

KNOWLEDGE ABOUT VOICE AND THE IMPORTANCE OF VOICE AS AN EDUCATIONAL RESOURCE IN THE PERSPECTIVE OF UNIVERSITY PROFESSORS

Conhecimento vocal e a importância da voz como recurso pedagógico na perspectiva de professores universitários

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ABSTRACT

Purpose: to investigate the knowledge about voice and its importance as an educational resource in university professors. **Methods:** the subjects were 112 teachers, mean age 46.60, 35.7% males and 64.3% females, 66.1% Ph.D. The Vocal Production Conditions–Teacher questionnaire was used with adaptations by the researcher proposing new questions of the interest to research and they used an analogic zero to ten scale. Collected a sample of voice teachers and analyzed by speech therapy assessment. Closed questions were analyzed statistically where the mean of self-reported scores were considered in each studied variable. The results were correlated using the variables gender and presence/absence of voice disorder. The answers to open-ended questions were organized according to content similarity and frequency of occurrence. **Results:** there was a significant association in between female sex and high-pitched voice, fatigue and voice loss; voice disorder and weak voice, hoarseness, insufficient voice for work and vocal fatigue. The professors partook in the study in order to cooperate and improve voice in teaching; they would change their voices as far as intensity, tone and modulation; the most frequently used vocal resources in the classroom were tone and intensity variation, modulation and pauses; and when there is a voice disorder, they undergo vocal rest and hydration. The score attributed to voice as an educational resource was 9.42. **Conclusion:** the participants' knowledge about voice was appropriate and it was evaluated as an essential educational resource.

KEYWORDS: Voice; Voice Disorders; Faculty; Voice Quality

■ INTRODUCTION

The voice is a crucial element that enables the work of teachers and the knowledge that this professional has of his voice is extremely important in order to recognize its qualities and limitations, and the consequence of these in class development.

Appropriate vocal functioning favors the effectiveness of communication in the classroom, aids in building teachers' self-esteem and contributes with students' learning skills. Considering that oral

presentations has been the most commonly used strategy in classrooms¹, elevating vocal demand^{2,3}, the voice must be intelligible, accessible, motivational as well as assertive and effective, since the ability to keep student's attention may be harmed if the voice is monotonous, weak or systematically tense and also if the teacher's speech has a deviation in speed or fluency. Thus, the voice in its professional use is highly demanding regarding communication and its good functioning is a basic requirement for the profession⁴.

Teaching requires a high vocal demand that aims to socialize and build knowledge with the students who are many times noisy⁵ and in not always healthy work conditions⁶⁻⁸ that favor concentration^{9,10}, in

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addition to trying to maintain discipline so that the program contents may be met.

Another aspect that should be considered regarding these professionals is the fact that there is a predominance of women in teaching in basically all educational levels, and they should be given specific attention since they have different vocal characteristics from men and are, from a laryngeal standpoint, more vulnerable to voice disorders^{11,12}. Therefore, the knowledge about the differences between voice use in both sexes is of interest to Speech-Language Pathologists.

Although it is not a consensus among studies in the field of Speech-Language Pathology, some investigations have shown that teachers do have knowledge of their own voices^{13,14} and that their harmed vocal qualities, exteriorized as hoarseness and self-perceived throat sensations¹⁵ restrict their communication skills and may harm their teaching and quality of life¹⁶⁻²⁰. Other studies have focused on investigating how the students evaluate the teachers' voices²¹⁻²³ with the purpose of understanding the dialogical relationship that occurs in the classroom.

The way in which the teacher assesses his own voice, the knowledge he has of it and how to deal with it at work as well as his vocal habits have been subjects of interest of many researchers^{4,13,24,25}.

An exploratory and descriptive study was conducted with university professors, with the purpose of investigating these professionals' verbal and non-verbal expressive resources in an experimental situation²⁶. A semi-structured questionnaire was used, and in order to analyze verbal expressivity a recognition test of different facial expressions was used as well as the emission of a sentence with different intonations, in addition to a film footage of the professors talking about a real or imaginary situation representing six emotions. It was seen that the factors that most contributed to a better performance of the teachers' expressivity were pitch and loudness parameters, regarding speech rate, pauses and fluency. It was also found that the type of class ministered and the teacher's communicative strategies used to socialize educational content may interfere in the teaching-learning process of the students.

With the purpose of verifying how students characterize the oral expression of teachers²³, a conducted study was composed of three stages, where the first was the selection of teachers and recording of speech during class, followed by a voice evaluation performed by the students and the completion of a questionnaire about the impressions on each speech sample, and a perceptive-auditory analysis done by four Speech-Language Pathology judges of the aspects related to the vocal

resources used by the teachers. It was found that the teacher who spoke with more pauses in a clear and objective way had her expression evaluated by the students as motivational, firm, pleasant and capable of keeping students' attention. The teacher whose oral expression was considered unpleasant, uninteresting and hesitant, transmitting a feeling of insecurity to the students, used a high pitched voice that was extremely loud. It was concluded that the students valued parameters such as speech rate, pause employment, voice quality and vocal intensity, and that their perception may aid in the preparation of the voices of teachers for education.

