

Peer Assessment to improve the Pronunciation of Sibilant Sequences in English at the University Level

- (es) Evaluación por Pares para mejorar la Pronunciación de Secuencias Sibilantes en Inglés a nivel universitario
(port) Avaliação por pares para melhorar a pronúncia de sequências sibilantes em inglês no nível universitário

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YUYAY Vol 3. N.2

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Abstract

Phonetics is an important topic in the instruction of future English language teachers; especially when it comes to identifying and correcting pronunciation errors through Peer Assessment. The objective of this research was to identify segmental mispronunciation sequences among Ecuadorian university students. Using Demirezen's Auditory Articulation Model, the research focused on discovering pronunciation errors. The study was designed as action research with a pre-experimental approach, incorporating a pre/post-test, a pronunciation validation sheet and a structured interview. The results reveal a significant improvement in phonetic performance. In addition, word intelligibility was affected by the incorrect production of the sibilant phonemes in English, for which a correction phase was conducted. Finally, the effectiveness of peer assessment in improving the pronunciation and speaking skills of English teachers was reaffirmed.

Keywords: Peer Assessment; Audio Articulation Model; Sibilant phonemes; Pre-service teachers; Intelligibility.

Resumen

La fonética es un tema importante en la instrucción de futuros docentes en idioma inglés; más aún cuando se trata de identificar y corregir errores de pronunciación mediante la evaluación por pares. El objetivo de esta investigación fue la identificación de secuencias de pronunciación segmental errónea entre estudiantes universitarios ecuatorianos en formación pedagógica para ser profesores de inglés. Utilizando el Modelo de Articulación Auditiva de Demirezen, la investigación se centró en descubrir los errores de pronunciación. El estudio se diseñó como investigación-acción con un enfoque pre-experimental, incorporando un pre/post-test, una hoja de validación de la pronunciación y una entrevista estructurada. Los resultados revelan una mejora significativa del rendimiento fonético. Además, la inteligibilidad de las palabras se vio afectada por la incorrecta concretización del fonema sibilante en inglés por lo que se intervino de manera experimental. Finalmente, se constata la eficacia de la evaluación por pares para mejorar la pronunciación y la capacidad de expresión oral de los estudiantes a profesores de inglés.

Palabras clave: Evaluación por Pares; Modelo de Articulación Auditiva; Fonemas Sibilantes; Docentes en Pre-Servicio; Intelligibilidad.

YUYAY Vol 3. N.2

Resumo:

A fonética é um tema importante na formação dos futuros professores de inglês. Ainda mais quando se trata de identificar e corrigir erros de pronúncia através da Avaliação pelos Pares. O objetivo desta investigação foi identificar sequências de erros de pronúncia segmentar entre estudantes universitários equatorianos. Utilizando o Modelo de Articulação Auditiva de Demirezen, a investigação centrou-se na descoberta de erros de pronúncia. O estudo foi concebido como uma investigação-ação com uma abordagem pré-experimental, incorporando um pré/pós-teste, uma ficha de validação da pronúncia e uma entrevista estruturada. Os resultados revelam uma melhoria significativa do desempenho fonético. Além disso, a inteligibilidade das palavras foi afetada pela produção incorrecta dos fonemas sibilantes em inglês, para a qual se interveio numa fase de correção. Por fim, foi reafirmada a eficácia da avaliação entre pares para melhorar as competências de pronúncia e de expressão oral dos professores de inglês.

Palavras-chave: Avaliação pelos Pares; Modelo de Articulação Auditiva; Fonemas Sibilantes; Professores em Formação; Inteligibilidade.

Author's note:

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YUYAY Vol 3. N.2

Introduction

English opens doors and diverse scenarios to new opportunities for study and professional growth. Its correct use leads to assert an effective and eloquent communication for both receptive and productive skills, the latter being a great challenge for most students of English as a foreign language. Therefore, Peer Assessment can be one pedagogical instrument to provide students with a more diverse view of language use and encourage learners to participate in their own learning through collaboration and constructive feedback (Kao, 2023).

The present research is framed in a university context, with future English language teachers who lack certain phonetic segments (English fricative sounds /θ/ and /ð/) in their mother tongue, and who must assimilate them for correct use and future pedagogical instruction (Lizaldes et al., 2022). The focus is to explain how peer assessment helps the assimilation of these phonetic sounds and improve the speaking ability of Ecuadorian pre-service teachers. We base our study on contrastive linguistics (Hill et al., 2014) at the phonetic level to recognize their presence and impact on English language teaching to raise intelligibility and avoid fossilization problems. In this regard, findings indicate that peer assessment impacts metacognitive and self-regulatory processes, especially speech production and pronunciation since it is a reciprocal activity in which students offer feedback to one another to enhance their own learning (Prastika, 2020).

