

Student Number: 2316806

Student Name: Alia El Hage Hasík

Word count: 3659 words

How do tailored vocal warm-ups preserve and improve vocal health, function, and agility: strategies for spoken voice users

Critical Evaluation

Introduction

I am part-time one to one voice teacher and full-time class music teacher. Before starting to work at primary school, I already had some mastered singing vocal technique. However the class teacher's type of occupation requires voice work targeted at specific aspect of voice technique and strategy, including projection and emotional control of verbal response (RCSLT, 2006).

I am lyrical soprano and my voice tends to be light in the chest, which may contraindicate with ideal teacher's voice attributes. Morawska and Niebudek-Bogusz (2017) describe that teacher should possess a resilient voice. Outcome of this research and application of designed theory may prove or refute the ideal prototype of teacher's vocal competencies.

Some symptoms as vocal fatigue, lowered pitch and burning were observed in me and my colleagues. While experiencing these symptoms, I realised that losing our artistic instrument could also lead to depressive disorder. We might deal with mental health issues growing over to the ethical spheres. This all prompted me to explore and design strategies for singers - class teachers.

An understanding of voice function and care is basis for preventing any disorder for people who require the voice use to maintain their income (Casper and Murry, 2005). There is varied division in understanding of who specifically is a spoken voice user. Spoken voice users require tailored training aimed at spoken voice rather than the singing voice. This was confirmed in the study of Barlett and Wilson (2017) when investigating implications of vocal health on occupational voice users - performers. Singers may know how to train their voices, but are not in control of their spoken voice when supplementing their economic situation with "heavy voice load jobs".

“Professional voice users include singers, actors and broadcast personalities, whereas, occupational voice users include teachers, clergy, salespeople, courtroom attorneys, telemarketers, receptionists and others” (University of Michigan Health, no date). Ben-David, Icht (2015) and Hazzlet, Duffy and Moorhead (2010) agree, and define the term “professional voice user” as employee who relies on consistent, vibrant voice as a mean of retail. Timmermans et al. (2002) characterise and classify voice users into these groups: vocal performers (singers), vocal professionals (e.g. radio broadcaster, actor) and non-vocal professionals (e.g. theatre directors) depending on how deep would voice problems interfere their job activities. “The non-vocal professionals can perform their jobs with slight or moderate voice problems; only severe dysphonia endangers adequate job performance.” (Timmermans B. et al., 2002, p. 374). There’s no exact classification system of the term “spoken voice user” yet. It has been used interchangeably (Morawska, Niebudek-Bogusz, 2017).

There is a gap in linking the vocal health application to occupational voice user. This has an economic impact - “The direct health costs caused by dysphonia in the United States are estimated to reach US\$13.5 billion” (Martins et al., 2023, p. 2). Canadian Survey investigating edification of voice problems among teachers in Quebec, conducted by Brisson et al. (2021) shows that 90% of respondents never had vocal health education - neither from academic training or employer. Wide range of studies from Europe, North America and Australia/Oceania (Boltežar & Sereg-Bahar, 2014; Buckley, O'Halloran, & Oates, 2015; Da Costa et al., 2012; Fellman & Simberg, 2017; Leão et al., 2015; Roy et al., 2004; Sanssene et al., 2020; Van Houtte et al., 2011; cited from Brisson et al., 2021) interviewed teachers, football coaches, tour guides, and confirmed a lack of information regarding work-related voice issues. When talking to colleagues at my own workplace, findings were very similar. I initially focused on the group of experienced teachers with pedagogical education. One of them agreed having a few voice sessions at university, others mentioned voice work being part of studies for teaching the subject of music. The youngest female colleague admitted struggling with repeated laryngitis throughout the first year. She revealed to me creating her own strategies of balancing the voice load and insisted on having the training incorporated in preparation for the occupation. As a trained singing teacher, I personally started to feel heavy vocal abuse after 3rd year of the routine combination of teaching music classes in the morning and singing lessons in the afternoon.

