support learning. Hall et al., (2017) emphasize that DHH learners rely heavily on non-auditory input, including visual support, to access and understand language. The use of this technique makes pronunciation instruction more tangible and easier to understand. Students are not only asked to imitate the sounds, but also to experience firsthand how those sounds are produced, making the learning process more meaningful.

The vocal vibration technique makes pronunciation instruction more tangible and easier to understand. Students are not only asked to imitate sounds but also to directly experience how those sounds are produced, making the learning process more meaningful. The use of this technique also influences how students respond to the learning process, as reflected in the varying levels of their engagement.

Student Responses and Limitations

Classroom observations indicate that students' responses to the vocal vibration technique were varied. Some students showed increased engagement and participation in pronunciation activities. Their curiosity and interest in tactile experiences of vocal vibration indicate that this technique can make learning more interactive and accessible. Supported by Sharon et al., (2025), that articulatory stimulation can strengthen the connection between sensory experience and speech production, thereby helping to improve pronunciation skills. However, not all students respond in the same way.

Some students need more time to adapt and engage in learning activities. Individual factors, such as self-confidence, readiness to learn, and degree of hearing loss, also influence their level of engagement. As noted in Knoors & Marschark, (2014) deaf students have diverse characteristics, and thus their responses to learning also vary.

Differences in response also illustrate how each student responds to the vocal vibration technique in different ways. Some students may adapt more quickly and engage actively, while others may take longer or respond differently, depending on their individual circumstances and needs. In addition, vocal vibration techniques need to be tailored to each student's individual needs. According to (Monikowski, 2004) emphasizes the importance of using various forms of input to support language learning among deaf students. Alternatively, Florian & Pantić, (2017) highlighted the importance of an inclusive and flexible approach to learning.

Overall, teaching pronunciation to deaf students requires an adaptive and responsive approach. The vocal vibration technique can be an effective strategy, but it needs to be combined with other methods to meet diverse learning needs.

D. Conclusion

This study considers how vocal vibration techniques can support the teaching of English pronunciation for Deaf and Hard of Hearing (DHH) students. The findings show that teaching pronunciation in this context is quite challenging. Limited input from hearing, differences in hearing ability, and difficulties controlling speech all affect the learning process. The process involves comprehensive instruction in phonetic mastery, and the tactile nature of vocal vibration reflects the teacher's view of the connection between sensory input and communication. The diverse and effective educational framework includes instructional elements, such as repetition and visual support, as well as specific techniques, including oral practice and vocal vibration. These methods foster clarity by being structured around sound pedagogy and classroom engagement, allowing instructors to apply instructional principles, such as individualized adaptation.

Nevertheless, the impact of using vocal vibration techniques can differ depending on the specific

instruction. It can be tricky to track progress for all learners because improvement is subtle and hard to measure accurately. Results may not always have clear patterns or consistent information among students. Therefore, it's important to tailor the method to suit individual needs rather than applying it uniformly to everyone.

Based on the results, teachers need to be flexible in their learning methods. Combining vocal practice with visual support and repetition can help students with different learning needs. Teachers should also consider each student's special strengths and avoid relying entirely on verbal instructional techniques, especially for students with significant hearing impairments. It would be beneficial for future studies to investigate alternative multisensory techniques to enhance pronunciation learning for students with hearing challenges.

REFERENCES

Daftar Pustaka ditulis mengacu kepada standar APA 6th dengan panduan sebagai berikut :

Book :

Creswell, J. W., & Creswell, J. D. (n.d.). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*.

Florian, L., & Pantić, N. (Eds.). (2017). *Teacher Education for the Changing Demographics of Schooling: Issues for Research and Practice. Springer International Publishing*. https://doi.org/10.1007/978-3-319-54389-5.

Knoors, H., & Marschark, M. (n.d.). *Teaching Deaf Learners*.

Monikowski, C. (2004). LANGUAGE, COGNITION, AND THE BRAIN: INSIGHTS FROM SIGN LANGUAGE RESEARCH. *Studies in Second Language Acquisition, 26(3)*, 497–498. https://doi.org/10.1017/S0272263104393058

Journal :

Anggraeni, D., Lubis, D. F., & Wulansari, D. (2023). SPEECH PRODUCTION IN ENGLISH BY STUDENTS WITH HEARING IMPAIRMENT: AN ACOUSTIC PHONETIC APPROACH. *Lire Journal (Journal of Linguistics and Literature)*, 7(1), 56–71. https://doi.org/10.33019/lire.v7i1.182.