Literature Review

The acquisition of pronunciation is influenced by factors such as learners' backgrounds and aptitude. Teaching approaches include explicit instruction, interactive activities, and the use of technology-based tools. Objective assessment measures, such as acoustic analysis (i.e. the study of physical properties of speech in terms of frequencies, amplitudes and durations) and computer-based assessment, offer more reliable evaluations of learners' segmental pronunciation skills.

Peer assessment has been recognized as an important educational tool, offering numerous benefits such as better learning outcomes, critical skill development, and the creation of a supportive classroom environment (Ndoye, 2017). It has been found to enhance self-regulation, and foster a deeper understanding of subject matter (Falchikov, 2013; Ndoye, 2017; Topping, 2017). By actively engaging in the evaluation of their peers' work, students develop a more comprehensive understanding of assessment criteria and gain valuable insight into their own strengths and weaknesses.

In addition, peer assessment motivates learners to analyze and assess the usage of language and content (Ndoye, 2017). Moncayo et al. (2023) concluded that it contributes to the metacognitive and social skills of students through the interaction of revising and assessing classmates' work. This interaction makes transfer visible. In this process, students showcase their creativity, tolerance, non-linear thinking, and receptivity to other's perspectives. In addition, self-esteem increases since they can openly talk to their peers, express their

opinions and feelings. Liu and Carless (2006) pointed out that it also facilitates the development of communication and collaboration skills to promote learning.

There are factors that influence the acquisition of English segmental pronunciation. Derwing and Munro (2015) reported that learners' first language background, age of exposure to English, and individual aptitude are some factors. Others correspond to differences between the phonetic systems of the first language and English, leading to challenges in accurately producing English sounds (Pennington, 2016). In the regard of phonemes pronunciation, English sibilant phonemes, encompassing sounds such as /s/, /z/, /ʃ/, and /ʒ/, hold some possible constraints on the phonetic accuracy (Chodroff & Wilson, 2022). These phonemes are characterized by a distinctive hissing or buzzing sound and convey meaning and distinguishing words in English speech.

The accurate mastery of sibilant phonemes reflects clear and natural-sounding English pronunciation. One way to acquire them is through the ability to differentiate words with minimal pairs or near-minimal pairs. For instance, the contrast between /s/ and /z/ is necessary for distinguishing words like "sit" and "zit," or "sip" and "zip" (Ladefoged & Johnson, 2015). Similarly, the distinction between /ʃ/ and /ʒ/ distinguishing words such as "ship" and "jip" or "bash" and "badge".

Likewise, sibilant phonemes contribute to the rhythm and flow of English speech, as well as in natural prosody and stress patterns (Roach, 2009). Native-like production of sibilants ensures appropriate timing, emphasis, and cohesion in spoken English, enhancing overall fluency and communicative effectiveness.

Additionally, sibilant phonemes hold social and cultural implications with sonority hierarchy (Kokkelmans, 2021). Native-like pronunciation, including accurate production of sibilant phonemes, can positively impact an individual's perceived competence and credibility in English-speaking contexts (Crystal, 2003). Clear and precise sibilant sounds are associated with speech clarity and are often correlated with professionalism, confidence, and effective communication skills. The improper production or substitution of sibilant phonemes can lead to misunderstandings and hinder overall language proficiency and comprehension. Lastly, these sounds in the Ecuadorian context can be challenging to teach and learn.

Various teaching approaches have been proposed to improve English segmental pronunciation skills. Research highlights the effectiveness of explicit instruction, which involves providing learners with clear explanations of English phonetic features and targeted practice (Kissling, 2013; Levis & LeVelle, 2016). Incorporating interactive and communicative activities, such as role-playing and dialogues, has also shown positive outcomes in enhancing segmental pronunciation (Thomson & Derwing, 2015). Technology-based tools and computer-assisted pronunciation training (CAPT) are increasingly used to support segmental pronunciation instruction. These tools offer learners visual and auditory feedback, allowing for focused practice and self-monitoring of pronunciation accuracy (Revell-Rogerson, 2021). Lastly, Moncayo et al. (2023) highlighted that an intervention using peer assessment demands planning, matching a lesson plan with long-term goals, and including authentic assessment. Besides, assessment must be part of students' work so they are aligned with

objectives and work for expected results. Making students part of the assessment motivates them to be responsible of their learning process.

