Original Article

https://doi.org/10.1590/2317-6431-2024-2990en

Audiology Communication Research
ISSN 2317-6431

Results of vocal improvement programs for communication students: a comparison of two training approaches

Resultados de programas de aprimoramento vocal para estudantes de comunicação: comparação de duas propostas de treinamento

Maria Cristina de Menezes Borrego[1], *Mara Behlau*[1]

ABSTRACT

Purpose: To compare the results of two vocal training programs for communication students. **Methods:** VP, focused on vocal aspects, and EP, focused on oral expressiveness. 103 students, 46 in VP (16 men and 30 women, mean age of 20.6 years old) and 57 in EP (10 men and 47 women, mean age of 20.2 years old). Small groups were formed with an average of 20 participants per group, randomly distributed between VP and EP. The programs consisted of eight meetings, once a week, and lasted two hours each. The pre- and post-training moments were analyzed to verify the effects of each program and the results obtained post-training in VP and EP were compared. Voice and communicative competence self-assessment protocols, a questionnaire to assess communication engagement and performance in training, and auditory-perceptual judgment of pre- and post-training text readings were applied. **Results:** The students of both groups evaluated better their voice and their communication post-training, no statistical difference between them. EP students considered themselves more involved and with better communication performance, with a statistically significant difference compared to VP. The reading was considered better post-training, with better use of speech rate, pauses, modulation and emphases. **Conclusions:** When comparing two vocal training programs for communication students, there was a difference in self-assessment results in specific questionnaires. Participants in an oral expressiveness program considered themselves more involved and with better communication performance. Pre- and post-training comparison showed positive results in both programs.

Keywords: Voice; Speech; Communication; Voice training; Speech, language and hearing sciences

RESUMO

Objetivo: comparar resultados de dois programas de treinamento vocal para estudantes de comunicação. **Métodos:** elaboraram-se Programa de Desenvolvimento da Voz para Comunicação Oral, visando à melhora da qualidade vocal, e Programa de Desenvolvimento da Expressividade para Comunicação Oral, objetivando ampliar expressividade oral. Participaram 103 estudantes, 46 no Programa Voz (16 homens, 30 mulheres, média de 20,6 anos de idade), 57 no Programa Expressividade (10 homens, 47 mulheres, média de 20,2 anos de idade). Os programas ocorreram em oito encontros de duas horas, semanalmente, em grupos de 20 participantes, em média, distribuídos aleatoriamente. Analisaram-se momentos pré e pós-treinamento e compararam-se resultados entre grupos. Foram aplicados protocolos de Autoavaliação da Voz, Teste de Autoavaliação da Competência na Comunicação, questionário de Autoavaliação de Envolvimento e Rendimento da Comunicação no Treinamento e realizou-se julgamento perceptivo-auditivo de leituras de texto pré e pós-treinamento. **Resultados:** estudantes autoavaliaram melhor voz e competência comunicativa pós-treinamento, nos dois programas, sem diferença estatística entre eles. Estudantes do Programa Expressividade consideraram-se mais envolvidos e com melhor rendimento da comunicação, com diferença estatisticamente significativa em comparação ao Programa Voz. Leituras foram consideradas melhores no pós-treinamento, com uso adequado de velocidade de fala, pausas, modulação e ênfases, nos dois programas, sem diferença estatística entre eles. **Conclusão:** ao comparar dois programas de treinamento vocal para estudantes de comunicação, houve diferença nos resultados de autoavaliação em questionários específicos. Participantes de programa focado em expressividade oral consideraram-se mais envolvidos e com melhor rendimento da comunicação. Comparação pré e pós-treinamento mostrou resultado positivo em ambos os programas.

Palavras-chave: Voz; Fala; Comunicação; Treinamento da voz; Fonoaudiologia

Study carried out at Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brasil.
[1]Centro de Estudos da Voz – CEV – São Paulo (SP), Brasil.
Conflict of interests: No.
Authors' contribution: MCMB was responsible for the study design, data collection and analysis, and manuscript writing; MB was responsible for the study design, data collection and analysis, and final manuscript review.
Funding: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES (33009015).
Corresponding author: Maria Cristina de Menezes Borrego. E-mail: mcristinaborrego@gmail.com
Received: September 22, 2024; **Accepted:** January 07, 2025

INTRODUCTION

Occupational voice users must adjust their vocal quality and communication patterns in their work activities to the demands of their occupation. Many vocal problems resulting from professional voice use occur due to a lack of knowledge of basic vocal hygiene rules or inadequate use of the voice for a specific demand, which can lead to economic and professional losses[1,2]. Knowing the characteristics of oral and body communication in each professional category and their true vocal and expressive demands is essential for developing effective vocal training and oral communication improvement programs aimed at specific audiences[3].