In this teaching and learning context, the purpose of this study was to investigate the vocal knowledge and its importance as an educational resource in university professor.

■ METHODS

This is a cross-sectional study that is part of a broader project named "Voice, Job Ability and Quality of Life of University Professors" that was approved by the institutional Ethics Committee for Research with Human Beings in 09/05/2011, under number 0654/11.

The subjects of the study were 112 university professor aged between 24 and 76 years, with a mean of 46.6 years (standard deviation 10.91). Of these, 72 (64.3%) were females and 40 (35.7%) males, 78 (69.6%) of whom were married. As for their level of education, five (4.5%) are specialists, 23 (20.5%) have a Master's Degree, 74 (66.1%) have a Ph.D. and 10 (8.9%) did not answer to this question. In regard to the knowledge field according to the National Research Council (CNPq), 35 (31.3%) were in the Health field, 27 (24.1%) in Human Sciences and Linguistics, Literature and Arts, 23 (20.5%) in Applied Social Sciences, 15 (13.4%) in Exact and Earth Sciences and Engineering, 10 (8.9%) in biological sciences and two (1.8%) did not respond.

The professors were personally contacted and invited to participate in the study by the researchers, during events sponsored by the institution and in the teachers' lounge. At this time the purpose of the study was presented and they were asked whether they would be willing to participate.

The inclusion criteria were: being a professor at the university where the study was conducted, manifesting acceptance to participate by signing the Free Consent Term and providing answers to the instruments used. The teachers who did not meet these criteria were excluded.

The professors filled out the Conditions of Voice Production – Teacher (CPVP)²⁷ questionnaire in a

modified version to which other questions contemplating the purposes of this study were attached. From the questionnaire mentioned above, the following items were used: Identification (date of birth, sex, marital status and education) and Voice (Vocal demands (speaks standing up, speaks sitting down, speaks excessively, speaks while carrying weight, speaks in an open environment, speaks while performing physical activity; and Vocal symptoms (vocal fatigue, dry throat, shortage of breath, sore throat, strained speech, globus sensation, pain when speaking, dry cough, cough with phlegm, phlegm, voice loss, weak voice, low-pitched voice, high-pitched voice).

The following questions were added: Reason(s) for being interested in the study, as it was important to investigate if only the professors with voice disorders would look for the researcher; Self-reported voice evaluation and its use in teaching with the sub-items:

Vocal demands (asks for silence, uses incisive voice (gives order), uses melodious voice, pauses during speech, speaks excessively, speaks in a closed environment, speaks in a room with air conditioning, speaks too fast, speaks too slowly, uses very long sentences, uses a voice that is different from the habitual voice); Vocal characteristics indicated by the teacher (clear, ugly, thin, low, pleasant, annoying, hoarse, strong, weak, sexy, monotonous, flexible, enough for the job, mellow, childish, other – which?, and what grade do you give your voice?). Open questions were added asking the teachers about what they would change in their voices, vocal resources used in the classroom and their attitudes when their voice is not normal.

In addition to the insertion of new questions, an analogic scale from 0 to 10 was proposed to evaluate the dimensions present in the instrument (Figure 1).

I – Identification

Date of birth:

Sex: () female () male

Relationship Status: () single () married or any form of union () separated or divorced () widow

Education: () Specialist () Masters' Student () Master's Degree () Ph.D. Student () Ph.D. () post-Doctorate

Course teaching:

II. Reason(s) for the interest in this study

III – Work Conditions

For how long have you been a teacher?											
How many hours a week do you work?											
Assess your work environment											
0= none 10 = very much											
Noise	0	1	2	3	4	5	6	7	8	9	10
Dust	0	1	2	3	4	5	6	7	8	9	10
Smoke	0	1	2	3	4	5	6	7	8	9	10
Temperature	0	1	2	3	4	5	6	7	8	9	10
Lighting	0	1	2	3	4	5	6	7	8	9	10
Ventilation	0	1	2	3	4	5	6	7	8	9	10
Cleanliness	0	1	2	3	4	5	6	7	8	9	10
Comfort	0	1	2	3	4	5	6	7	8	9	10
Assess your work organization											
0= none 10 = very much											
Autonomy in planning and executing activities	0	1	2	3	4	5	6	7	8	9	10
Relationship with co-workers, boss, etc.	0	1	2	3	4	5	6	7	8	9	10

