



Student Voice, Mobile Application and Generative Artificial Intelligence Tools for a Study

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Abstract: The voice identifies each person and allows them to relate to others. Mobile applications and AI tools make your study easy. In this case, it is proposed to evaluate the parameters of the voice using a mobile application in students of the subject Phonetic Grammar and Linguistics of the Bachelor of Fonoaudiology of a Faculty of Medical Sciences of the city of Mar del Plata, Argentina, identifying also tools of Artificial Intelligence Generative for their study.

Keywords: Voice Parameters, Generative Artificial Intelligence, Voice Analysis, Mobile App.

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I. Introduction

ICTs have been incorporated into teaching and learning E-learning, then b-learning and then m-learning have been visualized over time.[1] The advance of mobile learning has been enhanced by technological advances reflected in cellular telephony, allowing multiple advantages to be identified.[2] The research carried out in Saudi Arabia not only highlights the possibilities of m-learning, but also considers that its work can help developers of products associated with this modality. [3] Artificial Intelligence has made it possible for information to be processed extremely quickly and has recently had an impact on education, with what are known as “generative models. 4] The word ‘sound’ is more than just ‘noise’. 5] Every sound produced by the vocal tract has a fundamental frequency (F0), which is the number of times the vocal folds vibrate per second. Its determination is of clinical interest as it is a true indicator of vocal health or disease. “In Argentina this value is established for the population of Buenos Aires: Men: mean: 119 Hz, mode: 118 Hz; Women: mean: 207 Hz, mode: 206 Hz” [6] Different options studied by professionals specialized in acoustics have been identified to approach the voice in depth, recognizing the advantages of this knowledge for diagnosis or various

treatments. [7] The objective is to evaluate voice parameters using a mobile application in students of the subject Phonetics, Grammar and Linguistics of the Degree in Speech Therapy of a Faculty of Medical Sciences of the city of Mar del Plata, Argentina, also identifying tools of Generative Artificial Intelligence for its study.

II Development

The experience is developed in two stages. In the first stage, a Mobile Application is used to analyze the speech parameters of 28 students of the subject Phonetics, Grammar and Linguistics of the Degree in Speech Therapy of a Faculty of Medical Sciences in the city of Mar del Plata, Argentina. In the second stage, tools available on the web are analyzed, identifying their main characteristics. In the following graph, the Main Component Analysis was used, considering the variables “Spectrogram”, “Frequency in Herz”, “Average Tone” and “Ambient Volume”. The variables “Voice classification” and “Pitch” were used as supplementary variables. The accumulated inertia rate in the second factorial axis is 76.09%, which means that the perceptual map gathers enough information for the subsequent analysis.