Several studies prove that application of vocal programs have positive impact on the prevention of vocal issues and educate teachers to care for the most important tool of their profession. Is there an existing model either in pedagogy curriculum or in law for employers? "The Voice Commission of the Union of European Phoniaticians (UEP) and Pan-European Voice Conferences (PEVOC) set up a study programme concentrating on voice as an occupational safety and health (OS&H) issue" (Velsvik Bele, 2008, p. 53). "In Scotland, concern regarding voice problems among newly qualified teachers was expressed and measures to ensure voice care were to be introduced throughout the school system, through an inter-disciplinary approach (GTC Report no. 45, 2002)" (Velsvik Bele, 2008, p. 54). Under the Occupational Health and Safety (OHS) Act 2004 in Victoria (Australia) the risk of voice fatigue is a shared responsibility between the school department and staff (Department of Education Vic, 2023). It is obvious that vocal health should belong to occupational health and safety risks, however this is still not enough supported. In general, the employer is not forced to follow any specific regulations. Initially, I believed the best application would be via induction of new employees or mandatory promotion of vocal health education in order to maintain employee's qualification and competence at workplace. But since it basically remains a dispute in OHS - due to this current situation, legal implication through educational system might be more effective.

Teachers

This study will intentionally focus on the literature regarding teachers as occupational voice users since it's also the largest group of voice users seen by ear, nose and throat's (ENT's) practices. Due to consistent vocal demands, teachers would definitely benefit from regular voice care in form of tailored warm-ups to avoid fatigue or injury. As I mentioned in the introduction, the focus will then narrow further, specifically to class music teachers. As a musical person, I would like to rescue their musical instrument in the first place.

What goal should the use of voice as a tool have in teaching profession? "Teaching is a goal-oriented and result-oriented activity (Ochoma, p. 141). Voice is an imparting-knowledge tool and maintains pupil's attention and interest (Velsvik Bele, 2008). This all is happening through learner's auditory system. Voice is a professional tool to meet pedagogical goals, therefore it is good for teachers to realise that its use applied in workplace might differ from the use of their day-to-day speaking (Ochoma, 2019). This is a good reason why to take care and develop such a skill. "Voice development and appropriate voice work is a part of a teacher's competence-building and is of great value

for a positive self-understanding and sense of profession” (Ministry of Education, 2004; cited from Velsvik Bele, 2008, p. 44). Its attributes serve specific intention: pitch - attention, volume - adapting to situation, articulation - audibility and clarity (Ochoma, 2019). To summarise, voice as teacher’s occupational instrument is not only important to the daily activities of the profession, but also is a channel of perception for learners.

Class Music Teacher

A classroom music teacher may have to be a voice acrobat. It is an educational standard that music classes must be full of engaging musical activities (e.g. playing instruments, rehearsals for performances) and singing (Morris-Campbell, 2022). “Singing is the basic musical activity in music education” (Lešnik, 2020, p. 47). Students are exercising their vocal musculature system during these lessons. It is essential to lead these lessons confidently, organised, with clear instructions and demonstrate healthy vocal technique (Williams, 2013). Switching between speaking and singing in the context of classroom management and lesson flow is a challenge for breath production. The comparison of voice use between music teachers and other subjects teachers was found in Daugherty’s et al. study (2009), where the math teacher’s phonation was in 15% - 22% less present per measured teaching hour than that of the music teacher (cited from Brunkan, 2018). Might it be crucial for music teachers to not sing or speak in the same time as whole class? No one told me this before, and in addition, we give verbal directions while students are singing/playing and try to speak or sing beyond high levels of background noise (Mattiske et al., 1998 and Schwartz, 2009; cited in Baker and Cohen, 2017). On the other hand, when we strategically intend to not phonate more loudly during the presence of noise in the classroom, we might experience noise exposure. “Typical classroom noise level range from 60 dB(A) to 85 dB(A) and often exceed the teacher’s voice level” (Behar et al., 2004; cited in Nix and Roy, 2018, p. 92). Therefore it is not only the voice, but also auditory system which is endangered and which has to be preserved.