Ay, S., & Şen Bartan, Ö. (2022). English language teaching model proposal for Deaf and Hard of Hearing students. *RumeliDE Dil ve Edebiyat Araştırmaları Dergisi*, (26), 1082–1097. https://doi.org/10.29000/rumelide.1076386.

Bedoin, D. (2011). English teachers of deaf and hard-of-hearing students in French schools: Needs, barriers and strategies. *European Journal of Special Needs Education*, 26(2),

159–175. https://doi.org/10.1080/08856257.2011.563605

Chan, M. J. (2018). Embodied Pronunciation Learning: Research and Practice. *The CATESOL Journal*, 30(1). https://doi.org/10.5070/B5.35964

Cieśla, K., Wolak, T., & Amedi, A. (2024). *Resting-state functional connectivity changes following audio-tactile speech training*. Neuroscience. https://doi.org/10.1101/2024.10.26.620393

Fitria, E., & Hardiyantari, O. (2021). *The Impact of Reflective Maternal Method toward Receptive Communication Ability on Student with Hearing Impairment*. 4(1).

Hall, W. C., Levin, L. L., & Anderson, M. L. (2017). *Language deprivation syndrome: A possible neuro developmental disorder with sociocultural origins. Social Psychiatry and Psychiatric Epidemiology*, 52(6), 761–776. https://doi.org/10.1007/s00127-017-1351-7

Halliday, L. F., Tuomainen, O., & Rosen, S. (2017). *Language Development and Impairment in Children With Mild to Moderate Sensorineural Hearing Loss. Journal of Speech, Language, and Hearing Research*, 60(6), 1551–1567. https://doi.org/10.1044/2016_JSLHR-L-16-0297

Heriyanti, Jeane Susan Tapada, Kris Uluelang, Putri Jalila Umasugi, & Isnaeni Wahab. (2023). TEACHER'S STRATEGIES IN TEACHING ENGLISH TO DEAF STUDENTS IN A SPECIAL SCHOOL SORONG. JLE: *Journal of Literate of English Education Study Program*, 4(02), 91–101. https://doi.org/10.47435/jle.v4i02.2332.

Linusi, Y., & Amin, M. (2022). *The Problems and Challenges English Teachers Face in Teaching Students with Disabilities*. 7.

Modern, J. (2025). 'Deaf people are one, as they say': Articulating 'deaf space' and deaf-hearing communication in a Ugandan market. *Language in Society*, 54(4), 869–895. https://doi.org/10.1017/S0047404524000447.

Monsen, R. B. (1976). Normal and reduced phonological space: The production of English vowels by deaf adolescents. *Journal of Phonetics*, 4(3), 189–198. https://doi.org/10.1016/S0095-4470(19)31243-4

Montiegel, K. (2023). 'Use your words': Vocalization and moral order in an oral preschool classroom for deaf or hard-of-hearing children. *Language in Society*, 52(1), 107–127. https://doi.org/10.1017/S0047404521000786

Mv, N., & Gill, C. (2024). A study on the approaches of teaching English for deaf and hard-of-hearing (DHH) students in the special higher secondary schools (HSS) in south India. *Salud, Ciencia y Tecnología*, 4. https://doi.org/10.56294/saludcyt2024.1299

Nover, S. M., Christensen, K. M., & Cheng, L.-R. L. (1998). Development of ASL and English Competence for Learners Who Are Deaf: *Topics in Language Disorders*, 18(4), 61–72. https://doi.org/10.1097/00011363-199808000-00007

Rezvani, R., Ghanbar, H., & Khanshir, Y. P. (n.d.). *Exploring ableism in English language education in DHH university students' lived experiences: A*.

Sharon, A., Yozevitch, R., & Holdengreber, E. (2025). Touch to Speak: Real-Time Tactile Pronunciation Feedback for Individuals with Speech and Hearing Impairments. *Technologies*, 13(8), 345. https://doi.org/10.3390/technologies13080345

Tiwari, H. P. (2024). Challenges in Teaching Pronunciation: Secondary Level English Teachers' Perspectives. *Indonesian Journal of Integrated English Language Teaching*, 10(1), 1. https://doi.org/10.24014/ijielt.v10i1.26092