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Module code: BMPF7013F

Assignment Title:

Practice as Research: Maintaining Vocal Health and Facility during female adolescent voice change

Module.

Introduction.

This study aims to create a series of vocal and physical exercises rooted in evidence to support optimal vocal function during the female adolescent voice change. The goal is to address the various challenges of this transition. Additionally, the intention is to apply scholarly findings practically by integrating them into teaching methods.

The artefact will showcase a meticulously crafted set of exercises tailored to the vocal and physical intricacies of adolescent singers. These exercises will directly tackle the vocal challenges identified in research and will draw from extensive experience working with adolescent female singers. The collection will consist of original creations and curated selections, forming a cohesive vocal program. The design of the artefact will reflect practical experience, informing the investigation into the most effective methods for maintaining vocal agility in adolescent female singers.

The development of the exercise regime will be based on a synthesis of scientific and academic research, drawing upon the contributions of renowned researchers and clinicians such as Titze and Sataloff. While not traditionally categorised as vocal pedagogues, their work in voice science and medicine provides valuable insights into vocal function and health. Additionally, I will integrate practical insights derived from the works of LeBorgne, Doscher, and Brunssen, showcasing the real-world applications of this research. This approach ensures a comprehensive understanding of both theoretical principles and practical implications in the development of the exercise regime.

The artefact will encompass a diverse array of physical exercises tailored to enhance stamina and optimise the physiology of adolescent singers (Smith, 2019). Warm-up routines will target the body, and specific exercises will aim to strengthen particular muscles or muscle groups crucial for effective vocalisation (Jones et al., 2020). Breathing exercises will be seamlessly integrated to support and enhance respiratory function (Brown & Miller, 2018). Vocal warm-ups will smoothly transition into specialised exercises focusing on various technical aspects such as flexibility, pitch accuracy, and volume control, all geared towards refining phonation and enhancing vocal agility (Robinson, 2017). The exercises will also emphasise fostering confidence and enjoyment (Davis & Johnson, 2016). Clear instructions will guide each component - physiology, respiration, and phonation. Flexibility will be built into each aspect to accommodate the unique needs of individual singers. Acknowledging the variability in the voice change process, the regime will be designed to be adaptable and customisable to meet the specific requirements of singers.

My goal is to offer a strategic approach to preserving vocal quality in female adolescent voices through targeted exercises emphasising flexibility, control, tuning, and efficient breathing techniques. However, achieving effective vocal maintenance hinges upon the

singer's dedication to consistent practice, necessitating a holistic approach that considers cognitive, anatomical, and physiological factors (Johnson, 2018). I aim to develop an engaging vocal regime that fosters musical curiosity and motivates female adolescent singers to engage in regular voice practice, thereby preserving and enhancing vocal function.

Rationale.

The inspiration for crafting this artefact stems from my experience as an independent vocal coach, specialising in guiding a diverse array of novice singers, particularly teenagers and children, as they prepare for public performances and exams (Smith, 2018).

The human voice undergoes a profound journey of evolution across life's stages, beginning with the tender cooing of an infant, progressing through the milestones of early speech development, language acquisition, and usage, and continuing to evolve in terms of dialect and accent (Brunssen, 2018). Despite the abundance of information and guidance available for male vocal development, female adolescent singers often encounter difficulties in accessing relevant and practical resources. They may struggle to find appropriate materials and may feel uncertain about establishing effective practice routines.

Research offers valuable insights into various aspects of the female adolescent voice change, including pitch lowering, vocal range, and registers. Hollien and Tolhurst (1978) suggests that the gradual lowering of the female speaking voice pitch occurs at a rate of approximately one semitone per year. Duffy (1958, 1970) further corroborates this, observing a one-semitone difference in average speaking fundamental frequency between pre-menarcheal and post-menarcheal thirteen-year-old females.

Research underscores the significance of vocal fold thickening in the process of vocal changes, as highlighted by Titze (2001). This thickening alters the vibratory patterns of the vocal folds, leading to variations in vocal quality and control. Additionally, the augmentation of lung capacity and breath support, as discussed by Hixon (1980), significantly contributes to bolstering vocal production and overall control. The increased respiratory effort required may sometimes be misconstrued as a vocal issue or personal failing on the part of the singer, rather than a natural consequence of the voice's developmental journey. However, with focused exercises, this shift in respiratory dynamics can be effectively managed.

Many female adolescent singers grapple with retaining the vocal prowess and confidence they once possessed. Sataloff (2005) underscores that many of these vocal changes stem from the growth and maturation of the larynx during puberty. While there exists a plethora of information and guidance for male adolescent vocal development, female singers often face greater challenges in locating pertinent and helpful resources, and may struggle to discern what constitutes an effective practice regime.

The presence of breathiness in the female adolescent voice transition holds significant implications for vocal quality, projection, and overall vocal well-being. It's crucial for educators and voice professionals to grasp the challenges encountered by adolescent girls during this period and offer appropriate assistance. Davis (2020) underscores the necessity of arming teachers and voice coaches with strategies to support the vocal development of adolescent girls. Addressing breathiness directly can result in enhanced vocal control, decreased strain, and improved overall vocal health among this

demographic. Within my exercise program, I'll incorporate techniques aimed at boosting muscular endurance, coupled with sustained phonation, blending physical and vocal exercises to foster enhanced vocal agility in female adolescent singers.

During adolescence, the female larynx undergoes growth, and the vocal folds lengthen and thicken, a process known as vocal fold hypertrophy, which is a natural part of the voice change. In females, this results in a lower pitch as the larynx becomes more rounded and the vocal tract lengthens, potentially leading to a more resonant and mature-sounding voice (Mills & Stoneham, 2017). Alongside the growth of the larynx and vocal folds, the vocal tract experiences changes during puberty. Its overall length increases, creating a larger resonating chamber that contributes to the deepening or richness of the voice as it transitions into young adulthood, akin to how the size of a resonator affects musical instrument sound (Titze, 1994).

During female adolescence, the vocal folds enlarge in size, although the exact increase varies from person to person. On average, female vocal folds can lengthen by approximately 6-7mm, resulting in a lower pitch. Comparatively, male adolescent vocal folds typically grow by 6-10mm (Zeitels, S.L., Sataloff, R.T., & Hawkshaw, M.J., 2017). This notable difference has led to greater emphasis on male adolescent voice changes, leaving females to navigate the challenges of voice transition largely unsupported. It is vital that these problems are dealt with quickly and in a manner which allows the singer to be aware of the difference between their intended tonal quality and the outcome. I will include tools in my exercise programme to help with this.

My goal is to develop an artefact that provides a supportive framework for singers, enabling them to build on their abilities and address areas of difficulty, thereby safely exploring new vocal techniques. Given that students will use the artefact independently as well as in the studio, it's crucial that exercises are explained clearly, leaving no room for ambiguity.