When confronting aural or vocal dysfunction over prolonged period, anxiety, frustration and depression might appear. Music teachers may be especially conscious of related symptoms, as they may also affect their singing voice and “musical ear”. Since voice as a tool of expression is an integral part of communication, this could have consequences on social and family life (Rosen and Sataloff, 2021). In some cases, it feeds their professional dilemma: “Participants who viewed self-as-performer encountered conflict between their

identities as musician and as educator” (Prescesky, p. 3), however, active performers who teach are very valuable in the music education.

Several studies confirmed that the mental health of music teachers might affect their voice function and that, in turn, may affect the mental health. Batista da Costa et al. (2013) were collecting personal and professional data from 44 teachers, and claim that their vocal problems affect their emotional state in a form of stress, anxiety and depression. In a subsequent study the impact of emotional speech on the glottis was analysed and the findings showed steep long-glottis interval pulses for anger (Klasmeyer and Sendlmeier, 2000) and fast-closing impulses for “high arousal” emotions. “Such rapid closing is a sign of increased vocal effort and/or laryngeal muscular tension as in pressed voice” (Klasmeyer, G. & Sendlmeier, W. F. 1997; Fant, G. 1993; cited in Johnstone and Scherer, 1999, no pagination). This analysis was not the most recent and more research on emotional speech and changes in the vocal tract is needed.

The impact of emotional reaction

Can mental health and emotions experienced during the job performance affect the spoken and sung voice function necessary for the occupation? To tailor future strategies, it is important to know all risks. “One cannot help teachers develop their classroom and management skills without also addressing their emotional reactions and responses and the attitudes.” (Nias, 1996, no pagination). Class is an interactional environment and I think consciousness of emotional control is the best feature of a professor. It might easily slip into even voluntary, non-effective responses lead by the atmosphere of the class. Sudden changes of dynamics and pitch, switching between emotions to give feedback to each student, accents to emphasise or gain attention when necessary, plus music teacher has to multitask between singing and instructional speaking (Welch et al., 2010). Prolonged phonation under these circumstances can cause stress, tension or induce anxiety. At the same time, the delicate muscles around the vocal cords are connected to the nervous system, and all of this could reshape proper and healthy speech production (Ludlow, 2005).

Vocal Fatigue and Dysphonia

To support my previous paragraph, I examined the literature surrounding Psychogenic Voice Disorders. Aronson describes their cause as hyper contraction of extrinsic and intrinsic laryngeal muscles, in response to emotional stress. (Sataloff, 2017). We don't know if vocal fatigue has psychological or physical origin (Gotaas and Starr, 2009). In contrast with dysphonia, we cannot even say it is a diagnosis (Kostyk and Rochet, 1998). In this work, I will classify it as a symptom of possible dysphonia or any other pathology, and I will try to treat the symptom with proposed type of exercises. I hypothesise that teachers will most likely suffer from vocal fatigue before experiencing dysphonia, and at this stage I could help as a singing teacher.

Strategy and Warm-ups

"Reduced blood flow to the vocal folds may act as a fatigue-inducing mechanism." (Welham and Maclagan, 2003, p. 24). Vocal warm-ups (WU) can start the adequate blood circulation in whole vocal system. PTP (minimal subglottal pressure needed for vocal cords to oscillate) and PPE (effort spent for phonation) decreased after 20 minutes of warm-ups and increased after 1 hour of loud reading (Milbrath and Solomon (2003). Therefore I would apply a short vocal warm-up (specified further in the strategy section) before starting the voice load.

Hydration

Titze (1984 and 1994; cited in Welhman and Maclagan, 2003) assumed that one of the causes of vocal fatigue is an increased level of viscosity of the vocal cords. It is a consequence of changes of fluid consistency after prolonged vocal use. Solomon and DiMattia (2000) talk about hydration as a good management strategy, and also research by Finkelor, Titze and Durham (1988) and Verdolini-Marston, Titze and Druker (1990) evidenced that state of hydration is essential in the management of vocal fold viscosity.