Material availability	0	1	2	3	4	5	6	7	8	9	10
Quality of material	0	1	2	3	4	5	6	7	8	9	10
Stress	0	1	2	3	4	5	6	7	8	9	10
Calm	0	1	2	3	4	5	6	7	8	9	10
Monotony	0	1	2	3	4	5	6	7	8	9	10
Violence	0	1	2	3	4	5	6	7	8	9	10
Satisfaction in work accomplishment	0	1	2	3	4	5	6	7	8	9	10

IV – Voice

Assess your vocal demands											
0= never 10 = always											
Speaks in noisy environment	0	1	2	3	4	5	6	7	8	9	10
Speaks loudly	0	1	2	3	4	5	6	7	8	9	10
Uses microphone	0	1	2	3	4	5	6	7	8	9	10
Speaks while standing	0	1	2	3	4	5	6	7	8	9	10
Speaks while sitting	0	1	2	3	4	5	6	7	8	9	10
Asks for silence	0	1	2	3	4	5	6	7	8	9	10
Uses incisive voice (orders)	0	1	2	3	4	5	6	7	8	9	10
Uses melodious voice	0	1	2	3	4	5	6	7	8	9	10
Uses pauses during speech	0	1	2	3	4	5	6	7	8	9	10
Speaks excessively	0	1	2	3	4	5	6	7	8	9	10
Speaks while carrying weight	0	1	2	3	4	5	6	7	8	9	10
Speaks in open environment	0	1	2	3	4	5	6	7	8	9	10
Speaks in closed environment	0	1	2	3	4	5	6	7	8	9	10
Speaks while performing physical activity	0	1	2	3	4	5	6	7	8	9	10
Speaks in air-conditioned environment	0	1	2	3	4	5	6	7	8	9	10
Yells	0	1	2	3	4	5	6	7	8	9	10
Speaks very fast	0	1	2	3	4	5	6	7	8	9	10
Speaks very slowly	0	1	2	3	4	5	6	7	8	9	10
Uses very long sentences	0	1	2	3	4	5	6	7	8	9	10
Uses different voice from habitual voice	0	1	2	3	4	5	6	7	8	9	10
Assess your vocal habits											
0= never 10 = always											
Saves voice when not at work	0	1	2	3	4	5	6	7	8	9	10
Drinks water while using voice	0	1	2	3	4	5	6	7	8	9	10
Clears throat	0	1	2	3	4	5	6	7	8	9	10
Yells	0	1	2	3	4	5	6	7	8	9	10
Does voice impressions	0	1	2	3	4	5	6	7	8	9	10
Coughs excessively	0	1	2	3	4	5	6	7	8	9	10
Assess your vocal characteristics											
0= never 10 = always											
Clear	0	1	2	3	4	5	6	7	8	9	10
Ugly	0	1	2	3	4	5	6	7	8	9	10
High-Pitched	0	1	2	3	4	5	6	7	8	9	10
Low-Pitched	0	1	2	3	4	5	6	7	8	9	10
Pleasant	0	1	2	3	4	5	6	7	8	9	10
Annoying	0	1	2	3	4	5	6	7	8	9	10
Hoarse	0	1	2	3	4	5	6	7	8	9	10
Strong	0	1	2	3	4	5	6	7	8	9	10
Weak	0	1	2	3	4	5	6	7	8	9	10
Sexy	0	1	2	3	4	5	6	7	8	9	10
Monotonous	0	1	2	3	4	5	6	7	8	9	10