When investigating the particularities of radio and television professionals, terms such as clarity, versatility, controlled use of vocal resources, naturalness, confidence, and credibility are often used to describe their voice and communication profile[1,4-6]. Since their work is quite varied, these professionals' vocal choices must adapt to the demands of their activities by selecting specific voice and speech resources for each function performed. Respiratory coordination and use of pauses according to the logic of the text, well-defined articulation, rich modulation, and adequate use of emphasis are some of the vocal markers desired for good vocal performance by journalists[7-9].

The programs for improving oral communication for occupational voice users found in the literature[1,10-17] generically describe two types of training: one focused on vocal aspects and the other directed at oral expressiveness. However, the exercises indicated for both approaches are, in most cases, very similar and aim to improve vocal quality through voice muscle training for warm-up and vocal preparation, vocal resistance, and flexibility[1,11,16].

However, occupational voice users, especially journalists working in radio and television, need to develop oral expressiveness and make conscious and controlled use of the prosodic aspects of speech to ensure the effectiveness of their message[1,4,7,10,12]. To this end, muscle exercises alone may not be enough for them to understand the message they must convey and to appropriate the text they read and speak. It is important to develop training approaches for text analysis, comprehension skills, and reading aloud in order to increase oral communication expressiveness, enabling better professional performance[10-12].

No studies in the literature have compared the results of training focused on vocal development, based on voice muscle training, with those aimed at developing communication expressiveness, anchored in strategies for analyzing, understanding, and reading texts aloud. Furthermore, non-standardized procedures and the lack of detailed descriptions make it difficult to compare studies and collect more robust data[3,18].

Therefore, this research aimed to compare two vocal training programs for communication students: one group focused on voice muscle training for oral communication, and the other on developing oral communication expressiveness.

METHODS

This research was approved by the Research Ethics Committee of the Federal University of São Paulo – CEP-UNIFESP, under evaluation report number 304.813. All participants signed an informed consent form. The research was developed in two phases.

Phase 1

Developing the training programs

The study developed 8-week programs with a 2-hour meeting per week for each group. In Meeting 1, the participants signed the informed consent form, and the researchers presented the training, applied the assessment protocols, and recorded the participants' voices. Meeting 8 concluded the training with a summary of the program and a review of all the exercises performed. Meetings 2 to 7 were divided into three parts for both groups: Part I – Raising awareness of communication, consisting of dialogued presentation and auditory training; Part II – Vocal warm up and preparation exercises; Part III – Exercises with linked speech, reading sentences, and short texts.

The Voice Development Program for Oral Communication (VP) aimed to improve vocal quality, resistance, and flexibility through vocal muscle training. The researchers developed it based on exercises that interact between the sound source and the vocal tract filter, triggering specific muscle adjustments to improve vocal quality. They selected exercises commonly used in speech-language-hearing (SLH) routine, according to specialized literature[15,16,19,20]. The exercises comprising part II of the VP are listed in Annex 1.

The Expressiveness Development Program for Oral Communication (EP) aimed to enhance oral expressiveness by developing skills in analyzing, understanding, and reading texts. It was developed according to oral expressiveness guidelines in communicative competence, following guidance mapped from professional practice in oral expressiveness, based on the opinion of speech-language pathologists (SLPs) with extensive experience in this area[21]. EP participants were presented with questions associated with oral communication in general, the interaction between interlocutors, vocal psychodynamics, and the relationship between the message form and content. The strategies implemented were mostly linked to text analysis, comprehension, interpretation, and reading[22,23].

The exercises in part II of the EP (Annex 1) aimed to trigger motor adjustments to convey the text's message as desired, according to the interlocutor, and with the different intentions of the speech[10-13].

Instruction of the SLPs who led the groups

The study selected pairs of SLPs working in occupational voice and with self-reported experience in addressing expressiveness. They took turns conducting the VP and EP.

