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A reflective narrative overview: How can voice teachers use imagery within Evidence-Based Voice Pedagogy to effectively enhance student retention?

Component 1: Portfolio (1650 words)

Introduction

Over twenty-five years of teaching students of all ages, I have integrated scientific knowledge with imagery in my teaching style, using a blended approach (Brown 2021; 2023; 2024; Keenze and Bell, 2005, cited in Robbearts, 2014; Latukefu and Verenikina, 2011; Ware, 2013). I have employed various techniques, such as verbal instructions, vocal modeling, and bodywork. Though common in France, I have begun to question whether this blended approach is the most effective way to support students' motor learning development.

In my recent professional practice, I have become more intentional in using imagery by exploring the dynamic imagery method, developed by Swiss dancer and movement educator Eric Franklin (2012). In parallel, I initiated a group class focused on anatomy and physiology for high school students at Maîtrise de Radio-France, the children's radio choir. These practical experiences raised several questions. How does imagery contribute to motor learning? What are its strengths and limitations? Is it more effective to use a blended approach, which combines implicit and explicit instruction, or a multimodal approach that purposefully distinguishes between them and adapts to the student's individual learning style?

Building on my professional practice, this reflective narrative literature review critically examines the role of imagery and its integration within an Evidence-Based Voice Pedagogy (EBVP) framework, as defined by Ragan (2018), at the intersection of voice research, voice teacher expertise and experience, and student goals and perspectives (p. 159). It also explores how a more critical approach to imagery can serve as a valuable resource for voice teachers and students, effectively enhancing various aspects of their procedural learning, including motor skill retention.

Context

The debate on voice science and imagery has been a central theme in vocal pedagogy for many years, with extensive documentation (Freed, 2000; Lillis, 2020; Brown, 2021; Ware, 2013). Imagery has faced widespread criticism for using metaphorical language, which can be unclear and confusing (Sansom, 2016; Jacobsen, 2013; Williams, 2019, cited in Brown, 2023) or misinterpreted and misleading (Harrison, 2018; Nix, 2013; Welch *et al.*, 2005). Additionally, inaccurate imagery (Brown, 2024; Harrison, 2018; Nix, 2013) and the use of "stock imagery" (Brown, 2021; 2024)—defined as images passed down through generations without rigorous critical examination—have faced significant criticism and reinforced the divide. However, a blended approach has been shown to be common among voice teachers in the USA and Canada (Ware, 2013). Ware's survey suggests that the debate between science-oriented and imagery-oriented practitioners may have been overstated, fueled by the ongoing debate in professional literature. This study aims to offer a fresh perspective on the use of imagery in vocal pedagogy, acknowledging the divide between science and imagery, while striving to move beyond it.

Aims

- To define imagery and critically evaluate its efficacy as both a teaching and learning tool in the voice studio.
- To examine the role of imagery in students' retention of motor learning skills in the voice studio, with particular attention to procedural learning and focus of attention.
- To identify potential guidelines that support voice teachers' reflective use of imagery.
- To identify strategies for multimodal teaching within an EBVP.

Objectives

- To critically evaluate technical concepts and images, such as yawn, in-breath, open throat, or space, through the lens of scientifically accurate imagery informed by literature and practice.
- To analyze how imagery interacts with focus of attention in procedural learning, informed by literature on motor learning theory and practice.
- To identify and formulate strategies for intentionally incorporating imagery techniques into voice teachers' practice, supported by a reflective, student-centered pedagogical approach within EBVP.
- To examine how different teaching styles and learning preferences may inform multimodal pedagogy within EBVP.

Personal learning outcomes

- To examine topics such as internal and external focus of attention and their implications for imagery use.
- To understand how to integrate and rationalize grey literature into an independent study.
- To learn how to effectively engage with cross-referencing—that is, collecting, analyzing, and synthesizing literature on imagery from fields other than voice pedagogy, such as sports science.
- To enhance my proficiency in coding and memo-writing with MaxQDA, analyzing literature as data, and systematically documenting my critical analysis and reflection.
- To gain insights into the methodologies of different types of literature reviews and to become a more autonomous researcher.

- To reflect on my role as a teacher and researcher and on my ongoing contribution to the Association of French Voice Teachers (AFPC)

Activities

- To acquire knowledge regarding MaxQDA through instructional booklets and video resources.
- To engage in short academic courses, such as acoustics.
- To engage with scholarly literature in vocal pedagogy to maintain an up-to-date understanding of vocal concepts.