Accurate assessment of English segmental pronunciation aids students to assess their proficiency and identify areas for improvement. Research indicates that subjective assessments, such as holistic judgments by native speakers, may lack objectivity and reliability (Derwing & Munro, 2015). Consequently, objective measures like acoustic analysis and computer-based assessment are increasingly employed to provide more reliable and precise evaluations of segmental pronunciation (Pennington, 2016).

The concept and benefits in language learning of peer assessment and sibilants phonemes have been summarized. Some approaches of how to teach pronunciation have been included in order to address the pronunciation problem that students may have specially in these phoneme. Knowing that avoiding these sounds can lead to misunderstanding in communication with native speakers.

Methodology

The present study was framed in the context of action-research with a quasi-experimental design. Action research is a methodology that emphasizes problem-solving and the improvement of specific situations within a real-world context. It involves iterative cycles of data collection, analysis, and action, often conducted by practitioners to address practical issues in their professional domains (Creswell & Creswell, 2022).

The action research lasted one month. Students were asked complete pronunciation exercises (speech articulation model) and were trained to peer-assess their classmates' recordings. The exercises provided understanding of the phonetic principles and their practical applications. Throughout the process, students were guided individually and received feedback to refine their pronunciation as well as to improve in their feedback.

In this perspective, two questions framed the methodological structure of the research: First, to what extent can the articulation of English sibilants be improved to maintain the overall intelligibility when using peer assessment? and second, what is the extent of feedback provided by a peer reviewer to improve English articulation effectively?

Description of the participants

The participants were 12 pre-service teachers from a public university of Ecuador. Eight female and four males served as the population ranged between 20 and 24 years of age. All of them belonged to the Pedagogía de los Idiomas Nacionales Extranjeros career and were enrolled in the seventh cycle of their academic training. The students obtained a B1 level in the placement test and were informed about the activities of this action research study and provided their consent.

Intruments

Within this framework of active participation, the development of data collection took place. Firstly, a pre/posttest to know the phonetic and pronunciation characteristics of the participants, before and after the innovation. Secondly, a sound production validation sheet was created specifically by a native English speaker to validate the correct pronunciation considering the four phonetic criteria in reference; and finally, a semi-structured interview was applied to the participants at the end of the innovation.

The pre and posttests were based on the Audio Articulation Model (Demirezen, 2010) in Foreign Language Teacher Education. This allowed the identification of phonetic segments in the mother tongue that are not present in the phonetic repertoire or that have been mistakenly assimilated and thus are fossilized. Participants were recorded at the beginning and at the end. The questions were “Manner of Articulation” with ten sequences of minimal pairs for the position of the phoneme /s/ in initial, middle and final position: 30 sequences in total. The same procedure was followed for the second criterion “Place of Articulation” for the phoneme /z/, third criterion “Stridency” or substitution of the voiceless palato-alveolar fricative [ʃ] by a voiceless palate-alveolar affricate [tʃ] for the phoneme /ʃ/, and the final fourth criterion “Pre-voicing” for the phoneme /ʒ/.

The sound production validation sheet served to avoid bias and subjectivity in the oral results. A native speaker expert in English language teaching carried out this procedure. The validation sheet did not focus on taking into consideration accurate pronunciation of the minimal pairs in each criterion, but on considering the hits of the phonetic segments of each criterion (10 for each segment). Likewise, in order to reduce subjectivity in the results, each participant was asked the same set of questions, order and amount of time to answer. The hits and misses in the oral production of the phonetic segments characterized by appearing at the beginning, in the middle, or at the end of the minimal pairs of the test were classified into correct and incorrect.

The semi-structure interviews were conducted in English and in person. The recordings were made on a computer using Audacity 3.4.2 for Windows with output to MP3 and wav formats. Then, they were transcribed with Otter.AI software. The information was segmented into coding units in order to identify themes, patterns and meanings. Participants were asked ten questions to explore their experience and reflection of the use of peer-assessment to improve their pronunciation.

Results

The results pertained exclusively to the variables of this study and did not represent a general baseline of what constitutes the phonetic properties of the English language. The most important aspect was that the results obtained were pedagogically framed in the following research questions:

Research question 1. To what extent can the articulation of English sibilants be improved to maintain the overall intelligibility when using peer assessment?