Flexible	0	1	2	3	4	5	6	7	8	9	10
Sufficient for work	0	1	2	3	4	5	6	7	8	9	10
Mellow	0	1	2	3	4	5	6	7	8	9	10
Childish	0	1	2	3	4	5	6	7	8	9	10
Other. Which one?	0	1	2	3	4	5	6	7	8	9	10
What grade would you give your voice?	0	1	2	3	4	5	6	7	8	9	10
What would you change in it?											
Assess the importance of your voice as an educational resource	0	1	2	3	4	5	6	7	8	9	10
What vocal resources do you use in the classroom?											
Voice Disorder											
<input type="checkbox"/> Never had one <input type="checkbox"/> Have had and underwent treatment <input type="checkbox"/> I have had and have only when I catch cold <input type="checkbox"/> I currently have one											
If you have a voice disorder, how long ago did it begin?	<input type="checkbox"/> 0 to 5 months <input type="checkbox"/> 6 to 11 months <input type="checkbox"/> 1 year or more										
What grade would you give to the seriousness of your voice disorder?	0	1	2	3	4	5	6	7	8	9	10
Assess your vocal symptoms 0= never 10 = always											
Vocal fatigue	0	1	2	3	4	5	6	7	8	9	10
Dry throat	0	1	2	3	4	5	6	7	8	9	10
Lack of air											
Sore throat	0	1	2	3	4	5	6	7	8	9	10
Strained speech	0	1	2	3	4	5	6	7	8	9	10
Globus	0	1	2	3	4	5	6	7	8	9	10
Pain when speaking	0	1	2	3	4	5	6	7	8	9	10
Dry cough	0	1	2	3	4	5	6	7	8	9	10
Cough with secretion	0	1	2	3	4	5	6	7	8	9	10
Phlegm	0	1	2	3	4	5	6	7	8	9	10
Hoarseness	0	1	2	3	4	5	6	7	8	9	10
Voice loss	0	1	2	3	4	5	6	7	8	9	10
High/low-pitch varying voice	0	1	2	3	4	5	6	7	8	9	10
Out of tune voice	0	1	2	3	4	5	6	7	8	9	10
Weak voice	0	1	2	3	4	5	6	7	8	9	10
Low-pitched voice	0	1	2	3	4	5	6	7	8	9	10
High-pitched voice	0	1	2	3	4	5	6	7	8	9	10
Have you ever missed work due to a voice disorder?	<input type="checkbox"/> No <input type="checkbox"/> Yes										
How many days, on average, were you away from work?											
Have you ever received any guidance about vocal health care?	<input type="checkbox"/> No <input type="checkbox"/> Yes										
What do you usually do when your voice is not normal?											
Are there cases of voice disorder in your family?	<input type="checkbox"/> No <input type="checkbox"/> Yes										

Figure 1 – Adapted Conditions of Voice Production – Teacher ol (Ferreira et al, 2007)

Furthermore, a speech sample from each professor was recorded, composed by a counting of numbers from one to 20, months of the year, sustained emission of five vowels and the answer to the question “what do you think of your voice during your work performance?”. This material was recorded at the professors’ workplace, in an appropriate

setting for this purpose. Then, the voices were analyzed according to the presence or absence of voice disorder, using the GRBASI scale²⁸ that is widely used in studies and voice therapy and offers data about the Grade (G) of dysphonia, roughness (R), breathiness (B), asthenicity (A), strain (S) and instability (I). Each variable is classified in a scale of

zero to three where 0=absent, 1=mild, 2=moderate and 3=severe. The voices classified as a zero were considered healthy or adapted, and those with grades one to three were considered a voice disorder.

The data obtained were organized and submitted to socio-demographic characterization of the subjects, descriptive and quantitative analysis of the closed questions and qualitative analysis of the open ones. The voices were analyzed and those with presence or absence of voice disorder were identified according to the criteria of the scale that was used.

Statistical analyses were conducted in order to verify associations between the data of vocal

demand, characteristics and self-reported symptoms and Speech-Language Pathology evaluation.

The data were described according to mean, standard deviation, median, minimum and maximum values for quantitative data, and absolute and relative frequencies for the qualitative values, using the Mann-Whitney test to assess the association between the variables and sex. The adopted level of significance was 0.05%.

■ RESULTS

In the association between vocal demands and variable sex (Table 1) there was no distinction between the groups.

Table 1 – Association between self-reported vocal demands and the variable sex

Vocal Demands	Sex	n	Mean	p
Speaks while standing	M	40	9.08	0.912
	F	72	9.06	
Speaks while sitting	M	40	1.85	0.927
	F	72	2.13	
Asks for silence	M	40	4.70	0.214
	F	72	5.40	
Uses incisive voice	M	40	4.23	0.391
	F	72	4.68	
Uses melodious voice	M	40	3.78	0.828
	F	72	3.96	
Pauses in speech	M	40	5.60	0.587
	F	71	5.32	
Speaks excessively	M	40	8.05	0.546
	F	72	8.25	
Speaks while carrying weight	M	40	1.33	0.301
	F	72	1.89	
Speaks in open environment	M	40	2.68	0.639
	F	72	2.86	
Speaks in closed environment	M	40	8.28	0.522
	F	72	8.79	
Speaks while performing physical activity	M	40	2.18	0.677
	F	72	2.21	
Air-conditioned environment	M	40	3.60	0.509
	F	72	3.35	
Yells	M	40	1.78	0.473
	F	72	2.22	
Speaks too fast	M	40	5.05	0.490
	F	72	4.65	
Speaks too slowly	M	40	2.20	0.599
	F	72	2.15	
Uses very long sentences	M	40	5.20	0.400
	F	71	4.75	
Different voice from habitual voice	M	40	2.73	0.657
	F	72	2.96	

*Mann-Whitney Test – $p \leq 0.05$

Table 2 shows the association between self-reported vocal characteristics and sex. Women had significantly greater means regarding the character-

istic of thin voice and mean of grades attributed to their voices that were significantly lower regarding low and strong voice when compared to men.