The SLPs underwent a 5-hour training with the following activities: presentation of the research and structure of the training groups, practice of exercises and reading strategies aloud, simulating situations that would be proposed with the training subjects, indication of bibliography, and support material.

The researcher and SLPs maintained weekly contact throughout the process to monitor the groups and answer questions.

Phase 2

Recruiting subjects

Vocal training was promoted through lectures on vocal health and occupational voice use to journalism students, via email, social media, and WhatsApp. Altogether, 193 students signed up to participate. The inclusion criteria were being a Communication and Journalism student, not having undergone previous vocal training, being available to attend at least 75% of the program, and not having self-reported voice problems.

The individuals responded to two protocols: the Voice Handicap Index – VHI-10, validated for Brazilian Portuguese[24], and the Cheek and Buss Shyness Scale[25]. The VHI-10 is a 10-question self-assessment instrument that investigates the impact of a vocal problem. Each question must be answered on a 5-point scale, with 0 being "never" and 4 "always". The total score, calculated by simply adding up the answers, ranges from 0 to 40 points, with 0 indicating no disadvantage, and 40 indicating maximum disadvantage. Individuals with a score above the cutoff value of 7.5 fail the screening[26] and should be referred for a complete vocal assessment. The Cheek and Buss Shyness Scale is a globally used 13-question instrument on communicative behaviors in different routine situations. Each question should be answered on a 5-point scale, ranging from 1 (completely disagree) to 5 (completely agree). The total score is calculated by simply adding up the answers. The individual is considered not shy but may become shy in certain situations when the total score is less than 34 points; a little shy, when the total score is between 34 and 49 points; and very shy, when the total score is greater than 49 points.

The protocol data were evaluated together, as self-reported shyness can influence and be a confounding factor for the perception of voice handicap[27]. Therefore, failing the VHI-10 and being classified as not shy by the Cheek and Buss Shyness Scale were considered exclusion criteria, which led to the elimination of 24 students.

A pilot study provided important information for better adjustment of the program. The data from the 30 participants in this pilot study were not considered in the final evaluation of the research results. During the training, 36 students dropped out or attended less than 75% of the meetings and were also excluded. Thus, at the end of the research, 103 Communication students were evaluated, who were randomly distributed into 46 in VP (16 men and 30 women, with a mean age of 20.6 years) and 57 in EP (10 men and 47 women, with a mean age of 20.2 years). Small groups (G) were formed to implement the program over 1 year, with an average of 20 participants per group, randomly distributed between VP and EP: G1 (n = 19), G2 (n = 24), G3 (n = 20), G4 (n = 25), and G5 (n = 15). The programs had eight 2-hour meetings, held once a week.

Self-assessment and training evaluation protocols

The pre- and post-training moments were analyzed to verify the results of each program, and the post-training VP and EP data were compared to assess whether there was a difference between the programs.

The following questionnaires were developed and applied before and after training to assess vocal quality improvement in PV and oral expressiveness enhancement in PE: Self-Assessment of Training Communication Involvement and Performance, Voice Self-Assessment, Self-Assessment of Communication Competence – SACCom[28], and the auditory-perceptual evaluation of reading texts aloud. The training form and content were also evaluated to verify the participants' impression of the programs.

Self-Assessment of Training Communication Involvement and Performance and form and content evaluation – Students self-assessed their oral communication and involvement with the activities throughout the training, scoring these tasks from 0 to 10. The SLPs who led the groups recorded these scores. In the vocal training evaluation, participants gave a score from 0 to 10 for the way the activity was carried out and its content.

Self-Assessment of voice – Participants were asked, "How do you rate your voice?", marking their answers on a sheet of paper with the scale, 1 = excellent, 2 = very good, 3 = good, 4 = fair, 5 = bad.