Methodology

Preliminary search and research question design

Even though this is a desk-based study, it is grounded in practitioner research, a field that is receiving increasing attention in the development of voice studies (Nafisi, Forbes and Foulkes, 2024; Winter, 2023; American Academy of Teachers of Singing, 2025). As Forbes (2024) advocates, my research question is rooted in professional practice to produce meaningful insights for fellow practitioners. Following an initial literature exploration (Green, Johnson, and Adams, 2006) and guided by tutor feedback, I undertook a “refinement and iteration” process (Purvis, Nicholas, and Tai, 2024, p.3), leading to the final title of the review.

Theoretical frameworks

This narrative review uses EBVP as a theoretical framework, grounding the topic in evidence-based practice and encouraging student agency. It also draws on motor-learning theory (Wulf and Lewthwaite, 2016)—particularly the focus of attention, implicit and explicit memory—to inform the critical analysis. Because pedagogy serves both as the topic and the method of inquiry, the report's structure employs Borton's reflexive model, known as the “what, so what, now what” model (1970), to mirror a pedagogical learning loop.

Rationale for the choice of methodology

I use a reflective conceptual approach to critically examine imagery in vocal pedagogy, its effectiveness in motor learning retention, and the practical implications for voice teachers. It aligns with Forbes (2024), whose method focuses on interpretation and broader theoretical insights rather than causal relationships. It aims to explore and clarify broad topics—such as imagery and retention—rather than test hypotheses, generalize, or build theory. Consistent with this view, I chose a narrative review instead of systematic, scoping reviews, or thematic analysis.

It supports the development of a conceptual synthesis across disciplines, encouraging a reflexive and subjective approach within a flexible framework, unconstrained by the need for replicability. As suggested in the methodology literature, my goal is not just to summarize existing research but to analyze and interpret it, presenting a clear conceptual perspective, what Sternberg (1991, cited in Baumeister and Leary, 1997, p. 7) calls a “take-home message.”

Regarding coverage, I don’t intend to be exhaustive, like in a scoping review (Cooper, 1988, cited in Randolph, 2009). While I use MaxQDA (<https://www.maxqda.com/fr>) to code all references and for memo-writing, it is not for inductive theme generation but rather to compare how key concepts, such as imagery function or focus of attention, are treated by different authors (see Appendix A for a list of codes). Although not a thematic review, I treat literature as data, aligning with authors who identify commonalities between primary and secondary research (Bern, 1987, 1995, cited in Baumeister and Leary, 1997; Randolph, 2009; Onwuegbuzie, Leech, and Collins 2012; Boote and Beile 2005, cited in Winter, 2023). Consequently, I have carried over the MaxQDA skills I learned in the previous work-based research into this one.

Data selection/ inclusion and exclusion criteria

To interpret, synthesize, and evaluate literature from music education, sports science, and neuroscience, I employ cross-referencing, a strategy recommended by Snyder (2019, p. 333) for handling “disparate and interdisciplinary” research. It helps address the gap in empirical studies in vocal pedagogy. Fletcher, Davidson, and Krause’s (2020)

literature review on teachers' expertise serves as a methodological example of cross-referencing, which inspires my use of the same technique. I extensively draw on Fournier, Deremaux, and Bernier's (2008) study about athletes' use of mental imagery, as it provides both valuable conceptual insights into imagery function and pedagogical perspectives on variables like ability and level of expertise.

Peer-reviewed articles from leading journals such as the *Journal of Singing, Voice and Speech Review*, and *Psychology of Music* are primarily selected, ranging from 2000 to 2025, with Munroe *et al.*'s (2000) study serving as a chronological starting point. Seminal works by authors such as Richard Miller and William Vennard are cited as secondary sources. I use grey literature sparingly, including book chapters and theses, only when they hold distinct conceptual insight.

Articles are included based on their relevance to the topic, using a purposive sampling approach (Randolph, 2009). I exclude articles that focus exclusively on the use of imagery in choral environments or that center on children's and adolescents' voices, as these are outside the scope of this review.

Search strategy

My search strategy includes "pearl growing", using articles previously collected in Mendeley (<https://www.mendeley.com>) and backward and forward citation chaining to expand data collection (Boell and Cecez-Kecmanovic, 2014; Winter, 2023). It also searches databases, such as the online library of the University of Wales Trinity Saint David (UWTSD) and Google Scholar (<https://www.scholars.google.com>). Boolean operators—AND, OR, and NOT—are used with keywords such as imagery, imagination, vocal pedagogy, singing, motor learning, skill retention, focus of attention, implicit/explicit learning, and self-regulation to refine the findings (Bell, 2007). Manually scanning the table of contents of recent publications of the *Journal of Singing, Voice and Speech Review*, and *Australian Voice* contributes to further identification of relevant literature.