Table 2 – Association between self-reported vocal characteristics and the variable sex

Vocal Characteristics	Sex	n	Mean	p
Clear	M	40	7.18	0.696
	F	72	6.78	
Ugly	M	40	2.95	0.988
	F	72	3.14	
High-pitched	M	40	1.80	0.041*
	F	72	3.13	
Low-pitched	M	40	5.63	<0.001*
	F	72	2.57	
Pleasant	M	40	6.13	0.545
	F	72	5.82	
Annoying	M	40	1.98	0.289
	F	72	1.78	
Hoarse	M	40	1.88	0.990
	F	72	2.18	
Strong	M	40	6.48	0.001*
	F	72	4.76	
Weak	M	40	1.75	0.676
	F	72	2.44	
Sexy	M	40	1.90	0.073
	F	72	1.14	
Monotonous	M	40	2.75	0.122
	F	72	2.14	
Flexible	M	40	5.18	0.995
	F	72	5.25	
Sufficient for work	M	40	7.95	0.401
	F	72	7.50	
Mellow	M	40	0.95	0.184
	F	72	1.29	
Childish	M	40	0.33	0.125
	F	72	1.06	
Grade for voice	M	38	7.05	0.997
	F	70	6.86	

*Mann-Whitney Test – $p \leq 0.05$

In the comparison between vocal symptoms and sex, there were significant values among vocal fatigue, voice loss and low voice (Table 3) that distinguished the groups of men and women.

Table 4 shows the associations between vocal demands, characteristics and self-reported symptoms and the perceptive-auditory Speech-Language Pathology assessment.

Table 3 – Association between vocal symptoms and the variable sex

Vocal Symptoms	Sex	n	Mean	p
Vocal fatigue	M	40	3.10	0.024*
	F	72	4.42	
Dry throat	M	40	4.25	0.063
	F	72	5.19	
Lack of air	M	40	1.13	0.555
	F	72	1.53	
Sore throat	M	40	2.20	0.057
	F	72	3.22	
Strained speech	M	40	2.88	0.058
	F	72	4.03	
Globus	M	40	0.70	0.169
	F	72	1.15	
Pain when speaking	M	40	0.60	0.245
	F	72	1.22	
Dry cough	M	40	1.30	0.570
	F	72	1.82	
Cough with secretion	M	40	1.33	0.315
	F	72	1.11	
Phlegm	M	40	1.93	0.293
	F	72	1.75	
Hoarseness	M	40	1.78	0.087
	F	72	3.00	
Voice loss	M	40	0.68	0.040*
	F	72	1.75	
High/low-pitched voice	M	40	0.48	0.095
	F	72	1.38	
Out of tune voice	M	40	0.90	0.082
	F	72	1.88	
Weak voice	M	40	1.13	0.152
	F	72	2.24	
Low-pitched voice	M	40	4.53	< 0.001*
	F	71	1.87	
High-pitched voice	M	40	0.90	0.513
	F	71	1.51	

*Mann-Whitney Test- $p \leq 0.05$

Table 4 – Positive associations between results of the Speech-Language Pathology Assessment and the variables of vocal demands, characteristics and symptoms that were self-reported by the professors

Variable	Voice Disorder	n	Mean	sd	Median	Min.	Max.	p
Vocal Demands								
No values with significant statistical association								
Vocal Characteristics								
Hoarse	No	76	1.51	2.00	1.00	0	9	0.008*
	Yes	36	3.25	3.25	2.00	0	9	
Sufficient for work	No	76	8.11	1,69	8.00	0	10	0.002*
	Yes	36	6.72	2.41	7.50	0	10	
Grade for voice	No	74	7.12	1,46	7.00	0	10	0.026*
	Yes	34	6.50	1.46	7.00	4	9	
Vocal Symptoms								
Vocal fatigue	No	76	3.42	2.93	3.00	0	9	0.007*
	Yes	36	5.06	2.77	5.00	0	10	
Hoarseness	No	76	2.08	2.77	1.00	0	10	0.009*
	Yes	36	3.58	3.17	2.00	0	10	
Weak Voice	No	76	1.33	2.17	0.00	0	8	0.001*
	Yes	36	2.92	2.90	2.00	0	9	

*Mann-Whitney Test- $p \leq 0,05$

The vocal resources used by the professors in the classroom are shown in Table 4, as well as parts of the speeches mentioned by them.

There were several reasons why the professors adhered to the study and 32 (28.6%) declared their intention in cooperating, 17 (15.2%) improving their voices while teaching, six (5.4%) sought knowledge

about voice, four (3.6%) preserving their vocal health, three (2.7%) had interest in the subject, three (2.7%) in order to have a vocal assessment and three (2.7%) because they have or have had a voice disorder. This question was not answered by 44 (39.3%) professors.