Strategies to reduce vocal fatigue throughout the teaching day

To start a teaching day, gentle semi-occluded exercises on ascending scale going through the vocal range might be efficient to increase the blood pressure. Lip trills also turn on the resonance activity of each vocal register and it's safe to add or reduce dynamics at the

same time. Theatre coach Linklater (1976) also used them to “free the speaking voice” (Titze, 2006). Glides, sirens are also good combination and it all could be done as a part of a morning routine (pre-recorded ascending piano scales are reachable on several platforms).

Part of the improvement of vocal function and agility is a cool-down followed by tailored voice work. If the music teacher has a symptoms of vocal fatigue and, as previously researched, muscles were exposed to high tension, it is wise to apply other type of semi-occluded exercises on the descending scale. Semi-occluded exercises are both training and voice therapy (Titze, 2006). Straw phonation, blowfish exercise (inspired by work of Sussuma - Feldenkrais Practitioner; cited in Rosenberg and Leborgne, 2021), kazoo finger, slides on fricatives “v” and “f” consonants can “release the press”. Applying the scale in a quick tempo will convince the mind to release any extra tension. Thanks to the swift and gentle vocalising, it won't feel like a voice work after heavy vocal load. I personally struggle with high larynx and “muffled sound” (vocal effect) manipulates the larynx downwards. With these ideas, I'd like to refer to *Modern Vocal Training* as I studied there as a teacher student. If the vocal strain cannot be removed with cool-downs, laryngeal self-massage is an option. There are multiple instructions how to perform self-laryngeal massage. Elongation of vocal tube and elimination of vocal tract shortness followed by the descent of larynx from its high-tension status were observed as benefits of the manual therapy applied on patients with muscle tension issues. Except lowering of the larynx, removal of trigger points is also applied (Rad et al., 2018). Only after any tension release it is capable to be strengthened again.

Relief of vocal fatigue with singing exercises

Tailored technique targeted to specific outcome should be created. “The ability of a muscle to sustain contraction over a prolonged period is in part related to the distribution of motor unit fiber types within the muscle body” (McArdle, Katch FI and Katch VL, 1996; Coper, and Rice, 1990; cited in Welham and Maclagan, 2003, p. 23). Artificial stimulation studies demonstrated high resistance of thyroarytenoid muscles (TA) to the vocal fatigue (Lowell and Story, 2005). Feline and canine material were used for this purpose, whereas the human proportion is much greater. It is worth to focus on exercises that strengthen the TA muscle, especially for female teachers who need to increase voice projection in classes. “The work of speech-language pathologists uses exercises such as the vocal fry (VF),

which originates from the great contractile activity of the intrinsic laryngeal thyroarytenoid muscle (TA)” (Cielo et al., p. 362). Ascending Arpeggio chords in medium slow pace, medium weak dynamics with vocal fry onset are my suggestion for tailored vocal exercise. Application of regular everyday short sessions might balance up the use and result in flow phonation (Gaskill and Erickson, 2007). Last, but not least, “reduced muscle tension accompanies reduced neural activity” (McArdle, 1996; cited in Welhama and MacLagan, 2003, p. 23). Any kind of breath work in evening hours is also not to be underestimated. Of course, there is some amount of intensity of pressure required for the voice production, nevertheless, balance between the subglottal and supraglottal pressure can ease the excessive laryngeal muscle tension (Desjardins and Bonilha, 2020).

Morning [10 minutes]	Forenoon	Afternoon [20 min.]	Evening
Ascending: Lip Trills [Rossini scale] Semi-Occluded exercise Glides Sirens through registers	Drink minimum 1.5l of water between classes. Apply class management strategies.	Cool down and release voice on descending semi-occluded exercises [“v”, “f”]. Add effects if necessary - “muffled” sound to lower the larynx. Apply strengthening fry onset on slow-paced ascending/returning arpeggio chords [e.g.: i, jo]. Self-laryngeal massage *drink between exercises [medium warm herbal tea]	Breathwork: count for 4 while inhaling and count for 4 while exhaling. Prolong if possible.