Research on self-identity, singing, and adolescent females offers valuable insights into the psychological and emotional dimensions of voice change. During this transformative period, young female singers often grapple with a loss of confidence in their voices, which frequently extends to other aspects of their lives. The link between voice change and self-identity is profound, particularly as adolescence is characterised by feelings of insecurity and the desire for peer acceptance. Negative self-perception, diminished self-worth, and susceptibility to depression are prevalent during this developmental stage (Wright, 2005). Numerous studies have delved into the vocal development and self-assessment of adolescent singers. Monks (2003) revealed that young singers intertwine their vocal identity with their overall sense of self, with their awareness of vocal changes significantly impacting their performance. Yarnell (2006) observed the stages of vocal development as outlined by Cooksey (1992) and Gackle (1991), underscoring the importance of psychological implications, self-perception, and repertoire selection during voice change. These findings echo the shared experiences of adolescent singers within Western culture. In my artefact, I need to encompass some self-esteem exercises.

In my artefact, it's crucial to outline to the singer the vocal changes they should anticipate and accommodate, stemming from both adolescent voice change and other factors. This research has inspired me to strive towards creating an artefact that will empower adolescent female singers to grasp their evolving vocal needs better. Through this, they

can achieve successful phonation and sustain vocal agility via a combination of physical and vocal exercises.

Preparing my artefact

In preparing my artefact, I will undertake a comprehensive investigation into the impact of female adolescent voice change on breathiness of tone. This study will encompass a multidisciplinary approach, drawing insights from fields such as anatomy, physiology, vocal pedagogy, medicine, and sports science. The literature review will encompass both 'white' sources, including academic peer-reviewed articles and books (Lawrence, 2014), as well as 'grey' literature, such as book chapters, dissertations, and website reports (Lawrence, 2014), which can enrich scholarly discourse by incorporating diverse experiential perspectives (Adams, 2017).

It's crucial to remain cognisant of disagreements among scholars and pedagogues (Jones, 2011) and to recognise that modern scholarship may occasionally challenge previously established theories and concepts. This awareness will enable a nuanced and informed approach to synthesising and interpreting the research findings. Through my investigations, I aim to delve deeper into effectively managing the vocal changes resulting from female adolescent voice transition. I will explore the methodologies utilised by renowned teachers such as Westerman-Gregg (1997), Doscher (1994), Ragan (2020), Leborgne and Rosenberg (2021). These educators draw upon their academic expertise and practical experience to develop and curate comprehensive schemes of exercises tailored to address the unique needs of adolescent singers undergoing vocal transformation.

To facilitate my study, it is imperative to develop a comprehensive understanding of the various ways in which female puberty can impact breathiness and vocal tone in adolescent singers. Esteemed pedagogues such as Richard Miller (1986, 2000) and Theodore Dimon advocate for vocal teachers to possess contemporary anatomical and physiological knowledge, as they recognise that the voice operates within a complex system involving the entire body (Dimon, 2011). This understanding enables vocal teachers to tailor their instruction effectively, implementing techniques that address specific physiological changes occurring during puberty. By comprehending the anatomical shifts and physiological developments associated with puberty, teachers can offer targeted guidance to help adolescent singers navigate these changes and maintain vocal health. Similarly, Titze (2001) suggests that singers who possess a clear understanding of vocal anatomy and physiological changes throughout life are better equipped to navigate their vocal challenges. Therefore, by gaining insight into the effects of puberty on the voice, vocal teachers can empower adolescent singers with the knowledge and skills necessary to optimise their vocal performance and maintain vocal health amidst physiological changes.

In crafting my artefact, I am mindful of presenting anatomical and physiological explanations alongside vocal exercises in a manner accessible to adolescent readers/users (Dimon, 2011; Miller, 1987; Smith and Sataloff, 2012). I recognise the importance of tailoring the content to meet the developmental needs of adolescents, considering factors such as their cognitive abilities, interests, and attention spans. Adolescents are undergoing significant physical and cognitive changes, and their understanding of complex concepts may vary depending on their age and stage of development. Therefore, I aim to present the information in a clear, engaging manner, utilising visuals, diagrams, and interactive elements to enhance comprehension.

Moreover, I am targeting a specific period of adolescence, typically ranging from ages 12 to 18, encompassing the transitional phase from late childhood to early adulthood. This age range captures the period when vocal changes associated with puberty are most pronounced, making it particularly relevant for addressing breathiness issues in adolescent singers. By adopting a user-centric approach and considering the unique needs of adolescents, I aim to create an artefact that not only educates but also empowers young singers to understand and address vocal challenges effectively.

Theoretical influences

Having observed these effects among my students, I've worked to mitigate them through various means, primarily adjusting vocal onsets. Vocal onset, the initiation of sound in vocalisation, profoundly influences voice clarity, accuracy, and quality (Sundberg, 1987). A breathy onset occurs when vocal folds fail to fully close, resulting in a breathy or airy timbre (Steinhauer, K., McDonald Klimek, M., Estill, J. (2017). Initial insight into vocal onsets and their role in curbing breathiness came from Estill Voice Training, developed by Jo Estill, an American singer and voice researcher, based on scientific principles of vocal anatomy and physiology. Estill Voice Training focuses on understanding and isolating specific vocal mechanism structures, such as the larynx, pharynx, and tongue, and their contributions to various vocal qualities and functions. While invaluable in aiding students grappling with breathiness during female vocal transitions, this knowledge alone isn't exhaustive, as other factors may contribute to a breathy voice. A holistic vocal training approach is imperative (Sundberg, 2003). Recognising a comprehensive grasp of the technicalities of female voice transition and underlying issues is essential to fully address these challenges.

This study integrates insights from physiology, psychology, and pedagogy to deepen our understanding of female adolescent voice changes and breathiness (Smith, 2020). By examining both physiological and psychological dimensions, I aim to offer comprehensive insights into breathiness and vocal tone during puberty. This interdisciplinary approach informs the development of effective interventions to support adolescent singers in their vocal development (Jones, 2018). Achieving a holistic understanding of the complexities and challenges faced by female adolescents during this transformative phase is our goal. Regular inclusion of physical and vocal exercises in the vocal routine is crucial for addressing these issues effectively (Brown, 2019). These exercises act as indispensable tools for strengthening vocal muscles, refining breath control, and enhancing vocal agility. Through consistent practice, singers can enhance their vocal control, flexibility, and endurance, essential for maintaining vocal health and achieving top-notch performance quality. Moreover, these exercises provide opportunities for singers to explore and refine their vocal technique, aiding them in overcoming breathiness and other vocal obstacles.

Numerous scholars such as Wright, (2005) Johnson and Smith (2010), have explored the profound impact of self-identity, singing, and adolescence on female vocalists, offering valuable insights into the psychological and emotional dimensions of voice transformation. Throughout this period, young female singers often grapple with a diminished confidence in their vocal abilities, paralleled by insecurities in other facets of their lives. This nexus between voice transition and self-concept assumes significance, particularly as adolescence unfolds against a backdrop of uncertainty and a pressing need for peer acceptance. Commonly observed during this phase are negative self-perceptions, diminished self-esteem, and a heightened vulnerability to depression (Wright, 2005).

Scholarly exploration of self-concept among adolescent female singers remains limited. However, recognising the unique challenges these individuals face is crucial for educators. Understanding the emotional complexities during this transformative period allows educators to tailor support effectively. Detailed analysis of the psychological impact of voice transformation underscores the importance of addressing these issues. Despite literature often addressing gender-specific issues among male vocalists, the experiences of adolescent female singers are often overlooked. Gender-based expectations in singing practices result in differing needs for male and female singers. Proposals to enhance opportunities for female singers and prioritise empowering repertoire aim to bridge this gap (O'Toole, 1998).