Table 5 – Vocal resources used by the professors in the classroom

Vocal Resource	Professor Reports	n	%
Non-verbal resources	“microphone”, “drinking water”, “multimedia kit”, “slides”	29	26
Did not respond		23	20
None	“none”; “nothing”	21	19
Intonation	“I speak firmly and change tone”; “I change intonation”	12	11
Only speech	“I use only speech”; “natural voice”; “my own voice”	8	7
Remains silent/uses pause	“I remain silent”; “I use pauses”;	6	5
Intensity variation	“I speak louder”; “I speak stronger”; “I speak lower”	5	4
I don't know	“I don't know”	1	1
Vocal exercises before/after class	“I exercise before and after class”	1	1
Better enunciation and pauses	“enunciation, pauses, I don't use reserve air”	1	1
Projection	“Projection”	1	1
Pause and intonation variation	“I use pauses and change tones to emphasize”	1	1
Pause and intensity variation	“volume and pause”	1	1
Intensity and tone variation	“Varying intonation, tone and intensity”	1	1
Rhythm and intonation variation	“rhythm changes, pauses, different intonations”.	1	1
Total		112	100

Figure 2 shows the professors' answers regarding the aspects they would change in their voices.

On the question regarding their attitudes when the voice is not normal 55 (49.1%) professors opt for voice rest, 51 (45.5%) for hydration, 11 (9.8%) don't do anything, seven (6.3%) go to the doctor, seven (6.3%) did not answer, six (5.4%) take medicines, six (5.4%) perform vocal exercises, four (3.6%) eat apples, three (2.7%) gargle, three (2.7%) use

propolis spray, two (1.8%) drink tea, two (1.8%) have honey, two (1.8%) take throat drops, one (0.9%) sees a speech-language pathologist, one (0.9%) seeks treatment for gastroesophageal reflux and one (0.9%) eats better.

The grades attributed by the professors to the importance of the voice as a resource in the teaching-learning process are shown in Figure 3.

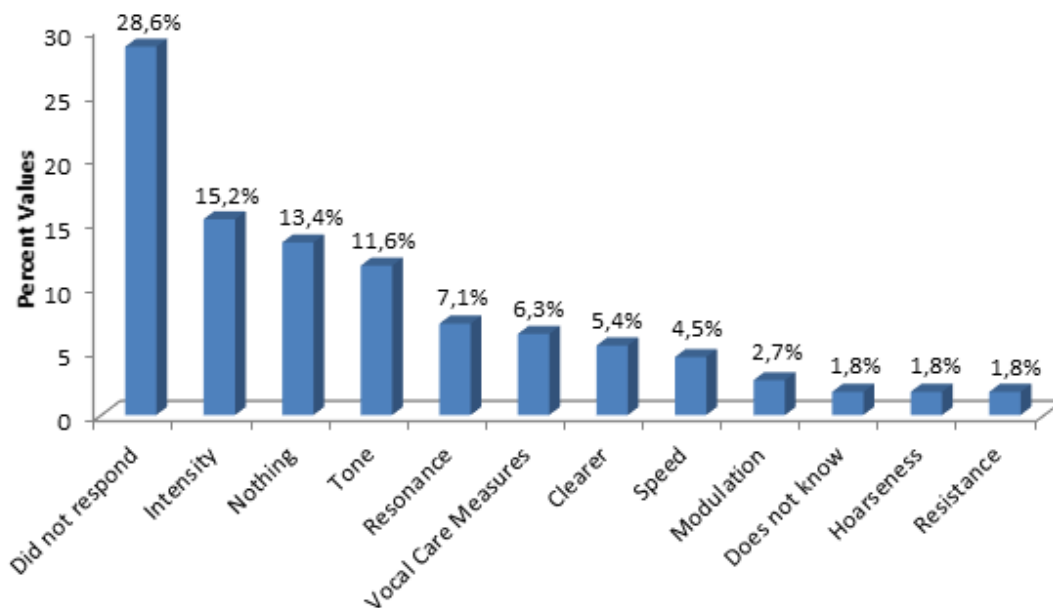


Figure 2 – Percent values concerning the changes reported by the professors regarding their voices