SACCom – When the research was conducted, the TACCom had not yet been validated. Therefore, participants answered the original 20-question protocol that investigated different aspects of communication regarding speaking skills (questions 1 to 10) and listening skills (questions 11 to 20): ability to capture and maintain the listener's attention; good and expressive voice; clear speech and good diction; ease in influencing others with communication; ensuring that others remember what was said; ability to speak without being interrupted; ability to take advantage of communication opportunities; having others accept suggestions, criticisms, and feedback; initiative in improving one's own communication; use of communication as personal marketing; ability to not interrupt the interlocutor; ability to pay attention to the verbal and nonverbal message; being responsible for what is said; maintaining the interlocutor's attention; ease in paying attention to the other person without distractions; ability to respond directly to what is asked; showing interest in what is said; confirming important points; ability to memorize important facts and characteristics of the other person; and receiving criticism, praise, and feedback well. In the answer key, the participant must write down one of the alternatives: "yes", "more or less", "no" or "I don't know". To calculate the result, one point should be counted for each answer. A good communicator presents 16 points or more for "yes".

In the final post-training assessment, participants completed the Form and Content Evaluation questionnaire, performed the Self-Assessment of Voice again, and responded to the SACCom.

Auditory-perceptual evaluation of oral communication

The students recorded themselves reading the same informative text at the beginning and end of the training to compare their performance in reading the text aloud in these two moments. The speech samples were recorded directly on the computer using the Fono View program, version 4.4 (CTS Informática). The individuals were seated with the microphone 10 cm away from their mouths. The following equipment was used to record the voices: DELL OPTIPLEX 880 computer, Windows 10 operating system, and Radio Shack microphone. The voices were recorded in wave format, in mono recording, sampling rate of 44,100 Hz and 16 bits. The same recording conditions were maintained for all research participants, at both times of

data collection for each group. All recordings were stored on an external hard drive and later edited in the Audacity program (version 2.1.2) installed on a Dell computer, IntelCore2 Duo CPU processor, and Windows 7 Home Premium operating system.

The auditory-perceptual evaluation was performed by five SLPs specializing in voice, with experience in occupational voice. The voices were presented in a collective session. The judges listened to each participant's readings, organized in a random order, with the pre- and post-training samples randomly sequenced. There was a repetition of 10% of the recordings to test intrarater and interrater reliability. The following recordings were made in an evaluation protocol specially developed for this task:

Comparison of readings and characterization of the best emission – Each judge noted whether the readings were similar or different. If they considered them different, they should choose the best emission, give it a score from 0 to 10, and indicate the reason: voice and speech, interpretation, or both. Then, they should indicate the most evident change, according to the following parameters: clearer voice, considered as vocal clarity; clear diction, referring to the well-defined articulation of speech sounds; credibility of the message, defined as being believable; involvement with the listener, the best-interpreted text reading. Finally, they analyzed the following vocal resources in the readings: frequency, related to the use of low, medium, or high tones; intensity, linked to sound strength or softness; speech rate, referring to the emission produced slowly or quickly; modulation, associated with tonal variation in the text; emphasis, linked to the emphasis given to one or more words during the reading. The responses to this evaluation were noted on the scale: 0 = totally adequate to the text, 1 = partially adequate to the text; and 2 = inadequate.

Statistical analysis

The study used the Statistical Package for the Social Sciences (SPSS, version 13.0), setting the significance level at 5% (α = 0.050) for all analyses.

Cronbach's Alpha Test and Kendall's W Test assessed the reliability of the auditory-perceptual evaluation. Based on this analysis, it was suggested that an evaluator be selected randomly to provide the data for the study analyses.

The data from the self-assessment protocols were compared before and after training and between the two groups of participants (VP and EP). The Wilcoxon Signed Rank Test and Kendall's W Test were applied to verify if there was a difference between the two assessment moments. The Mann-Whitney and Likelihood Ratio tests were applied to check possible differences between VP and EP.

The Mann-Whitney and Likelihood Ratio tests analyzed the auditory-perceptual evaluation data and verified possible differences between VP and EP.

RESULTS

There was no statistically significant difference in vocal self-assessment and communication competence between VP and EP (Table 1). In both groups, the comparison between the two study moments showed that communication students evaluated their voice and communication competence better at the end of the training, according to the data provided by Kendall's W test.

There was no statistically significant difference between the mean reading scores in the voice (VP) and expressiveness (EP) groups. There was a statistically significant difference between the mean reading scores before and after training. The mean post-training score was higher than the mean pre-training score (Table 2).

There was no statistically significant difference between VP and EP in the comparison between readings, reason for choosing the best reading, or characterization of the parameters that indicated the choice of the best reading (Table 3).

Both groups' vocal resources of speech rate, pauses, modulation, and emphasis were appropriate to the text when reading it after training (Table 4).