Discussion

It was discovered that the internal beam of the TA has slow twitch fibers, isotonic, resistant to vocal fatigue (Cielo, 2011). Thyroarytenoid muscle has muscle tissues and fibres made of consistency with better potential of endurance. When practicing the strategy for 2 - 4 weeks, the production of my voice during classes felt more effortless. In the same time, I had better class management and I believe cleared communication towards students. When I postponed this regular voice work, I could still “reap the benefits”, however due to the constant voice use, I literally felt my laryngeal muscles swollen. I gave them laryngeal

self-massage and took one week of a voice break. Despite these first steps, I'm afraid I will have to get back to the routine. It could be an integral part of occupational spoken voice users - music teachers. I want to include speech therapy research and vocal rehabilitation methods into my Personal Development Plan (PDP). To conclude, a tailored strategy for singers - music teachers has been suggested and supported by literature. On the other hand, I can't generalise my ideas since I focused mainly on voices of weaker origin, seeking the vocal fold resistance rather than stronger voices, which might encounter other symptoms during their occupational performance. I can't deny, this could be another expansion of the research in the future so even more types of voices could benefit from customised strategies.

Critical Reflection

The research question represented broad topic and it took me some study time to understand what my narrowed focus will be. I approached this process by "unwrapping" what is the group of people I will be writing about, what health issues they encounter, how they are informed, what tools can I offer as a singing teacher and how (Agee, 2008). There already is a lot of literature towards teachers and their voice problems. It is my workplace, I had a chance to talk to my colleagues - an interview data collection was conducted (Adhabi and Anozie, 2017). The awareness is underrated. We don't preserve our educational instrument and it's not being developed. Literature helped me to argue the level of topic inclusion into workplaces (Phelan and Reynolds, 1996). I would mark this as my first finding - since there are a lot of attempts to protect occupational voices through OSH, legal approaches in educational system might be quicker.

When writing about occupational risks, I felt their impact myself. It wasn't pleasant experience and I started to figure out strategies. I felt anger because I value my musical skills more than pedagogical. My narrow focus from teachers to music teachers was fluent and direct and I did not expect the narrow focus in occupational voice health related issues, neither tailored exercise strategy. My intention was also to incorporate all necessary parts of suggested routine as practically and realistically as possible. As Booth, Colomb and Williams (2003) mention about reasons to write research, I found myself in a situation of the second reason - "writing to understand, discover new connections and complications" (pp. 12,13).

My second finding which I want to develop further in time to come is resistance of thyroarytenoid muscle towards the vocal fatigue. I supported this with literature, but I did not argue (Small, 2011). I already started to apply vocal fry onset exercise on deepening/strengthening and connecting the TA. I feel now that it has been confirmed by research, however I aim to investigate further. I wanted to derive a solution for the vocal fatigue. There is a space for whole voice programme to be designed, however first, I would like to engage myself in voice therapy more. My commitment to action will be proved in Personal Development Plan (see Appendix A).

Rewatching of tutorials and orientating myself in the task requirements was linking/directing my learning outcome. Making the structure of critical evaluation helped me to narrow focus and come to the findings (Boud, Keogh and Walker, 2005). Critical reflection approach helped me to evaluate each article by taking the information and logically deduce solutions. I found beneficial that by learning how to research I can create my own vocal technique applications. Even if these already exist, by comprehension, I can lead my students with greater confidence and detail.

I believe my work contained elements of qualitative and applied research.

My academic writing requires detachment from all “externalities”. I had to take days off work, stay home and focus to research. I also found disturbing to communicate. I had to silence everything. I didn’t even book any tutorial. I wanted to write my work and discuss after. It would be confusing for me to talk about something non-specific. Instructions and tutorials on canvas were to the point.