Limitations

This study lacks generalizability and replicability due to its subjective and interpretive approach. Furthermore, despite an iterative search process aiming for saturation, purposive sampling may result in the omission of relevant sources.

Ethical considerations

Since it is an independent desk-based study, there is no requirement for ethical approval. Tools such as MaxQDA and Mendeley help maintain transparency and research integrity. Additionally, the critical reflection, supported by a reflexive journal, enables me to reflect on my positionality as an insider researcher, acknowledging the role of subjectivity in shaping the literature review. I follow the Voice Study Centre AI Policy.

Component 2: Project report (6549 words)

Introduction

In the context of EBVP, voice teachers have been cautious about using subjective images (Brown, 2024; Sell, 2005, cited in Brown, 2021; Ware, 2013) and sensation-based instruction (American Academy of Teachers of Singing, 2014; Michaël, 2015). Considering recent scientific developments in neuroscience and motor learning theory, the American Academy of Teachers of Singing (2025) has refined its stance on the latter, transitioning from a positivist paradigm, in which voice science dominated vocal pedagogy, to a pragmatic one that allows for the integration of embodied knowledge. It acknowledges the metaphorical nature of language and the role of subjectivity in procedural learning. Consequently, the Academy emphasizes the necessity for a “Pedagogy-Informed Voice Science” to complement the “Science-Informed Pedagogy” model (American Academy of Teachers of Singing, 2025, p. 505), which integrates scientific research and field expertise, aligning with the practitioner-led research perspective previously discussed (Nafisi, Forbes and Foulkes, 2024; Winter, 2023).

As part of the profession’s broader paradigm shift and in alignment with EBVP, this research aims to place students, their learning, and subjectivity at the heart of pedagogical considerations. It also involves examining and evaluating different teaching approaches — whether teaching voice as a whole or breaking down its components (Bergan, 2010) — as well as the pedagogical implications these approaches have for

teaching styles. This study seeks to contribute to the exploration of teaching tools, such as imagery, and their potential to enhance student agency.

Part one: What? The use of imagery in voice pedagogy

Definition

Imagery refers to a symbolic sensory experience that mimics real experiences and can occur through any sensory mode (White and Hardy, 1998, cited in DeSantis, Deck and Hall, 2021; Fournier, Deremaux and Bernier, 2008). It has been defined by Brown (2023) as a means of clarifying subjective concepts by expressing one idea in terms of another. This aligns with Aristotle's definition of metaphor in *Poetics*—naming one thing while referring to another—which he saw as central to how human beings understand and interpret the world, as discussed in Williams and George (2016). In the context of vocal pedagogy, Harrison's negative definition of imagery (2018) distinguishes it from unclear vocal guidance, emphasizing its role as a precise tool for nurturing the invisible vocal instrument.

Imagery as a solution for challenges related to the vocal instrument

Voice teachers often lack visual imagery of the voice's internal mechanisms, which makes it inherently challenging for them to explain how vocal sounds are produced (Brown, 2023; Ware, 2013). Consequently, they employ alternative instructional strategies that primarily involve sensations and imagery (DeSantis, Deck, and Hall, 2021). A simile, defined as a figure of speech that compares two things using words such as 'like' or 'as,' can help clarify the unseen aspects of voice production (Harrison, 2018). Common similes include describing the diaphragm as dome-shaped and the cricoid cartilage as ring-like.

This may seem counterintuitive, but the literature reports limited sensory perception associated with the vocal instrument. As noted by Michael (2015), one cannot feel the body parts involved in singing while performing. Moreover, essential anatomical elements of voice technique, such as the velum and diaphragm, lack proprioceptive receptors (Michael, 2015; Williams and George, 2016). Relying solely on sensory strategies is not as effective as using metaphorical methods, as sensory perception can sometimes be flawed (Bedford, 2012, cited in Brown, 2024). In my practice, I have

observed that although often employed to compensate for the lack of visual and sensory feedback, imagery may, if not critically evaluated and individually adapted to the student's level of expertise, introduce more confusion than clarity, a view supported by Brown (2024). Some students did not relate to images such as 'breathe as if smelling a rose' or 'as if surprised with joy,' even though these were meant to encourage a balanced inhale with slight soft palate elevation.