The comparison between the groups revealed that the EP participants had greater involvement with the training and better communication performance (Table 5). Both groups evaluated the training form and content positively (Table 5).

DISCUSSION

Communication students evaluated their voices and communication competence better after training, in both

Table 1. Self-assessment of voice and communication skills before and after training with the Voice Development Program for Oral Communication and the Expressiveness Development Program for Oral Communication

Self-assessment	Before				p-value	After				p-value
	VP		EP			VP		EP		
	n	%	n	%		n	%	n	%	
Voice										
Excellent	0	0	0	0		1	2.2	2	3.5	
Very good	2	4.3	4	7		23	50	19	33.3	
Good	21	45.7	30	52.6	0.532	17	37	33	57.9	0.156
Fair	20	43.5	22	38.6		5	10.9	3	5.3	
Bad	3	6.5	1	1.8		0	0	0	0	
Communicative competence										
Good	1	2.2	1	1.8	0.878	8	17.4	13	22.8	0.498
Poor	45	97.8	56	98.2		38	82.6	44	77.2	

Significant values ($p \leq 0.050$) – Likelihood Ratio test. p-value per study moment (Kendall W test): Excellent X very good X good X fair X bad: < 0.001; Good X poor: < 0.001*
Subtitle: Before = before training; After = after training; VP = Voice Development Program for Oral Communication; EP = Expressiveness Development Program for Oral Communication; n = number of subjects; % = percentage

Table 2. Mean scores obtained in the auditory-perceptual evaluation of readings before and after training in the Voice Development Program for Oral Communication and the Expressiveness Development Program for Oral Communication

Score	Mean	SD	Minimum	Maximum	p-value
Type of training					
VP	5.67	1.11	3	8	0.219
EP	5.45	1.06	3	8	
Moment					
Before	4.91	0.85	3	7	<0.001*
After	6.18	0.9	4	8	

*Significant values (p ≤ 0.050) - Mann-Whitney test
Subtitle: VP = Voice Development Program for Oral Communication; EP = Expressiveness Development Program for Oral Communication; Before = before training; After = after training; SD = standard deviation

Table 3. Comparison between readings, the reason for choosing the best reading, and characterization of the parameters that indicated the choice of the best reading in the auditory-perceptual evaluation regarding the Voice Development Program for Oral Communication and the Expressiveness Development Program for Oral Communication

Readings	VP		EP		p-value
	n	%	n	%	
Comparison					
Similar	12	26.1	11	19.3	0.411
Different	34	73.9	46	80.7	
After > Before	30	65.2	44	77.2	0.331
After < Before	4	8.7	2	3.5	
Reason					
Voice and speech	14	43.8	20	43.5	
Interpretation	16	50	25	54.3	0.643
Both	2	6.3	1	2.2	
Change					
Clear voice	10	30.3	19	43.2	
Clear diction	5	15.2	2	4.5	0.263
Credibility	0	0	1	2.3	
Involvement	18	54.5	22	50	

*Significant values (p ≤ 0.050) – Likelihood Ratio test
Subtitle: VP = Voice Development Program for Oral Communication; EP = Expressiveness Development Program for Oral Communicatio. n = number of subjects; After > Before = post-training reading better than pre-training reading; After < Before = post-training reading worse than pre-training reading

Table 4. Auditory-perceptual evaluation of vocal resources used before and after training in the Voice Development Program for Oral Communication and the Expressiveness Development Program for Oral Communication

Resources Vocal	VP				EP				p-value
	Adequate		Inadequate		Adequate		Inadequate		
	n	%	n	%	n	%	n	%	
Frequency	89	97.8	2	2.2	113	100	0	0	0.113
Intensity	91	100	0	0	111	100	0	0	>0.999
Rate	85	93.4	6	6.6	98	89.1	12	10.9	0.286
Pauses	78	86.7	12	13.3	94	84.7	17	15.3	0.691
Modulation	47	53.4	41	46.6	63	56.3	49	43.8	0.689
Emphasis	50	55.6	40	44.4	62	54.4	52	45.6	0.868

Significant values (p ≤ 0.050) – Likelihood Ration test. p-value according to the study moments (Likelihood Ratio Test): Adequate X inadequate: Frequency: 0.989; Intensity: > 0.999; Rate: 0.014; Pauses: 0.025*; Modulation: < 0.001*; Emphasis: <0.001*
Subtitle: VP = Voice Development Program for Oral Communication; EP = Expressiveness Development Program for Oral Communication; n = number of subjects; % = percentage