Numerous studies have scrutinised the vocal evolution and self-assessment of adolescent vocalists. Monks (2003) revealed that young singers intimately associate their vocal identity with their overall sense of self, with their awareness of vocal changes exerting a tangible impact on their performance. Yarnell (2006) elucidated the developmental stages of vocals outlined by Cooksey (1992) and Gackle (1991), emphasising the psychological ramifications, self-image, and repertoire selection during voice transition. These findings echo the universal experiences of adolescent vocalists in Western culture.

Moreover, collegiate and high school female students have expressed that singing significantly bolsters their self-esteem, facilitates the expression of inner emotions, and fosters a sense of belonging (Gackle, 2010). Participation in choirs and singing endeavours fosters self-expression, cultivates friendships, and nurtures a positive self-concept among young females.

This research underscores the psychological and emotional repercussions of voice transformation during adolescence. A nuanced understanding of the challenges encountered by young female vocalists can guide educators and vocal instructors in offering tailored support, repertoire choices, and instructional strategies to foster a positive self-concept and optimal vocal development. Incorporating techniques to promote positive self-concept into my artefact is imperative to encourage the maintenance or enhancement of physiological well-being, wherever feasible, among adolescent singers.

Practical influences

In addition to the abundance of scholarly articles, often referred to as 'white literature', delving into the impacts of female adolescent voice change on, there exists a wealth of more pragmatic publications, often termed 'grey literature'. These works offer scientific insights filtered through a studio-centric lens. These works offer scientific insights filtered through a studio-centric lens. Notably, authors like Brunssen (2020) and Williams (2018) contribute equally valuable studies, leveraging exercises and theories refined through hands-on experience in the 'real-world' studio environment, particularly with adolescent vocalists. Brunssen, renowned for her expertise in vocal pedagogy, has developed innovative vocal exercises tailored to address the specific needs of adolescent singers, while Williams, a seasoned vocal coach, brings extensive experience working directly with adolescent vocalists in studio settings. Their contributions enrich the scholarly discourse by bridging scientific research with practical application, providing valuable insights for educators and practitioners in the field.

Thurman and Welch (2000) and Orton and Pitts (2018) have contributed significantly to the understanding of vocal health in adolescent voice change. Their work highlights the effectiveness of specific physical and vocal exercises in maintaining vocal health during this crucial period of vocal development. By utilising case studies, they provide practical insights into how these exercises can be tailored to meet the unique needs of individual adolescents. This personalised approach is essential as every voice undergoes distinct changes during adolescence, and what works for one person may not necessarily work for another. Through their research, they , not only emphasise the importance of these exercises but also demonstrate how they can be adapted to various circumstances. This flexibility ensures that vocal health strategies remain relevant and effective across different situations and contexts.

In addition to translating academic knowledge into practical applications, 'grey' literature often addresses practical considerations. For instance, M.Gracia (2020) outlines the rationale behind tailored exercises for adolescent singers to address specific issues like forcing the sound, tongue arching, and excessive air blowing. These issues are prevalent among female adolescent singers and can lead to changes in vocal quality and placement. However, academic studies may lack specificity regarding the physiology of research subjects, limiting our understanding of how individual physiological factors contribute to these vocal issues. For example, while a study may identify trends in vocal behaviours among adolescent singers, it may not provide detailed information about the specific anatomical or physiological differences that contribute to these behaviours in individual singers. This limitation hinders our ability to tailor interventions effectively to address the unique needs of each singer and may result in less targeted or less successful outcomes in vocal training and therapy.

The energy of the voice is intricately linked to our breathing patterns (Abitbol, 2006), with academic literature underscoring the significance of maintaining respiratory integrity throughout a singer's lifetime. Authors like Westermann Greg (1997) and others, such as LeBorgne (2021), translate this scholarly understanding into practical assistance by offering a range of physical stretches and exercises. These activities are specifically crafted to enhance vital capacity.

Warm-ups are crucial for preserving vocal function across all age groups, serving as vital preparations before extended periods of singing. However, for adolescent singers, they are especially crucial. These exercises prime the vocal tract by promoting blood circulation to the pertinent muscles and gently stretching the vocal folds, thus facilitating successful and controlled vibration, as noted by Callaghan (2014). Titze (1993), Miller (1986), and Estill (1996) are just a few vocal pedagogues who have devised such exercise regimes, outlining their objective as achieving a consistent vocal quality across a broad range of pitches as efficiently as possible.

For adolescent female singers, customising warm-up and exercise routines involves assessing individual vocal capabilities, limitations, and goals, considering the specific vocal challenges associated with puberty. Initially, pedagogues rely on general guidelines based on vocal technique principles, targeting relaxation, breath support, and pitch accuracy. Over time, adjustments are made based on student feedback and progress, ensuring a personalised approach tailored to each student's specific needs and challenges.

The growth of the larynx and the hardening of cartilages during puberty make the voice mechanism less flexible. Additionally, the protection provided by the three-layered structure of the vocal ligament, as highlighted by McAllister and Sjolander (2013), is crucial. Notably, the distinct three layers of the vocal fold typically develop around the age of 15, increasing the risk of vocal overuse prior to this development. As stated by Sataloff and Spiegel (1991), children possess ever-changing voices characterised by delicate muscles and fragile mucosa. To address these concerns, my artefact incorporates engaging and diverse exercises aimed at enhancing stamina and vocal quality while avoiding vocal exhaustion through repetitive, uninspired drills.

The strength and richness of one's voice aren't merely determined by the anatomical structures responsible for phonation but are interconnected with the overall physical and emotional health of the individual, as noted by Holt (1989). LeBorgne and Rosenberg (2021, p.235) emphasise that "the vocal mechanism relies on the physical condition of the body and mind." The impact of voice change of mindset and personality can cause things such as Lack of self esteem , changes in mood due to hormones , and these can impede successful phonation (Radionoff, 2020).

Adolescence is often marked by a pervasive lack of confidence and fear of embarrassment Schünemann, (2013). Dos Santos' study in 2022 revealed correlations between shyness and various phonatory problems. While shyness may contribute to a prioritisation of self-evaluation and a focus on less positive aspects of phonation, resulting in a quieter vocal output, it's important to note that not all individuals who lack confidence are necessarily shy. However, diminished volume alone can hinder successful phonation. Therefore, it's imperative for me to include extensive exercises aimed at modifying and maintaining vocal volume in my artefact.

Gantt chart

Task	Jan 2nd -14th	Jan 15th- 31st	Feb 1st- 13th	Feb 14th – 28th	Marc h 1st -15th	Marc h 16th – 31st	April 1st-22 nd	April 22nd – May 8th
Agree Topic								
Reading around topic								
Search and review books and articles								
Incomplete draft submission								
Create Artefact								
Use artefact in teaching studio								

Critical reflection on study process								
Draft study submission								
Rewrites and final submission								

Critical Reflection

In the transition from childhood to adolescence, girls undergo significant changes, not only physically but also vocally. This period, often overlooked in discussions of voice development, marks a pivotal time for young females. As they navigate through puberty, their vocal cords undergo transformations, leading to alterations in pitch, resonance, and timbre. These changes can affect not only how they sound but also how they perceive themselves and communicate with others. Understanding and supporting girls through this process is crucial for their overall well-being and self-confidence.