When skimming articles, I found my thoughts attaching to unimportant finer points. I have to train my brain and sharpen my skimming methods. I also think my readers might find the sentence order confusing. Learning about the process in process and after process puts less weight on me. Reflecting brings me more confidence and motivation towards future practice (Kimberley, 2019). The results explain to me why I took steps towards a concrete path. I did not expect to be researching this topic before I started. After the outcome I realised it is my current vocals situation and if I can help myself I can help others.

Appendix A

Personal Development Plan

1.

Goal: Gain Voice Therapy Overview

Action (when): Rewatch on canvas all videos related to Voice Therapy (Vocal Health section).

Until: June

Outcome: Learning and orientation in the area.

2.

Goal: Training/Continuing Professional Development (CPD)

Action: Courses: *Vocal Health First Aid* and *Healthy Spoken Voice* courses from Vocal Health Education; *Integrating Functional Singing Voice in the Voice Therapy Session* from SpeechtherapyPD.com; *Vocal Massage Training* from Voice Care Centre.

Until: January 2024

Outcome: Gain tools and strategies.

3.

Goal: Learn from Voice Rehabilitation Coach

Action: Talk to relevant people either via VSC or other planned courses. Find what work and steps I can make to be able to practice rehabilitation as a vocal coach.

Until: March 2025

Outcome: Helping my colleagues, offering sessions on voice and recovery.

4.

Goal: Enhance Academic Writing

Action: Rewatch Academic Skills video section on canvas. More reading and writing regularly. Get feedback.

Until: October 2024

Outcome: Writing concisely with better sentence structure connected to the context of a paragraph.

References

- Institut national de la santé et de la recherche médicale RCSLT (2006). The voice and its disorders in teachers. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK7119/> [Accessed 19 March 2024].
- Boltežar L., Bahar M.Š. (2014) 'Voice Disorders in Occupations with Vocal Load in Slovenia', *Slovenian Journal of Public Health*, 53 (4), pp. 304-310.
- University of Michigan Health (U-M Health) *Professional and Occupational Voice Users*. Available at: <https://www.uofmhealth.org/conditions-treatments/ear-nose-throat/professional-and-occupational-voice-users#:~:text=Occupational%20voice%20users%20include%20teachers,part%20of%20what%20they%20do.> (Accessed: 30 December 2023)
- Casper K. J., Murry T. (2000) 'Voice Therapy Methods in Dysphonia', *Otolaryngologic Clinics of North America*, 33 (5), pp. 923-1152.
- Barlett I. and Wilson Pat H. (2017) 'Working 9-5: Casual Relationships Between Singers' "Day Jobs" and Their Performance Work, With Implications for Vocal Health', *Journal of Voice*, 31 (2), pp. 243.e27 - 234.e34.
- Ben-David Boaz M., and Licht M. (2015) 'Voice Changes in Real Speaking Situations During a Day, With and Without Vocal Loading: Assessing Call Center Operators', *Journal of Voice*, 30 (2), pp. 247.e1 - 247.e11.
- Hazlett D.E., Duffy O.M. and Moorhead S.A. (2010) 'Review of the Impact of Voice Training in the Vocal Quality of Professional Voice Users: Implications for Vocal Health and Recommendations for Further Research', *Journal of Voice*, 25 (2), pp. 181 - 191.
- Timmermans et al. (2002), 'Poor Voice Quality in Future Elite Vocal Performers and Professional Voice Users', *Journal of Voice*, 16 (3), pp. 372 - 382.
- Morawska J., Niebudek-Bogusz E., (2017), 'Risk factors and prevalence of voice disorders in different occupational groups - a review of literature', *Otorinolaryngologia*, 16 (3), p. 94.
- Martins G.A. et al. (2023), 'Proposals to promote health and prevent voice disorders in occupational voice users: A scoping review', *Revista CEFAC*, 26 (1), pp. 1 - 11.