Table 5. Mean scores of the self-assessment of communication involvement and performance throughout the training and the assessment of the training content and form in the Voice Development Program for Oral Communication and the Expressiveness Development Program for Oral Communication

Score	VP				EP				p-value
	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	
Involvement	6.03	1.08	3.6	9.3	7.15	0.91	3	8.8	<0.001*
Communication	7.21	1.33	3.75	10	7.85	0.81	4.75	9.8	0.004*
Content	9.64	0.68	8	10	9.59	0.76	6	10	0.706
Form	9.68	0.66	7	10	9.48	0.92	6	10	0.436

Significant values (p ≤ 0.050) - Mann-Whitney test. p-value according to study parameters (Wilcoxon Signed Rank Test): Involvement X Communication: < 0.001
Subtitle: VP = Voice Development Program for Oral Communication; EP = Expressiveness Development Program for Oral Communication; SD = standard deviation

groups (Table 1). These data confirm the positive results of vocal training programs and reinforce the voice-language-expressiveness unit as an inseparable aspect of improving oral communication[1,7,10-13,29], even when the training focuses on developing the voice for communication.

The participants' readings were evaluated better after training in both groups (Table 2). These data reveal the positive result of vocal training[1,11-13,29]. Regarding the reason for the choice, there was no difference between the parameters "voice and speech" and "interpretation" in VP or EP (Table 3), probably because the two types of training likewise mobilized aspects related to voice, speech, and text interpretation.

Both training programs addressed topics related to voice and communication expressiveness but were explored differently and developed with greater or lesser depth. In addition to the difficulty of dissociating the aspects of voice and expressiveness when working on oral communication[1,10-13,29], the planned inequality between the approaches was seemingly not enough to promote distinct reading and text interpretation performances among the VP and EP participants.

To identify changes between readings, the study chose indicators related to physiological parameters (e.g., clear voice and clear diction) and text interpretation parameters (e.g., credibility and involvement). The indicators "clear voice" and "involvement" had the most notable changes in both groups (Table 3). "Clear voice" occurred very often, showing that the immediate effect of the training is perceived through an overall change in the individual's voice, considered here as clear voice. The "involvement" was defined as text better interpreted, less read. The most fluent and best-interpreted text reading was achieved at the end of eight vocal training sessions, transmitting the feeling of involvement[10-12]. Achieving credibility in the same period seems to be more complex and challenging.

When comparing the readings, differences were expected between the groups regarding speech rate, pauses, modulation, and emphasis, and the appropriate use of prosodic elements in the text could have been identified with greater occurrence in EP. The association of several factors contributed to the similar behavior between the groups (Table 4): student attributes, training duration, strategies chosen for each group, and the unity of voice and expressiveness aspects. When comparing the two training moments, the parameters mentioned above were used appropriately in text reading after training, revealing the positive result of vocal training in both groups[1,11-13,29] (Table 4).

The positive evaluation of the training format and content (Table 5), which could be observed in the high scores given by the participants, reinforced the appropriately selected strategies. The programs were developed based on strategies recommended in the specialized literature, with proven impact on improving voice and oral communication[1,10,11,15,16,19,20]. However, if the self-assessed communication involvement and performance in EP were better than in VP (Table 5), it is necessary to consider that the difference in EP referred to how vocal and expressive resources were developed in the program, using strategies to facilitate overall text comprehension[23] and meaning conveyance[22]. The strategies developed in EP and the way they were presented to the participants seem to have been more interesting and effective for the adequate transmission of ideas, making students more involved. Table 5 also shows that, when comparing the study parameters studied, the average communication performance scores were higher than that of involvement throughout the course. This data may be associated with individual indicators of perception of one's own abilities. As they are students, their professional communication references are still under construction and form yet inconsistent set of comparison parameters. Thus, small changes in oral communication, when highly valued, may be evaluated positively by participants.