In academic 'white' literature, the vocal challenges arising from adolescent voice change are thoroughly documented, with successful interventions such as Stemple's Vocal Function Exercises exemplified (Sauder, 2010). Stemple's Vocal Function Exercises (VFEs) are a series of structured vocal exercises developed by Dr. Joseph C. Stemple, aimed at improving vocal coordination, strength, and endurance. These exercises target specific aspects of vocal function and are used in clinical practice for vocal rehabilitation therapy and vocal training

In the more practical 'grey' literature, recommendations for exercises tailored to adolescent voices are provided by authors like Miller (1986) and Ragan (2020), among others. However, the available material specific to girls' voices is notably less abundant compared to that for boys.

While voice change typically adheres to a predictable pattern in its impact on the body and voice, the timing of these changes remains highly unpredictable, contingent upon individual lifestyle, health, and physiology (Sataloff, 2020). Each person ages and experiences vocal changes uniquely, influenced by their personal history and life circumstances, all of which shape their phonation. This realisation prompted a reconsideration of my artefact's design. Initially conceived as a collection of foundational exercises with customisable elements tailored to individual student needs, I recognised the necessity to incorporate a diagnostic component. This section would include exercises specifically addressing common issues encountered in female adolescent voices undergoing change, such as breathiness or reduced volume, to facilitate a targeted assessment of each student's vocal challenges. By integrating diagnostic exercises tailored to address common issues, the artefact aims to provide personalised interventions that address the unique needs of adolescent singers undergoing vocal transition.

Through my exploration of scientific and medical journals, I unearthed insights into the crucial role of maintaining optimal physiology to safeguard vocal proficiency during adolescent voice change (Callaghan, 2014). Sustaining a healthy, tension-free interaction

between the respiratory and phonatory systems necessitates continual muscular control and exercise (Abitbol, 2006; Doscher, 1994). This revelation underscored the necessity of incorporating an additional section in my artefact devoted to Physical Well-Being. Within this section, I intend to provide recommendations for daily physical exercises aimed at promoting overall health and muscular coordination.

In my studio practice, I've observed that adolescent singers who maintain a consistent fitness regime tend to achieve better results. By increasing the amount of regular physical exercise undertaken, singers can enhance their oxidative capacity, leading to improved vocal efficiency (Sataloff, 2017; Mathieson, 2001). The type of physical exercise should vary to ensure a well-rounded fitness routine that targets different muscle groups and aspects of physical health. This variation can include activities such as cardiovascular exercises, strength training, and flexibility exercises, each contributing to overall fitness and vocal health in unique ways.

Furthermore, physical exercise should be brisk and regular to maximise its benefits for vocal performance. Brisk exercise increases heart rate and blood flow, promoting better oxygen delivery to the muscles, including those involved in vocal production. Regular exercise helps maintain physical fitness and endurance, essential for sustained vocal performance over time. Additionally, regular exercise contributes to overall health and well-being, which can positively impact vocal quality and resilience against vocal fatigue and strain. The type of physical exercise can vary but should be brisk and regular, elevating the heart rate. However, I recognise that for some singers unaccustomed to physical activity, incorporating regular exercise into their practice routine may be challenging. To address this, I aim to create exercises that are diverse, enjoyable, and stimulating, thereby encouraging those capable of doing so to continue with them.

Ethical Considerations

Ethical considerations in designing the artefact encompass a range of principles and practices. Promoting equity and inclusion is a critical aspect, ensuring that the artefact and its exercises are accessible and relevant to all students, regardless of their background, abilities, or identity (Johnson, 2019). This involves considering diverse perspectives, experiences, and needs, and striving to create a supportive and inclusive learning environment where every student feels valued and respected. Prioritising safety is paramount, with clear instructions provided to students to prevent injury or discomfort during vocal exercises. Supervision is essential to monitor students' responses and adapt exercises as needed to ensure their safety and well-being. Cultural sensitivity is also vital, with an awareness of and respect for cultural differences and sensitivities. It involves recognising and valuing students' cultural beliefs, practices, and values, and avoiding imposing cultural norms or expectations that may not align with their backgrounds.

Finally, accountability and transparency are essential aspects of ethical practice, with a commitment to taking responsibility for the outcomes of the artefact and its implementation. This involves being transparent about the methods, limitations, and potential risks associated with the exercises, and addressing any concerns or feedback from students or stakeholders promptly and professionally.

Conclusion

The subject of adolescent voice change in singers has captivated me for numerous years, prompting me to develop, refine, and employ a variety of exercises outlined in my artefact within my studio practice. Challenges have surfaced, notably with misunderstandings of specific exercises when learners rely solely on written instructions. Drawing from my personal encounters with such hurdles, I've strived to ensure utmost clarity in explaining the exercises. I've curated or devised simplified versions of these exercises to enhance comprehension and promote effective practice, especially for singers working independently.

Moreover, it's important to address the psychological aspect of vocal changes during adolescence. Many young singers may experience feelings of insecurity or frustration as they navigate these changes. By providing practical exercises and techniques aimed at improving breathing and volume control, the artefact not only addresses physiological aspects but also helps instil confidence and a sense of empowerment in young singers.

Additionally, the integration of research-based regimes from both academic 'white' literature and 'real-world practice-oriented' 'grey' literature ensures a comprehensive and balanced approach. This blend of theoretical knowledge and practical application, filtered through your extensive studio practice experience, enriches the artefacts effectiveness in meeting the diverse needs of adolescent singers.

Part 2 - Written Assignment .

Why Create My Artefact?

The motivation for this artefact arose from the lack of gender-specific resources for female adolescent singers facing voice changes without professional guidance. Perceived vocal challenges may discourage some adolescent female singers from pursuing their singing endeavours, prompting the creation of this comprehensive guide. It empowers them to establish a structured practice routine aimed at preserving vocal health and proficiency (Rayapati, 2012; Howe, 2020).

Regular singing is crucial for health, benefiting breathing capacity, laryngeal muscles, and overall well-being (Davis, 2000; Hobbs, 2016). Singing releases endorphins, potentially alleviating depression and boosting confidence. The artefact aims to increase singers' confidence by providing an accessible regime for more frequent singing sessions. Beyond physical benefits, singing enhances social confidence and self-esteem (Hobbs, 2016). Singing holds personal significance for many individuals, yet vocal issues during adolescence may erode confidence.

The artefact emphasises the importance of vocal and physical exercise for vocal health, providing knowledge and resources for effective execution. It offers tools to address specific vocal issues through a structured practice regime.