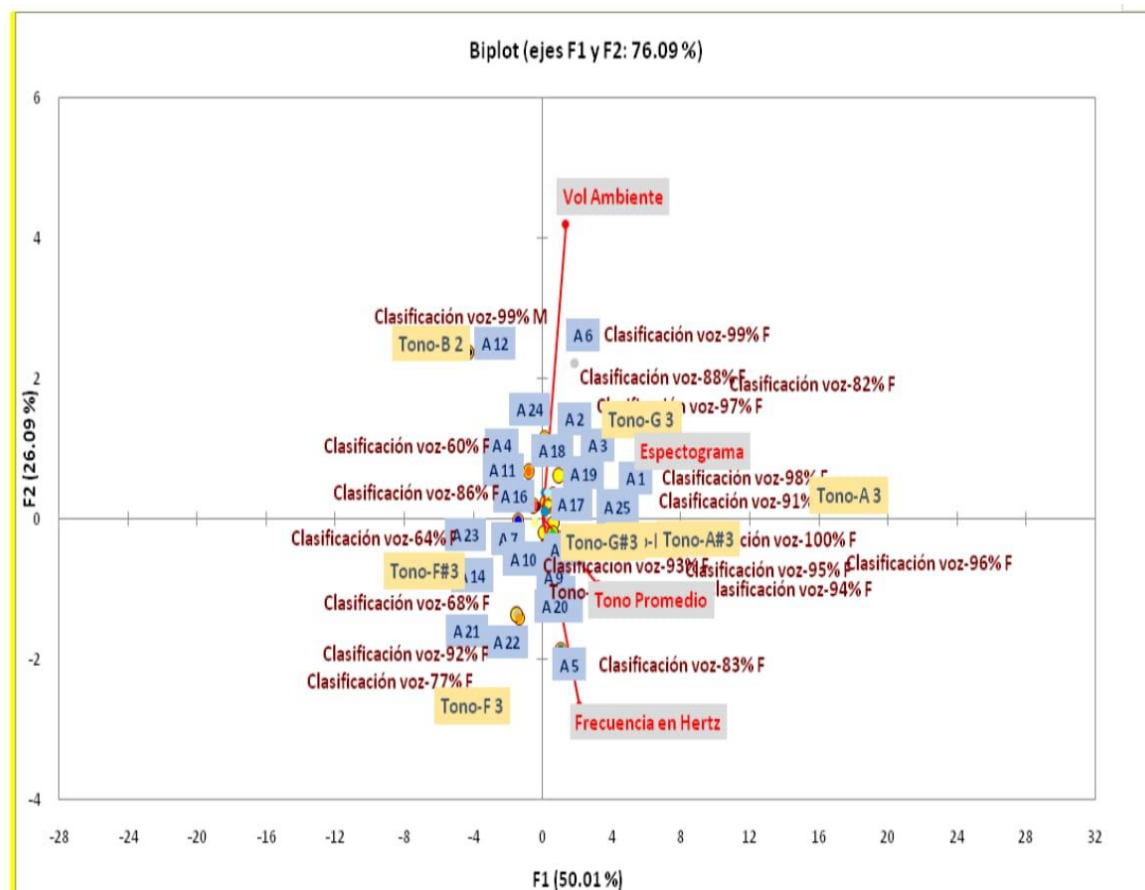


Figure 1: Analysis of Main Components

In the first quadrant we observe those individuals who present higher ambient volume and higher values in the spectrogram, presenting also A 3 and G3 tone. These students have a high voice volume, in order to correct the ambient volume, opening the question of whether this committee has a high voice volume because they are used to “cover” the ambient noise present in today's society. In opposition, in quadrant 3, individuals with lower spectrogram and ambient volume values are observed. Most of the observations in this quadrant are identified with lower percentages in voice classification. It can be inferred that although all the recordings were made in the same space with the same conditions, the ambient noise coming from the outside self-regulates the volume of the vocal emission. In the fourth quadrant are identified those who have higher values in both frequency in Hertz and average pitch and are associated with tones G#3 and A#3. Between the first and fourth quadrant are also those who have the highest percentage of classification in their voice (between 80% and 100%). In the second quadrant, on the other hand, we recognize those with lower average tone and lower Hertz frequency values. In this quadrant the only male observation can be observed. Between the second and third quadrant are those with the lowest percentage of classification in their voice. These data correspond to the analysis detail of the sample whose percentage in the voice emission is mainly female, an aspect that correlates with the sample given that 99% of the population is female. With respect to stage two of the research, 9IAG tools are identified that are associated in different ways to the voice. In the case of the first one, it converts a text from a digital document into a secure format,

and translations are available in 13 different languages. The second tool under study is free of charge. It is suggested for visually impaired people and can be used in 7 languages. The third tool analyzed favors the prediction of certain diseases such as Type 2 diabetes. Relating voice parameters to other patient characteristics with a high percentage of effectiveness. The fourth tool analyzed associates the voice with the conversational to optimize the relationship with clients. The fifth uses a series of selected applications for the voice to improve different “mental and cognitive” aspects, the sixth uses AI to modify voice parameters, the seventh refers to voice biomarkers that help identify health problems, and the last three tools are those that analyze the voice in health centers during telephone consultations, identifying if there are situations of anxiety, for example, and another evaluates the way of pronouncing. In a research carried out on Parkinson's disease, they examine the voice by making a series of recordings and implement Machine Learning as part of a series of strategies to verify or not what has been proposed [8].

III. Conclusions

In Stage 1, students present voice parameters within the normal range in terms of frequency and high voice volume. From Stage 2, it is concluded that the voice can provide extremely valuable information to detect possible diseases. This stage is in continuous progress but generates ethical dilemmas since no exhaustive regulation on these advances in Artificial Intelligence has been identified yet.

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