When considering radio and television professionals as communicators and opinion makers[4], it is necessary to improve vocal and expressive resources for their effective use in conveying the desired message. More than just seeking strategies that favor the correct way of speaking[1], a vocal training program for radio and television professionals should promote flexible voice use and communication and enhance vocal and expressive possibilities, leading to a more conscious and controlled use of communicative resources. If expressiveness is addressed based on promoting oral communication consistently with the content of the message, SLH therapy would be more comprehensive and effective if it were also focused on developing text comprehension and interpretation skills[10]. Thus, training could transform individuals, and SLPs would help develop critical readers and communicators with the autonomy to be true protagonists in developing communication skills.

Voice and expressiveness approaches, if applied together, can enhance the SLH training results to improve oral communication among communication students. Future research should continue investigating the results of such approaches.

CONCLUSION

The research found positive results from the communication students' training in both groups. There was a difference before and after training in all the measures evaluated. In the comparison between VP and EP, the only difference was the self-assessment of communication involvement and performance, with higher scores in EP.

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Annex 1. Strategies used in the Voice Development Program for Oral Communication and in the Expressiveness Development Program for Oral Communication

Voice Development Program for Oral Communication

Meeting 1: Presenting the training
- Signing the informed consent form; applying evaluation protocols; recording the participants' voices
Meeting 2: Breathing
- Technique of cervical movements and shoulder rotation
- Broad movements of the costodiaphragmatic region during deep inspiration and expiration sequences
- Technique of fricative sounds in sonority transition: sss...->zzz...
- Reading aloud sentences that gradually increase in length
Meeting 3: Vocal warm-up
- Reading an informative text aloud before the vocal warm-up
- Technique of cervical movements and shoulder rotation
- Broad movements of the structures of the costodiaphragmatic region during deep inspiration and expiration sequences
- Technique of vibrant sounds in sustained, modulated emissions and in musical scales
- Yawn-sigh technique
- Glottal firmness technique
- Technique of nasal sounds associated with the masticatory technique
- Reading aloud the same informative text and comparing it with the readings before and after vocal warm-up
- Reading aloud another informative text with brief individual feedback, scoring parameters such as frequency, intensity, speech articulation, and resonance
Meeting 4: Articulating speech sounds
- Reading an informative text aloud before the exercises
- Technique of cervical movements and shoulder rotation associated with the technique of vibrating sounds
- Technique of vibrating sounds in modulated emissions
- Technique of nasal sounds associated with the masticatory technique
- Technique of tongue rotation in the oral vestibule associated with the technique of nasal sounds
- Masticatory technique
- Technique of overarticulation associated with the emission of syllabic sequences
- Reading aloud the same informative text and comparing the readings before and after the exercises with brief individual feedback
Meeting 5: Modulating frequency and intensity
- Technique of cervical movements and shoulder rotation associated with the vibrating sounds technique
- Technique of nasal sounds associated with the masticatory technique
- Basal sound technique
- Blowing and high-pitched sound technique
- Vibrating sounds technique in modulated emissions and in musical scales
- Frequency and intensity modulation technique: reading special phrases to practice different inflections and with words previously marked to exercise emphasis
- Reading aloud two short informative texts with brief individual feedback: a lighter text to be read using high tones and rich modulation; a sober text to be read using lower tones and restricted modulation
Meeting 6: Resonance
- Reading an informative text aloud before the exercises
- Technique of cervical movements and shoulder rotation associated with the technique of vibrating sounds
- Technique of fricative sounds: emission of concatenated voiced fricatives "vzj vzj vzj"
- Yawn-sigh technique
- Technique of nasal sounds associated with the masticatory technique
- Technique of tongue rotation in the oral vestibule associated with the technique of nasal sounds
- Technique of chanted voice associated with articulatory sequences and automatic speech
- Reading aloud the same informative text and comparing the readings before and after the exercises with brief individual feedback
Meeting 7: Comparing oral communication before and after training
- Presenting each participant's videos, organized in pairs, recorded in meetings 2 and 6, considered as pre- and post-training material, respectively
- Analyzing the recordings:
- Feedback given immediately after watching each student's video
- Comments on the points that improved and those that could still be improved
Meeting 8: End of training
- Presenting a summary of the program; reviewing all exercises performed; applying evaluation protocols; recording the participants' voices