Historically, research predominantly emphasised male adolescent singing, delving into maturation stages, voice classification, and psychological factors (McKenzie, 1956; Cooper and Kuersteiner, 1970; Cooksey, 1977a,b,c, 1978; Groom, 1979). Yet, a recent shift shows female singers outnumbering males in choral programs (Bell, 2004; Clift et al., 2008; Clift and Hancox, 2010). Despite this, limited attention has been given to maturational effects on female singers. However, recent studies shed light on

characteristic symptoms of vocal change, impacting technique, repertoire, and self-concept (Bottoms, 1996; Huff-Gackle, 1987; Williams, 1996; Toole, 2003; Siple, 1994; Howard and Welch, 2002; Willis and Kenny, 2011). Unlike male voices significantly influenced by testosterone, resulting in distinct timbre and pitch changes, female voices undergo subtler modifications. Traditionally, vocal development research focused on males, neglecting females (Welch and Howard, 2002). Recognising the unique challenges of the female changing voice highlights the need for further research and attention. My artefact aims to empower female adolescent singers by addressing their vocal health and physiology, offering researched solutions to their vocal challenges.

Methodological influences

My research will adopt a pragmatic methodology, focusing on real-world problems and practical solutions (Mackenzie, 2006). It will be centred on addressing issues as they arise, recognising the dynamic nature of reality (Feilzer, 2010). By incorporating practitioner-based approaches, I will prioritise the integration of knowledge and action (Nelson, 2013). In conducting the literature review, I will employ specific inclusion and exclusion criteria to select relevant studies and resources. This will involve searching academic databases and scholarly sources for articles, books, and other publications that contribute to the understanding of female adolescent voice changes, vocal pedagogy, and practical interventions. I will prioritise recent and authoritative sources, as well as those that offer practical insights and solutions applicable to my research objectives.

The primary objectives of the literature review will be to understand both the 'what' and 'how' of the situation (Cresswell, 2014), utilising practical studio experience to bridge the gap between theory and practice, and to demonstrate the application of newfound knowledge (Nelson, 2013; Haseman, 2006). As I refine my project through active implementation in the studio, I will engage in both single- and double-loop learning, identifying and rectifying errors while also examining the underlying reasons for these errors and devising effective solutions (Hollnagel, 2009).

What is going on in the artefact and why?

My artefact presents a concise three-part daily core regime aimed at fostering consistent singing habits and improving vocal health. It begins with physical warm-up exercises to prepare the body for singing, promoting muscle relaxation, posture improvement, and tension reduction. This prioritises physiological readiness for enhanced vocal freedom (Smith, 2018). Following the warm-up, breathing exercises optimise respiratory function, supporting vocal endurance and breath control crucial for sustaining phrases and achieving clarity and power (Jones et al., 2018). The core regime also includes voice-specific warm-ups and targeted exercises to refine vocal technique and enhance stamina. By focusing on phonation and vocal control, these exercises build vocal strength, agility, and endurance, ultimately improving performance quality and expressiveness (Brown & Miller, 2019). By integrating these elements into the daily routine, the artefact provides a holistic approach to vocal training, emphasising physical and technical readiness for optimal performance (Lee, 2017).

Additionally, the artefact features a diagnostics section tailored to address common adolescent voice issues like breathiness, alongside a Physical Well-Being section inspired by sports science principles to optimise overall physiology for vocal performance. A

Collection component offers manageable repertoire to apply learnings practically, boosting vocal confidence and setting tangible progress goals (Morisano, 2010).

An Incidentals section is also included, featuring technological applications that can augment vocal training, such as the Vocal Pitch Monitor (Yamaoka, 2019) and SingScope (LLC, 2015). These applications are valuable for monitoring various aspects of phonation, including pitch accuracy and vibrato rates, and they provide a clear and easily comprehensible display of performance on computers or mobile phones. This is important because it provides real-time feedback on pitch accuracy during practice sessions. This helps female adolescent singers identify areas for improvement, track progress, and develop better vocal control independently. The app's feedback and motivation can enhance their practice efforts and overall vocal development.

In developing my artefact, I considered the societal pressure on girls to conform to physical ideals, often emphasising thinness. When coupled with the natural changes in body shape during adolescence due to growth and hormonal developments, it's understandable that teenage singers may lose connection with their abdominal muscles (Vocal Process, 2019).

Abdominal breathing, also known as diaphragmatic breathing, is widely recognised as the most efficient method for singers to inhale breath into their bodies. This technique involves the diaphragm contracting downward, allowing the lungs to expand fully and draw in air. While there are other types of breathing techniques, such as chest breathing or shallow breathing, abdominal breathing is preferred among singers for its ability to maximise lung capacity and support vocal projection and control. Utilising voiced and unvoiced fricatives during lessons or self practice can encourage abdominal engagement (Johnson M, Smith K, 2016). I need to bare all this in mind when creating my artefact and encourage gentle inward movement for the sound and emphasise the importance of releasing the breath.

Physiology

The initial section of my artefact, physiology, lays the foundation for proper singing technique. It includes exercises to promote optimal postural alignment and strengthen muscles essential for singing, particularly the respiratory muscles. Given the interconnected nature of vocal training, some exercises may be repeated across different core sections to ensure comprehensive development.

During female adolescence, hormonal fluctuations can affect muscle development and tone, potentially impacting respiration muscles and leading to changes in breath control and vocal production. Additionally, adjustments in vocal fold tissue elasticity can influence vocal quality and control as the voice matures (Gackle, 2012). Posture can be affected by voice changes through physical, emotional, and psychological factors. Rapid growth spurts may alter body proportions, including height and limb length, impacting overall posture as the body adapts to new growth (Beckett & Taylor, 2019). Voice changes may induce increased muscle tension in the neck, shoulders, and upper back as the vocal mechanism adjusts, contributing to poor posture like rounded shoulders or forward head posture due to tight and overactive muscles (Calais-Germain, 2016; DeVore & Cookman, 2009). Fluctuations in breath control and support may accompany voice changes during adolescence, potentially resulting in compensatory postural changes such as slouching or leaning forward to stabilise the body and support the voice (Miller, 1986; Riggs, 1986). Adolescent girls may experience shifts in body image and self-perception during puberty, influenced by societal pressures or concerns about physical appearance, impacting

posture and body language (Cash & Smolak, 2011). Emotional fluctuations related to voice changes may manifest physically as changes in posture, such as hunching or withdrawing. Thus, promoting awareness of posture and providing guidance on maintaining good postural habits can support healthy vocal development during this transitional period.

To address this concern, I've integrated a range of physical exercises into my artefact. These exercises vary from simple stretching routines, such as raising the arms overhead and clapping, which has been shown to elevate the shoulders and open up the chest (David, 2015). By incorporating these exercises, we aim to counteract the effects of hunching or slouching, thereby promoting better alignment of the spine and facilitating more efficient breathing. It's important to recognise that while elevating the shoulders can benefit some individuals, it may not be suitable for others, particularly those with preexisting shoulder or neck issues. Therefore, caution should be exercised when performing these exercises, and modifications may be necessary to ensure safety and effectiveness. Additionally, the artefact includes more advanced exercises involving resistance bands (see Fig. 1), providing a progressive approach to improving posture and supporting vocal development.