YUYAY Vol 3. N.2

The totals resulting from the correct pronunciation of the segments were the sum of the four criteria proposed in this study: place of articulation, manner of articulation, stridency and pre-voicing. The descriptive comparison is not done randomly but in sequential order by participant number, that is, following the same order from 1 to 12. The mean and the range of scores increased significantly from the pretest to the posttest, showing an improvement of the phonetic performance after the innovation (peer assessment application). The standard deviation scores showed a slightly lower variability, which on average, participants' scores varied by an amount around the mean before and after the innovation.

Table 1.
Improvement in pronunciation of sibilants

	N	Mean	SD	Min	Max	p
Pretest	12	61.42	2.73	55	63	0.00
Posttest	12	96.08	2.69	93	101	

The p -value [$P(T \leq t)$] was extremely small (1.08824E-16 for one-tailed and 2.17648E-16 for two-tailed), this indicated that there was significant evidence against the null hypothesis. In other words, the p -value was smaller than any commonly used significance level (such as 0.05). Furthermore, the t -statistic (-77.093) was much lower than the corresponding critical value for both one-tailed (1.795) and two-tailed (2.200). This strengthens the evidence against the null hypothesis which was rejected. All these results showed evidence that the English pronunciation can be improved and intelligibility rates can increase through the application of peer assessment and feedback procedures.

Among the most outstanding results in the application of the rubric after the posttest, a high level of articulation (10 points) was obtained after the innovation. Table 2 indicates an improvement of 4 points on the rating scale, which refers to an enhancement in the status of the participants from the medium to the high level in the speaking ability.

Table 2.
Articulation Level Results

	N	Manner of articulation /S/	Place of Articulation /Z/	Stridency /j/	Pre-voicing /3/	Total
Pretest	12	2	1	2	1	6
Posttest	12	2	2	3	3	10

These general data revealed two essential points to reinforce our initial objectives. First, the position of the English sibilant phoneme (initial, middle, final) affected the intelligibility of the word. Second, the hits for the position categories occurred with unequal probability in the minimal pair exposure; that is, the correct answers regarding the position of the phoneme in the minimal pairs indicate that there is a tendency to better pronounce

YUYAY Vol 3. N.2

the sibilants that are in initial and middle positions. This evidence reaffirmed that the use of a regulatory articulation model provided by peer assessment improved the level of English articulation and upheld the intelligibility in the participants.

Research question 2. What is the extent of feedback provided by a peer reviewer to improve English articulation effectively? Table 3 summarizes the results from the pre and posttest.

Table 3.
Pronunciation criteria accuracies

Hits	Manner of Articulation	Place of Articulation	Stridency	Pre-voicing	Total
Pretest	190	159	204	173	726
Posttest	282	273	305	299	1159

For the criteria: “Manner of Articulation”, “Place of Articulation”, “Stridency” and “Pre-voicing”, the results observed indicate that, thanks to usage of Peer Assessment strategy, pronunciation for the final phoneme position improved by 29.16%, for the initial position improved by 32.5% and the one that showed the best results was the middle position, with an improvement of 33.3% for all sequences.

Moreover, since the p-value was much lower than the 0.05 significance level for all occurrences of the sequences (initial, medium, and final), there was sufficient statistical evidence to state that there was a substantial difference between the pretest and posttest means. The difference suggested that, on average, scores on the posttest were significantly higher than on the pretest for all phoneme sequences. In addition, and interestingly, the correlation coefficient (0.79341) indicated that those who scored higher on the pretest tended to score lower on the posttest, and vice versa.

The qualitative occurrence of the codes indicated that the tendency of improvement of speech after the application of the feedback was considerable (See Table 4). It was though evident that the responses of the semi-structured interview revealed various aspects ranging from linguistic competence to self-motivation, leaving elements of skepticism and confusion to those who participated in the innovation. The recurring category “Manner of articulation” appeared as a focal point in the data, with several repetitions by indicating that this criterion was the reference point on which pre-service teachers have focused the most in indicating that they experienced improvements. Besides, the appearance of “Articulation Model” and “Peer Assessment” as additional occurrences suggested a marked inclination improving speech with the implementation of a feedback instrument based on an articulatory correction model, due to the fact that a better pronunciation is necessary for language teaching professional training.