Expressiveness Development Program for Oral Communication

Meeting 1: Presenting the training
- Signing the informed consent form; applying evaluation protocols; recording the participants' voices
Meeting 2: Breathing
- Discussion on punctuation and breathing/performing a respiratory pause according to the logic of the text, with an example of a sentence with different meanings, according to the punctuation used
- Technique of cervical movements and shoulder rotation
- Broad movements of the costodiaphragmatic region during deep inspiration and expiration sequences
- Technique of fricative sounds in sonority transition: sss... -> zzz...
- Exercise in marking punctuation, such as commas and periods, in printed texts without graphic symbols. The annotation should be made according to the logic of the text, noting the difference in the duration of the pauses in the case of commas and periods
- Reading texts aloud with brief individual feedback
Meeting 3: Vocal warm-up
- Reading an informative text aloud
- Strategy to guide the participant in the overall text comprehension, through questions to identify the structure of the text and infer the author's intention
- Reading aloud the same text and comparing between readings before and after understanding the text
- Technique of cervical movements and shoulder rotation
- Broad movements of the structures of the costodiaphragmatic region during deep inspiration and expiration sequences
- Technique of vibrating sounds in sustained, modulated emissions and in musical scales
- Yawn-sigh technique
- Glottal firmness technique
- Technique of nasal sounds associated with the masticatory technique
- Reading aloud the same informative text, analyzing the situations:
- first reading, without discussing the text
- second reading, after discussing and understanding the text
- third reading, after understanding the text and warming up
- Comparing the readings with brief individual feedback
- Reading aloud another informative text with brief individual feedback, scoring parameters such as frequency, intensity, speech articulation, and resonance, in addition to their relationship with the content of the text
Meeting 4: Articulating speech sounds
- Reading aloud an informative text
- Questions to guide overall text comprehension: identifying the structure of the text and inferring the author's intention
- Technique of cervical movements and shoulder rotation associated with the technique of vibrating sounds
- Technique of vibrating sounds in modulated emissions
- Technique of nasal sounds associated with the masticatory technique
- Technique of tongue rotation in the oral vestibule associated with the technique of nasal sounds
- Masticatory technique
- Overarticulation technique
- Reading aloud the same informative text and comparing readings before and after exercises, with brief individual feedback
- Reading aloud an advertising text aimed at a young audience; therefore, to be read at a fast speech rate, maintaining articulatory precision. Combining all the skills worked on during this meeting: text comprehension strategies and exercises to ensure well-defined articulation. Brief individual feedback
Meeting 5: Modulating frequency and intensity
- Reading aloud a text in which the same sentence has different meanings, according to the position of the comma
- Technique of cervical movements and shoulder rotation associated with the technique of vibrating sounds
- Technique of nasal sounds associated with the masticatory technique
- Basal sound technique
- Technique of blowing and high-pitched sound
- Technique of vibrating sounds in modulated emissions and in musical scales
- Technique of frequency and intensity modulation: reading special sentences to practice different inflections, with words previously marked for emphasis exercises
- Reading poetry aloud. Understanding how each participant uses vocal resources, according to their personal interpretation of the text and the message they wish to convey. Brief individual feedback.

Expressiveness Development Program for Oral Communication (Continued...)

Meeting 6: Resonance
- Reading an advertising text aloud
- Questions to guide overall text comprehension: identifying the text structure and inferring the author's intention
- Reading an informative text aloud before exercises
- Technique of cervical movements and shoulder rotation associated with the technique of vibrating sounds
- Technique of fricative sounds: emission of concatenated voiced fricatives "vzj vzj vzj"
- Yawn-sigh technique
- Technique of nasal sounds associated with the masticatory technique
- Technique of tongue rotation in the oral vestibule associated with the technique of nasal sounds
- Reading aloud the same advertising text and comparing readings before and after exercises, with brief individual feedback
- Technique of chanted voice associated with articulatory sequences and automatic speech
- Reading aloud an informative text with brief individual feedback. Combining all the skills worked on during this meeting: text comprehension strategies and exercises to ensure balanced resonance and improve vocal projection
Meeting 7: Comparing oral communication before and after training
- Presenting each participant's videos, organized in pairs, recorded in meetings 2 and 6, considered as pre- and post-training material, respectively
- Analyzing the recordings:
- Feedback given immediately after watching each student's video
- Comments on the points that improved and those that could still be improved
Meeting 8: End of training
- Presenting a summary of the program; reviewing all exercises performed; applying evaluation protocols; recording the participants' voices