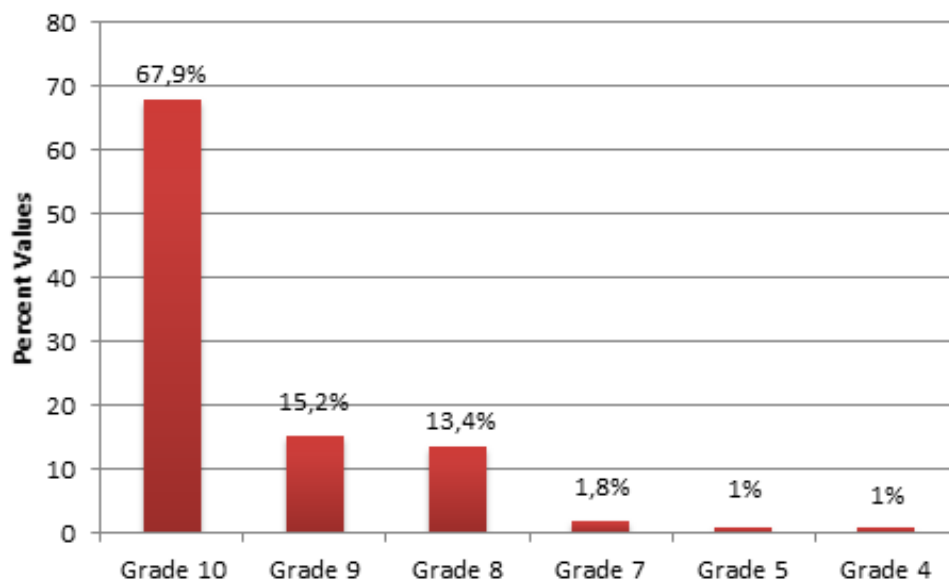


Figure 3 – Values regarding the grade attributed by the professors to the importance of voice as an educational resource

■ DISCUSSION

The results of this study show the several possibilities of analyses of the data offered by the professors and by Speech-Language Pathology Assessment.

The vocal demands most frequently reported by the professors were speaking while standing, speaking excessively and in a closed environment (Table 1), which correspond to the most frequent characteristics found in education, that is, the teacher in a typical classroom, in which he exposes institutional content and, therefore, has a great vocal demand, indicating that the most frequent class dynamics in education, including university education is the verbal exposition^{1,29}. It is known that this kind of educational strategy, albeit consolidated by its efficiency, requires voice usage in a strong intensity, given the number of students and background noise^{4,30-33}.

The association between vocal demands and sex did not prove positive in any of the investigated items, showing that the professors are very similar regarding the research variables and that, each in their own way, uses resources to teach.

It was verified that the professors used higher grades to evaluate their voices as sufficient for their jobs and with a clear quality (Table 2). When relating vocal characteristics to the variable sex, there was an association between thin voice and female sex and low-pitched and strong voice with males. The female larynx, due to its specific architecture and dimensions³⁴, favors the production of a higher pitch than the male larynx, justifying the association found in this study. A strong voice was also correlated to the male sex, possibly because of the specific stature of men that usually proves higher than in women and consequently provide greater pulmonary size and volume, that are directly related to vocal intensity³⁵.

There were associations between the symptoms of vocal fatigue, voice loss and the female sex (Table 3), possibly deriving from the association between the need to speak a lot and lower vital capacity, when compared to men. A study¹⁴ has shown that teachers believe that the ideal voice for their job performance has a low pitch and increased loudness; therefore, in order for women to reach this pattern, they must demand more of their vocal functions, which may cause damages to their voices. The association between low-pitched voice and the male sex may be justified by the physical characteristics that are particular of men, as specified above.

In spite of what has been exposed, this issue deserves to be clarified with the use of research instruments that allow for its qualification from the standpoint of the speech of teachers. Studies

concerning the voice of teachers have found that women have a greater number of voice complaints^{36,37}, possibly due to the fact that they accumulate the workloads regarding teaching and caring for their children and homes⁶.

The professors classified as having a voice disorder in the Speech-Language Pathology assessment were not distinguished from their colleagues with healthy voices regarding voice demands, that is, posture while speaking, type of environment where teaching occurs, type of voice used, need to speak, forms of voice use in speech, among others (Table 4). This finding shows that these factors were not important to the point of causing voice disorders. The deterioration of the voice qualities of teachers are a process and derive from a tightly linked group of elements that are not always pre-established.

The association between voice disorders in the Speech-Language Pathology assessment and self-reported voice characteristics was present for hoarse voice, insufficient voice for work and low grades attributed to one's voice. Hoarseness is one of the most present and most frequently mentioned characteristics in vocal self-assessment^{15,25}, and thus the perception that the voice is below expectations for its performance during teaching is evident, and has the teacher evaluating it negatively^{13,29}, which is in agreement with the Speech-Language Pathology assessment. There was a significant association between self-reported vocal symptoms of fatigue, hoarseness and weak voice and the Speech-Language Pathology evaluation, as the teachers attributed higher grades to these items.

This group of data shows that the professors in the present study are able to identify vocal problems and their symptoms, as well as relating them with the ways in which they may harm their work performance. The knowledge that the teacher has of his own voice has been a controversial issue in studies in the field of Speech-language Pathology, where some studies indicate a lack of perception in this professional category, which would lead to insufficient care and not seeking professional help^{15,24,25}, while others identify a specific vocal knowledge, resulting from the perspective of the professional who uses his voice^{2,13,20}. The data obtained in this study are aligned with these last thoughts.