1. Hold the exercise band with palms facing upward, keeping the elbows close to the body. Squeeze the shoulder blades together and simultaneously spread the hands apart, mimicking the action of pulling out imaginary pockets and signaling you have no money.
2. Securely anchor the exercise band to a stable object. With arms straight, grasp the band and pull it up to shoulder level. Maintain focus on squeezing the base of your shoulder blades together throughout the movement.
3. Position the exercise band securely at waist level. Grasp it as if lifting a suitcase, and with arms straight, pull your hands behind you to a comfortable distance. Keep the squeeze in the base of your shoulder blades throughout the exercise.

Figure 1: Exercises using resistance bands (Source: Randall, 2020)

Resistance bands offer a beneficial option for female adolescents experiencing voice changes, providing a low-impact approach to exercise (Randall, 2020, pp. 62-3). Their adaptable nature engages stabiliser muscles, working multiple muscle fibres simultaneously and enhancing natural movement patterns (Freytag, 2020). Additionally, exercises focusing on muscular flexibility, such as those demonstrated by Westerman Gregg (see Fig. 2), prove valuable. These exercises prepare the body for efficient diaphragmatic and abdominal respiration, targeting the necessary muscles for effective breath control with clarity and accessibility (Westerman Gregg, 1997).

FIG. 1. It is highly recommended that these exercises be performed 10 times each, once a day, preferably in front of an open window, standing with feet comfortably apart for balance purposes. Upon rising in the morning is a good time, because the exercises promote a feeling of energy and verve for the coming day. (From ref. 9, with permission.)



Figure 2: Prephonatory stretching exercises (Source: Westerman Gregg, 1997)

In contrast, I incorporated a more physically demanding exercise tailored specifically for female adolescent voices by Donahue (2021, pp. 43-46). This exercise focuses on optimising rib cage and respiratory muscle expansion, targeting thoracic and abdominal musculature during both inhalation and exhalation. It involves bilateral stretching to increase the space between the superior hip and the inferior rib cage. Having previously introduced this exercise to students in my studio, I understood its significant impact on the respiratory capabilities of singers. The engagement of oblique muscles, often underutilised in daily activities, provided considerable benefits in terms of breath support when activated through the completion of the Donahue exercise.

However, despite recognising the benefits, I foresaw that many students could find the exercise to be too dull and lacking in engagement, failing to stimulate their imagination or provide a sense of challenge suitable for adolescents. Consequently, they may discontinue its use. Instead of removing the exercise from my artefact, I drew upon my own studio experience and academic knowledge to devise an alternative version of the exercise that was physically easier. This revised version incorporates a narrative approach involving corresponding patterns of movement, such as mimicking climbing the stairs, bending over to tie a shoe, waving a football scarf, or reaching arms up to capture a selfie from up high. While this modified approach may not yield the same level of benefits as the original exercise, it effectively stretches and activates the relevant muscles in a less intense manner, ensuring they are regularly engaged rather than left unused. Once the singer becomes proficient in this routine, they may feel prepared to progress to the original exercise.

Phonation

In this section, I focus on creating and improving the phonated sound, considering the needs of adolescent singers who often practice independently. Exercises akin to those found in Stemple and Titze's collections, originally designed for physical therapy, are included in the daily regime for their suitability for solo practice. Stemple's Vocal Function exercises, developed to strengthen voice production muscles, involve sustained tones on single notes and vowels performed softly (Stemple, 2010). A study by Sabol et al. (1995) demonstrated significant vocal improvements with consistent engagement in these exercises.

Titze's Semi-Occluded Vocal Tract (SOVT) exercises balance vocal tract pressure, enhancing vocal fold vibration and stability (Titze, 2001; VoiceScienceWorks, 2015). These exercises, such as vocalising through a straw, are particularly effective for independent singers. While Stemple exercises offer benefits, integrating them into the artefact raised concerns about student engagement. To address this, I infused creativity into the exercises, such as turning lip trills into painting-related movements, making them more enjoyable and motivating for consistent practice.

Additionally, I incorporated Howe's imaginary ball games for added fun and physical activity before vocalisation. Consistent practice, as emphasised by Callaghan (2014), is crucial for success, highlighting the importance of engagement and enjoyment in sustaining practice routines.

(Caldretti 2017) Noted some young female singers, particularly sopranos, may inadvertently lower their head voices too much into their middle and lower range. This tendency may stem from a lack of middle voice due to their mutational chink, leading to difficulty in naturally transitioning to chest voice on lower notes (D4 and below). To address this, she suggested to guide them to experience the sensation by speaking on pitch in lower notes and encouraging them to "dig in" as they approach the lower part of their range (See figure 3). This exercise serves multiple purposes: firstly, it heightens sensory awareness by making students more attuned to the physical sensations associated with vocal production. Secondly, it engages the vocal muscles more intensely, leading to improved control over pitch and resonance. Additionally, practicing speaking on pitch in lower notes gradually expands the vocal range downwards, allowing for greater ease and clarity in accessing lower registers. Furthermore, the emotional depth and richness associated with lower pitches can be tapped into through this exercise, fostering a deeper connection to the voice and the music being performed. Overall, integrating this exercise into vocal training routines can contribute to technical proficiency, vocal strength, and emotional expression.



FIGURE 3. Exercise to find lower voice through speech. To be sung in transposition (Source Cadlretti, 2017, pg 28)

Additionally, Sundberg, J (1997) suggests exercises utilising forward consonants like [m] and [n] prove effective in addressing this challenge (see figures 4 & 5). These are effective for several reasons. Firstly, these consonants encourage a forward placement of the voice, directing resonance towards the front of the mouth and nasal cavity. This forward resonance can help counteract the tendency to lower head voices too much into the middle and lower range, promoting a more balanced and consistent vocal tone across different registers. Additionally, the articulation of these consonants requires precise control of the vocal mechanism, particularly in the pharynx and soft palate (Stark, j) Practicing these exercises can strengthen these muscles and improve coordination, aiding in the smooth transition between registers and facilitating a more seamless connection between chest and head voice. Overall, incorporating exercises utilising forward consonants can help young female singers develop better vocal technique, enhance vocal flexibility, and achieve greater control over their vocal range. I have included these exercises ,which will be familiar to the majority of singers.



FIGURE 4. Exercise to find forward placement in the middle voice. To be sung in transposition on “muh” and “mah” (Source Cadlretti, 2017, pg 28)