YUYAY Vol 3. N.2

Table 4.
Semi-Structured Interview Coding

Initial Coding	Categories	Themes	Feedback
Pronunciation	Manner of Articulation	Peer assessment	Positive
Communication	Manner of Articulation	Regulatory Phonetic Model	Significant
Phonetics and phonology	Stridency	Phonetics	Effective
Learning	Place of articulation	Articulation model	Necessary
Pre-Service teachers	Peer-assessment	Phonetic assessment	Improves
English sounds	Manner of articulation	Peer assessment	Improves
Speech	Manner of articulation	Phonetic Model	Helps
Speaking skills	Stridency	Phonetic improvement	Positive
Voicing	Pre-voicing	Language modeling	Effective
Pronunciation	Manner of articulation	Assessment	Positive
Conversations	Manner of articulation	Articulation model	Contributes
Sound patterns	Stridency	Peer phonetic assessment	Very helpful

Difficulty in the pronunciation of segments of the English language as well as the lack of practice in educational situations in the use of these segments were other clear elements highlighted by the participants. Similarly, the data referred to the clear identification of fossilized elements that gave rise to misinterpretations in real contexts.

In sum, the learning and execution of the strategies of the articulatory model revealed identical multidimensional relationships between themes and categories. Furthermore, the emergence of "peer assessment" and "articulatory regulation" brought to light the importance of the application of alternative assessing instruments within the classroom to emphasize the need for a better communication in learning situations.

Discussion

As could be observed in this innovation, pre-service teachers showed pronunciation weaknesses in performing English sibilant phoneme segments that do not exist in Spanish. This is why, through interaction and the application of peer assessment, it has been possible to demonstrate that their productive abilities have improved considerably.

The results obtained in the posttest show a significant improvement of 31.3% for the four criteria included in this study; that is, pre-service teachers' manner of articulation, place of articulation, stridency and pre-voicing commands of the language improved significantly after phonetic instruction, peer assessment and feedback. This was also demonstrated by Kissling (2013) and Levis and Levelle (2016) who stated that the central component of a targeted instruction is usually explicit teaching of L2 phonetics, typically with an emphasis on

the phonetic parameters relevant to segmentals (i.e., isolated consonants and vowels) such as place and manner of articulation.

To provide further clarification of these results, the articulation of English sibilants can be improved (more than 30%) to maintain the intelligibility when using peer assessment and providing feedback. In this sense, peer assessment has proven to be an instrument in the learning stages of a foreign language, as Ndoye (2017) stated that by providing peer feedback, students perform better and the classroom environment becomes supportive. In the same line, Falchikov (2013), Ndoye (2017) and Topping (2017) agreed that peer assessment raise awareness of self-regulation and aids at comprehension of the subject matter.

The overview of the results of the qualitative analysis are projected to show the peer review strategy included in the innovation as efficient and positive. More than 90% of the participants in this study showed empathy and affability when it came to evaluating and providing feedback to their peers. This trend is normal according to a study carried on by Ndoye (2017) because students are motivated to analyze and assess the usage of the language and content. By evaluating the work of their peers, students develop several communication and social skills (Moncayo et al., 2023).

Conclusions

The improvement of speaking skills, pronunciation and especially the phonetic features of a foreign language, are characteristics of a language that can be perfected through the application of formative assessment. Based on the explicit literature of peer assessment, it can be corroborated that with proper planning and systematic teacher preparation, language skills can be improved and thus avoid problems of intelligibility and possible fossilization. It is well understood that although the instruments used in this study do not serve for the teaching practice itself, they contributed to the phonetic awareness and training that, as future English language teachers, should be taken into consideration.

Likewise, the systematic use of rubrics, advanced preparation on peer assessment strategies, and adequate guidance from teaching professionals on assessment and feedback should be applied to professionals in training. Peer assessment increased speaking skills in our study because it is an alternative assessment tool in English language teaching-learning scenarios, due to its versatility of adaptation in different modalities, its method-eclectic functionality, its ability to foster interaction among students, as well as to foster critical thinking and task solving.

Based on our results, the position of the sibilant fricative phonemes in a word affects the intelligibility of the word. For pre-service teachers it is much easier to utter phonetic sequences that do not exist in Spanish, as long as the phonemes are positioned in the middle of an English word. As expected, the use of Peer Assessment shows a favorable tendency to improve the pronunciation of the sibilant fricative phonemes found in middle

position within the criteria of “place of articulation” and “manner of articulation” given the complexity of the phonetic phenomena of "stridency" and "pre-voicing", which are exceptional cases in Spanish.

More accurate sibilant pronunciation results can be obtained by exposing the experimental group to more assimilation and practice time. The AAM Model in alliance with feedback strategies engages a more solid and robust anchor as participants lengthen their training. Undoubtedly, more research related to this phenomenology should be conducted in order to understand its structure, functioning and, above all, to improve the communicative skills and pedagogical competence of future English language teachers in Ecuador.

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