Survey Université Laval (2021), *Vocal Health and Vocal Health Knowledge Among Occupational Voice Users in the Province of Quebec*. Surveyed by: Brisson V. et al. (2021).

Velsvik Bele I. (2008), 'The Teacher's Voice: Vocal training in teacher education', *Scandinavian Journal of Educational Research*, 52 (1), pp. 41 - 57.

Department of Education Vic (2023), 'Voice Care for Teachers'. Available at: <https://www2.education.vic.gov.au/pal/voice-care-teachers/policy> (Accessed: 28 March 2024).

Ochoma M. U. (2019), 'Teacher's Voice Quality and Teaching Effectiveness', *AFREVV*, 13 (3), p. 141 - 148.

Morris-Campbell A. (2022), *Developing singing competence, confidence, motivation and self-identity for teaching music in the primary school* [Doctoral dissertation, Queensland University of Technology].

Lešnik I. (2020), 'Teacher's vocal technique as a condition for quality music education', *Journal of Educational & Instructional Studies in the World*, 10 (2), p. 47.

Williams J. (2013), 'Teaching Singing to Children and Young Adults', Compton Publishing Ltd.

Brunkan M. C. (2018), 'Preservice Music Teacher Voice Use, Vocal Health, and Voice Function Before and During Student Teaching', *Journal of Music Teacher Education*, 27 (3), pp. 80 - 93.

Baker V. D. and Cohen N. (2017), 'University Vocal Training and Vocal Health of Music Educators and Music Therapists', *Sage Journals*, 35 (3), pp. 46 - 54.

Nix J. and Roy N. (2018), 'Voice Health and Vocal Education', McPherson G. and Welch G. (ed.) *Vocal, Instrumental, and Ensemble Learning and Teaching*. New York: Oxford University Press, 76 - 94.

Rosen D. C., Sataloff J. B. and Sataloff R. T. (2021), 'Psychology of Voice Disorders', 2nd edn. San Diego, CA: Plural.

Prescesky R. (1997), *A Study of Preservice Music Education Students: Their Struggle to Establish a Professional Identity*, Doctor of Education in Educational Studies, McGill

University, Available at: <https://escholarship.mcgill.ca/concern/theses/2b88qd675>
(Accessed 1 April 2024).

Batista da Costa D. et al. (2013), 'The risk factors and emotional on the voice of teachers with and without vocal complaints', *Revista CEFAC*, 15 (4), pp. 1001 - 1010.

Klasmeyer and Sendlmeier (2000), 'Chapter 15: Voice and Emotional State', Kent R. and Ball M. (ed.), *Voice Quality Measurement*, Singular Thomson, pp. 339-357. Available at: https://www.static.tu.berlin/fileadmin/www/10002019/Ueber_uns/Sendlmeier/2000_SendlmeierKlasmeyer_VoiceEmotionalStates.pdf (Accessed 3 April 2024).

Johnstone and Scherer (1999), 'The Effects of Emotions on Voice Quality', *University of Geneva*, no pagination. Available at: https://www.researchgate.net/profile/Tom-Johnstone/publication/239727245_The_effects_of_emotions_on_voice_quality/links/0a85e52d655578f3dd000000/The-effects-of-emotions-on-voice-quality.pdf (Accessed 3 April 2024)

Nias J. (1996), 'Thinking about feeling: the emotions in teaching', *Cambridge Journal of Education*, 26 (3), [no pagination].

Welch G. et al. (2010), 'Early career challenges in secondary school music teaching', *British Educational Research Journal*, 37 (2), pp. 285-315.

Ludlow Ch. L. (2005), 'Central Nervous system control of the laryngeal muscles in humans', *Respiratory Physiology & Neurobiology*, 147 (2-3), pp. 205-222.

Sataloff R. T. (2017), 'Clinical Assessment of Voice', 2nd end. San Diego, CA: Plural.

Gotaas Ch. and Starr C. D. (2009), 'Vocal Fatigue Among Teachers', *Folia Phoniatica et Logopaedica*, 45 (3), pp. 120-129.