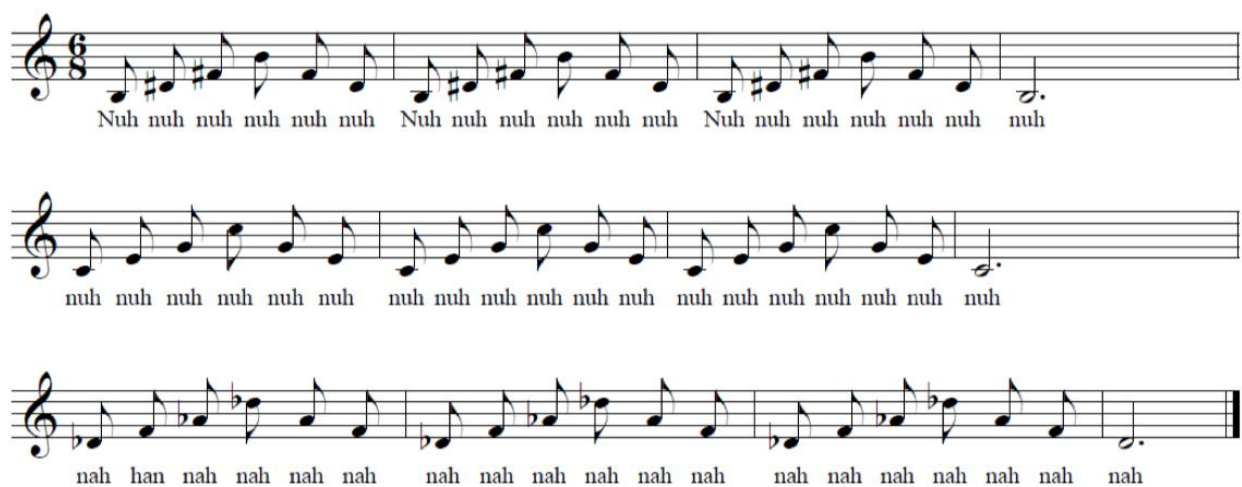


Figure 5. Exercise to blend the registers. To be sung in transposition on “Nuh” and “Nah”. (Source Caldretti, 2017, pg 29)

Comparing the two exercises, both speaking on pitch in lower notes and utilising forward consonants like [m] and [n] serve to improve vocal technique and address specific challenges faced by singers, albeit in slightly different ways. The exercise of speaking on pitch in lower notes focuses on engaging the vocal muscles and expanding the vocal range downwards, promoting greater vocal strength and control. It encourages sensory awareness and emotional connection to the voice, enhancing overall vocal performance. On the other hand, exercises utilising forward consonants like [m] and [n] aim to encourage a forward placement of the voice and counteract tendencies such as lowering head voices too much into the middle and lower range. These exercises target specific vocal resonance and articulatory mechanisms, aiding in the smooth transition between registers and promoting vocal balance and consistency.

While both exercises are valuable tools in vocal training, they target different aspects of vocal production and address distinct challenges. Incorporating a combination of both exercises into vocal practice routines can provide comprehensive training and help singers develop well-rounded vocal technique.

In my artefact, I have incorporated several exercises that may be novel to singers. Introducing novel exercises in the artefact prompts singers to explore new vocal challenges, fostering creativity and adaptability. This approach enhances cognitive engagement and deepens understanding of vocal technique, preparing singers for diverse musical styles and challenges. These exercises include inspiratory vocal fry exercises. These exercises involve producing a low-pitched, creaky sound during inhalation, which engages the vocal folds in a distinctive manner. The technique of Inspiratory Vocal Fry (IVF) can aid in achieving a higher contraction of the cricothyroid muscle, resulting in a wider vibratory cycle that enhances the massaging effects on the vocal folds' mucosa, thereby facilitating elasticity (Paolillo, 2021).

Engaging in inspiratory vocal fry exercises encourages the controlled closure of the vocal folds during inhalation, strengthening them and fostering improved vocal coordination, particularly beneficial during periods of voice change. Utilising these exercises as a warm-up technique can also help alleviate tension in the vocal folds, promoting a more resonant and balanced vocal tone. Moreover, they contribute to vocal health by promoting proper vocal fold closure and reducing vocal strain, which is especially pertinent for adolescent singers undergoing changes in their vocal function.

Furthermore, these exercises encourage singers to explore various vocal sounds and sensations, enhancing their awareness of their vocal instrument. This exploration can empower adolescent singers as they navigate through the fluctuations in their voice. While learning new techniques may be more straightforward in a face-to-face setting, my artefact includes a meticulously crafted explanation of how to produce the required 'creak', along with methods for verifying the correct sound production.

Several exercises in my artefact prioritise therapeutic benefits over aesthetic appeal, acknowledging the transitional nature of the adolescent voice. Just as Radionoff (2020) underscores the need to adapt to 'new normals' with aging, I've curated exercises aimed at assisting young singers in navigating and improving their evolving voices, regardless of whether they resemble their previous vocal qualities.

Physical Well Being

In the Physical Well-being section, I recommend exercises to maintain physical fitness, crucial for supporting vocal maturity (McKinney & Harris, 2004). Posture-enhancing exercises can counteract changes during adolescence, aiding vocal alignment (Welch, 2014). Activities like cardiovascular workouts and core exercises improve lung capacity, muscle tone, and respiratory control, essential for vocal transitions (Kirsch & Merati, 2019; Davis, 2000). Regular physical activity reduces muscular tension, promoting relaxed, resonant vocal quality (Paolillo, 2021). Research highlights the importance of sustained effort for vocal progress (Sundberg, 1987; Watson et al., 1985), with studies indicating that daily moderate to vigorous activity positively impacts vocal health and performance (Smith et al., 2018; Patel et al., 2020). Following NHS guidelines for at least 60 minutes of daily activity enhances overall fitness, respiratory function, and vocal stamina (NHS, 2024; Jones et al., 2017; Brown et al., 2019). Including aerobic exercises like cycling and strength-building activities such as running or dancing supports vocal quality and performance demands. A flexible exercise log integrates physical activity into daily routines, accommodating various preferences and lifestyles (Brown et al., 2019).

Diagnostics

In my artefact, I devised a core daily regime consisting of a curated collection of exercises aimed at establishing a structured routine for effective practice sessions. Additionally, I integrated a Diagnostics section to address common vocal concerns, such as excessive breathiness or vocal strain. The Diagnostics section, serves as a tool for both teachers and students to identify and address common vocal concerns. Teachers can use it to diagnose issues during lessons and tailor their instruction accordingly, while students can utilise it for self-assessment and targeted practice outside of lessons. Overall, these sections aim to enhance the teaching and learning experience by providing guidance and support for vocal improvement. These exercises target specific vocal issues and provide practical solutions. For instance, Semi-Occluded Vocal Tract (SOVT) Exercises, included in this section, have been shown to alleviate vocal strain by enhancing vocal fold efficiency through airflow resistance, facilitating more optimal vibration (Sundberg, 1987).

I was delighted to demonstrate that the exercises outlined in the Phonation section, aimed at enhancing vocal efficiency, could offer multiple benefits without overwhelming the singer with an extensive list of corrective measures. Brunssen (2020) proposes that addressing vocal issues should involve a structured series of exercises targeting each specific "symptom," to be performed consistently over a period of time. By incorporating versatile exercises like SOVT or those by Stemple, which address various aspects of vocal technique, singers can experience broader benefits from the regimen in a shorter timeframe.

Vocal strain in adolescent singers can stem from various factors, including normal processes of voice change such as the growth of the larynx and vocal folds, as well as insufficient breath support. However, repertoire choices can further contribute to vocal strain. Selections that are vocally demanding or require a range that is not yet fully developed can impose undue stress on the voice. Additionally, songs with challenging parts or prolonged periods of singing in a high or low range can strain the vocal folds, especially if proper vocal technique is lacking. Therefore, it is crucial for adolescent singers to select repertoire that aligns with their current vocal capabilities. Working with a vocal coach or teacher who can offer guidance on healthy singing practices and repertoire selection is highly beneficial. In the collection section of my artefact, I included a diverse range of songs not only to allow singers to apply their learning creatively but also to introduce them to new styles of repertoire they may not have explored before.