The reason for the professors' interest in participating in the study shows that they are interested in knowing and perfecting their vocal aspects, as well as in cooperating with the development of studies in this field. Thus, it may be said that there is value attributed to the voice as a work tool³⁸.

When asked about what they would change in their voices, part of the teachers proved to be

satisfied, while others indicated aspects that could be improved such as tone of voice, intensity, modulation, resistance, among others (Figure 2). Likewise, it was found that the vocal resources used by teachers in the classroom include variations in intonation, intensity and rhythm, use of pauses and even vocal exercises performed before and after class (Table 5). Thus, it may be seen that these teachers prove to have vocal knowledge including its use and terms specific to the field of Speech-Language Pathology, as well as vocal strategies that may be employed during teaching, for both its improvement and keeping their students' attention. The use of prosody elements, manipulated by the speaker, increase the quality of the content of speech by showing their assertions and stressing more important issues, which favors the listener's understanding and guarantees a more effective communication³⁹. This knowledge may be a product of Speech-Language Pathology actions disseminated among teachers that qualifies them to preserve their voices, as well as the dissemination of Speech-Language Pathology care by the media and annual voice-awareness campaigns⁴⁰. Thus it is observed that Speech-Language Pathology is a part of the daily life of teachers and that they are aware that the way through which they socialize the instructional content may interfere in the teaching-learning process of students²⁶.

When faced with voice disorders, the professors' attitudes have also proven to be varied, with the predominance of voice rest, hydration and even vocal exercises, in contradiction with the findings of other studies, where the strategies to cope with voice disorders did not go much beyond gargling and household medicines²⁹. Another fact that stands

out is that eating apples was not one of the most mentioned alternatives, which seems to indicate that teachers no longer consider the ingestion of this fruit as responsible for solving any vocal problem. On the other hand, seeking an appointment with a Speech-Language Pathologist had a minimum frequency of answers, possibly due to the fact that teachers minimize their vocal problems or consider their symptoms temporary, not requiring professional help¹⁷⁻¹⁹.

Finally teachers value their voices as a work tool and give it a high grade (Figure 3), which shows that they know that in addition to the educational content being socialized, the way of expressing it through the voice is pivotal to engage the student and favor the teaching-learning process^{14, 22, 26}.

■ CONCLUSION

Professors value the voice as a work tool, have shown appropriate knowledge regarding its characteristics and resources as well as the attitudes to preserve it, showing that the knowledge conveyed by Speech-Language Pathologists is already a part of their daily lives at work.

In regard to the aspects of voice use and the variable sex, an association was found between the identification of voice disorder in the Speech-Language Pathology assessment and self-reported voice characteristics such as hoarse voice, insufficient for work and low grade attributed to voice quality; in addition to vocal symptoms such as fatigue, hoarseness and weak voice. There was no association between vocal demands and voice disorder identified through Speech-Language Pathology assessment.

RESUMO

Objetivo: investigar o conhecimento vocal e sua importância como recurso pedagógico em professores universitários. **Métodos:** participaram 112 docentes, média de 46,60 anos, 35,7% do sexo masculino e 64,3% do feminino, 66,1% doutores. Utilizou-se o questionário Condições de Produção Vocal–Professor, adaptado pela pesquisadora, além da inserção de novas questões abertas e fechadas de interesse para o estudo, as quais foram assinaladas em uma escala analógica de zero a dez. Foram coletadas amostras de voz dos professores e analisadas por avaliação fonoaudiológica. As questões fechadas receberam tratamento estatístico, considerando-se a média das notas autorreferidas, em cada variável pesquisada. Os resultados foram correlacionados a partir das variáveis: sexo e presença/ausência de alteração vocal. Organizaram-se as respostas das questões abertas por similaridade de conteúdo e frequência de ocorrência. **Resultados:** constatou-se associação significativa entre sexo feminino e voz fina, fadiga e perda da voz; presença de distúrbio de voz e autorreferência à voz fraca, rouquidão, voz insuficiente para o trabalho e fadiga vocal. Os professores participaram da pesquisa para colaborar e melhorar a voz na docência; mudariam suas vozes nos aspectos de intensidade, tom e modulação; os recursos vocais mais utilizados em sala de aula foram variação de tom e intensidade, modulação e pausas; e quando a voz está alterada, recorrem ao repouso vocal e à hidratação. Atribuiu-se a média de 9,42 para a voz como recurso pedagógico. **Conclusão:** o conhecimento vocal dos participantes foi apropriado e eles avaliaram a voz como recurso pedagógico essencial.

DESCRIPTORIOS: Voz; Distúrbios da Voz; Docentes; Qualidade da Voz

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