Kostyk B. E. and Rochet A. P. (1998), 'Laryngeal airway resistance in teachers with vocal fatigue: A preliminary study', *Journal of Voice*, 12 (3), pp. 287-299.

Welham N. V. and MacLagan M. A. (2003), 'Vocal Fatigue: Current Knowledge and Future Directions', *Journal of Voice*, 17 (1), pp. 21-30.

Solomon N. P. and DiMattia S. (2000), 'Effects of a Vocally Fatiguing Task and Systemic Hydration on Phonation Threshold Pressure', *Journal of Voice*, 14 (3), pp. 341-362.

Finkelor B.K., Titze I. R. and Durham P. L. (1988), 'The effect of viscosity changes in the vocal folds on the range of oscillation', *Journal of Voice*, 1 (4), pp. 320-325.

Verdolini-Marston K., Titze I. R. and Druker D.G. (1990), 'Changes in phonation threshold pressure with induced conditions of hydration', *Journal of Voice*, 4 (2), pp. 142-151.

Milbrath R. L. and Solomon N. P. (2003), 'Do Vocal Warm-Up Exercises Alleviate Vocal Fatigue?', *Journal of Speech, Language and Hearing Research*, 46, pp. 422-436.

Titze I. R. (2006), Voice Training and Therapy With a Semi-Occluded Vocal Tract: Rationale and Scientific Underpinnings', *Journal of Speech, Language and Hearing Research*, 49 (2), pp. 448-459.

Rosenberg M.D., Leborgne W. D. (2021), 'The Vocal Athlete: Application and Technique for the Hybrid Singer', 2nd edn., San Diego, CA: Plural.

Rad A. R. et. al (2018), 'Efficacy of Manual Circumlaryngeal Therapy in Patients with Muscle Tension Dysphonia', *Shiraz E-Medical Journal*, 19 (7), no pagination.

Lowell S.Y. and Story B. H. (2005), 'Simulated effects of cricothyroid and thyroarytenoid muscle activation on adult-male vocal fold vibration', *The Journal of the Acoustical Society of America*, 120 (1), pp. 386-397.

Cielo C. A. et al. (2011), 'Thyroarytenoid muscle and vocal fry: a literature review', *Revista da Sociedade Brasileira de Fonoaudiologia*. Available at: <https://doi.org/10.1590/S1516-80342011000300020> (Accessed 5 April 2024).

Gaskill Ch. S., Erickson M. L. (2007), 'The Effect of a Voiced Lip Trill on Estimated Glottal Closed Quotient', *Journal of Voice*, 22 (6), pp. 634-643.

Desjardins M. and Bonilha H.S. (2020), 'The Impact of Respiratory Exercises On Voice Outcomes: A Systematic Review of the Literature', *Journal of Voice*, 34 (4), P648.E1-648.E39.

Booth W.C. , Colomb G. G. and Williams J. M. (2003), 'The Craft of Research', 2nd edn. Chicago & London, The University of Chicago Press.

Agee J. (2008), 'Developing qualitative research question: a reflective process', *International Journal of Qualitative Studies*, 22 (4), pp. 431-447.

Adhabi E. and Anozie Ch. B. (2017), 'Literature Review for the Type of Interview in Quantitative Research', *International Journal of Education*, 9 (3), pp. 1-12.

Small M. L. (2011), 'How to Conduct a Mixed Methods Study: recent Trends in a Rapidly Growing Literature', *Annual Review of Sociology*, 37, pp. 57-86.

Phelan P. and Reynolds P. (1996), 'Argument and Evidence', London and New York: Routledge.

Boud D., Keogh R. and Walker D., (2005), 'Reflection: Turning Experience into Learning', London and New York: RoutledgeFalmer.

Kimberley A. (2019), 'Critical Reflective Practice as a means to Encourage Critical Thinking and Strengthen Confidence and self-efficacy of Undergraduate business Students', *Journal of teaching and education*, 9 (1), 243-259.