Incidentals

Within my artefact, I've carefully curated a collection of vocal exercises not only for their vocal benefits but also for their ability to engage and foster repetition. Callaghan (2014) highlights the importance of consistent repetition in vocal exercises, emphasising its pivotal role in enhancing vocal proficiency. However, balancing consistency with diversity presents a challenge. While consistent repetition is essential for mastering vocal techniques, Edwin (2012) recommends incorporating a diverse range of patterns in exercises to prevent memorisation and potential disengagement. Striking the right balance between consistency and diversity is crucial for sustaining student interest and maximising the effectiveness of vocal practice sessions.

Consistent, daily practice is essential for maintaining vocal health and skill, especially in adolescent voices undergoing changes. In developing my artefact, my aim was to establish a structured regime that would enable adolescent singers to integrate beneficial vocal practices into their daily routines. Engaging in regular, gentle vocal exercises that cover the entire vocal range while paying attention to breath control can help navigate the challenges posed by the transitional stages of the adolescent voice (Howe, 2020). These exercises play a vital role in promoting coordination among the respiratory, laryngeal, and resonance systems, with greater frequency leading to improved vocal health and proficiency in adolescent voices.

How has "Grey" knowledge influenced the development of the artefact?

In developing my artefact, I've extensively utilised academic research from peer-reviewed journals, often referred to as "white" literature. Additionally, I've incorporated insights from practitioners found in books, informal scientific papers, and online resources, collectively known as "grey" literature. This diverse range of sources, particularly those authored by studio-based practitioners, offers a practical perspective rooted in experience alongside academic knowledge (Adams, 2017). Grey literature prompts discussions on bridging the gap between theoretical understanding and practical application (Rayapati, 2008). When selecting grey literature, I carefully evaluated the expertise of the authors and organisations to ensure the credibility and relevance of the information. To ensure the credibility and relevance of the information, I employed a systematic approach to evaluate the expertise of the authors and organisations included in my research. This involved establishing clear inclusion and exclusion criteria to guide the selection process. The criteria considered factors such as the author's qualifications, academic credentials, reputation in the field, and relevance of their work to the topic at hand. Additionally, I assessed the credibility of the organisations based on their reputation, expertise, and contributions to the subject matter. By adhering to these criteria, I aimed to ensure that the information sourced from these sources was reliable, authoritative, and directly applicable to the objectives of my research.

My exploration underscores the significance of integrating embodied and experiential knowledge with academic scholarship, particularly as practitioners endeavour to translate theoretical findings into practical applications and devise pragmatic solutions for real-world challenges.

Through my research, I've come to appreciate the integration of experiential knowledge with academic scholarship, particularly evident in practitioners like Jenevora Williams. Her work falls within the realm of "grey literature," bridging academia and practical application. Jenevora Williams' work represents a unique blend of academic rigor and practical

application, effectively bridging the gap between scholarly research and real-world implementation. While "grey literature" typically refers to non-traditional sources of information, such as reports, theses, or conference proceedings, Williams' contributions stand out for their depth of insight and applicability to vocal pedagogy. As a renowned vocal coach and researcher, Williams brings a wealth of practical experience to her scholarly endeavours, ensuring that her work remains grounded in the realities of vocal training and performance. By seamlessly integrating theoretical knowledge with practical insights, Williams offers valuable resources that resonate with both academics and practitioners in the field. Thus, her work serves as a bridge between theoretical understanding and practical application, enriching the discourse on vocal pedagogy and enhancing the effectiveness of vocal training methods. While Williams engages in scholarly discussions on vocal pedagogy, her emphasis on real-world solutions and insights from her coaching experience distinguishes her work. This blend of theoretical understanding and practical wisdom mirrors the essence of grey literature, offering valuable contributions beyond traditional academic avenues. As an illustration, consider the following exercise:

Onset exercise:

This is to practice the difference between the three types of onset, it will also help to reduce breathiness. Sing on a short open vowel (probably 'ee') and repeat it three or four times. Firstly sing 'hee' 'hee' 'hee'. This is the breathy onset. Then sing an 'ee' vowel with a glottal click – this requires a feeling of closing the throat before allowing the sound to burst through. Now try and make the click as light as you can on the repeated vowel. Lastly, sing the 'ee' vowel as if you were starting it with a silent 'h'. The onset will be clean, not breathy and not clicked. This exercise is best done quietly and gently.

Figure 6 Onset Exercise . (Source: Williams, 2012 Page 6).

This exercise exemplifies the fusion of scientific knowledge and practical application in the studio, showcasing the value of "grey" literature in bridging theory with real-world practice in vocal pedagogy.

Another example addresses the documented issue of poor posture in adolescent singers, with "grey" literature offering practical solutions used in studios despite initial concerns about potential laryngeal damage. Exercises aimed at improving posture, drawn from academic literature and practical insights, were incorporated into my artefact.

Additionally, "grey" literature highlights nuanced teaching techniques tailored to individuals' backgrounds and physiologies. Practitioners like Radionoff (2018), Brunssen (2018), and Rayapati (2008) inform my artefact's development, ensuring exercises accommodate diverse learner needs.

Conclusion

In crafting my artefact, I remained mindful of the central aim: to focus on the research inquiry and its outcomes rather than solely on the creative process itself, as emphasised by Nelson (2013). While navigating this balance, I occasionally found myself drawn more towards the allure of crafting a new work and integrating it into the teaching studio, rather

than fully articulating the research process and its connection to the artefact's development. Schön posits that the reflective practitioner must "make new sense of the situations of uncertainty or uniqueness which he may allow himself to experience" (Nelson, 2013). Initially, I approached this research with a sense of assurance, only to encounter a shift towards uncertainty as I delved deeper into my topic. My original intention was to create a generalised artefact, yet through extensive research, I realised this approach was inadequate. The complexity of the issue became apparent, leading me to recognise the limitations of my initial plans. Employing double-loop learning and a hermeneutic process, I broadened my understanding through comprehensive exploration and revisiting key areas, adjusting my perspective, objectives, and refining my knowledge along the way.

In essence, my artefact centres on the fundamental pillars of effective singing: physiology, respiration, and phonation methods, all underpinned by regular physical activity. As highlighted by David (2015), consistent physical and vocal practice yields the greatest benefits. To counteract the tendency towards mindless repetition in practice routines, I aimed to refocus singers' attention on maintaining vocal health and proficiency. By offering a diverse range of vocal exercises and activities, my goal was to support the establishment of a "new normal" in vocal performance, as advocated by Radionoff (2020).

Embarking on this research journey has been immensely fulfilling, and the resulting artefact stands as a testament to the intersection of theory and practice in vocal pedagogy. Reflecting on the process, I'm reminded of the words of John Dewey, who stated, "Education is not preparation for life; education is life itself." (1938, pg13) In a similar vein, this project has not merely been about creating a tool for singers but has been a holistic learning experience, encompassing both the scholarly pursuit of knowledge and the practical application of that knowledge in the realm of vocal performance and teaching.

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