Singer's use of imagery

Singers use imagery in a wide variety of situations, such as voice lessons, choir rehearsals, practice sessions, and performative contexts. Munroe *et al.*'s pivotal study (2000) on the nature of imagery use in sport, referred to as "the four W's of imagery use"—where, when, why, and what— (p. 119), has played a key role in examining imagery in diverse fields, including music (Bowes, 2009; Brown, 2023). In his book *Dynamic alignment through imagery*, Franklin (2012) further develops Munroe's framework by incorporating a fifth question, namely, "who." This addition is especially relevant when considering the context of student-led pedagogy within EBVP.

Building on the structural framework of imagery proposed by Munroe *et al.* (2000), Fournier, Deremaux, and Bernier (2008) present a dynamic model that emphasizes imagery's functionality. They define "function" as the reason behind imagery, "content" as what it entails, and "characteristics" as how it is executed, thus enhancing Munroe *et al.*'s original model. Their model may be helpful for critically evaluating the effectiveness of imagery use by musicians related to function. However, the duration and amount of images must also be considered, in addition to function, content, and characteristics (DeSantis, Deck, and Hall, 2021; Lotze, 2013).

Imagery types and characteristics (what and how)

Mental imagery has been defined as the content of what is imagined, which can be processed through various senses, including visual, auditory, kinesthetic, and olfactory (Fournier, Deremaux and Bernier, 2008). Specifically, the main types of imagery identifiable are "visual, aural, verbal, kinesthetic, and emotional" (Holt, 1964; Paivio and Begg, 1981, cited in Brown, 2023, p.2). Due to imagery's inherently multifaceted properties (DeSantis, Deck, and Hall, 2021), musicians' mental imagery tends to be multimodal, integrating various types of imagery (Lotze, 2013). As suggested by Fournier Deremaux and Bernier (2008), the characteristics of mental images correspond to how

they are imagined, including varying “speeds, vividness, and persistence” (p.737). This aligns well with Ortony’s perspective on metaphors which argues that crucial characteristics such as “inexpressibility, vividness, and compactness” shape the effect of mental images (1975, cited in Brown, 2024, p. 5).

Imagery function (why) and timing (when)

The function of imagery, or the reason behind images, can be multiple: cognitive, motivational, artistic, health-related, or spontaneous (DeSantis, Deck and Hall, 2021; Fournier, Deremaux and Bernier, 2008). Indeed, imagery can be used to develop vocal technique, enhance artistic expression—especially character building—facilitate mental preparation, and reduce music performance anxiety (MPA) (DeSantis, Deck and Hall, 2021). As posited by the American Academy of Teachers of Singing (2025), from the practical perspective of vocal pedagogy, descriptive language plays a significant cognitive role in enhancing procedural skills and inspiring improvement. Additionally, function determines not only the types of images but also the timing of imagery, or “when”: it can occur prior to singing (“audiation”), during singing (to enhance tone quality and expressiveness), or outside of singing (for mental preparation) (Lotze, 2013).

Audiation

Musical imagery, as defined by Godøy and Jørgensen (2001, cited in Schippers, 2006), can be understood as our capacity to envision musical sounds even in the absence of an actual sound source. This cognitive phenomenon, enabling us to recall, re-experience, or create new music in our minds, has been termed “audiation” (Brodsky *et al.*, 2008, cited in Lotze, p. 1; Gordon, 2011, cited in Steenstrup *et al.*, 2021, p.2). Audiation plays a significant role in singing, as the brain initiates phonation, resulting in a smooth, balanced sound when a singer accurately envisions the note’s tone before performing (Callaghan *et al.*, 2012, cited in Brown 2023; Patenaude Yarnell, 2003).

Imagery as cognitive strategy

Professional singers use directional imagery to enhance vocal production efficiency and stability (Sundberg, 1987; Titze, 1994, cited in Moorcroft, 2007). This type of imagery helps efficiently monitor subtle adjustments in the vocal tract, posture, and breathing mechanism (Moorcroft, 2007). As it impacts psychological conditions and activates the sensory-motor system, imagery can also lead to physical changes in students and inspire

vocal gestures in the voice studio, which enhance performance in a healthy way, particularly through finding the right metaphor (Williams and George 2016). As explained by Harrison (2018), various types of imagery—motor imagery (associated with action and movement), kinesthetic imagery (linked to experiential sensations), and other forms, whether used alone or in combination, can be used to train muscles for singing, similar to methods employed in dance.

As previously established, mental imagery can trigger a physical reaction in parts of the vocal system that are hidden or usually not regulated by proprioception (Brown, 2023; DeSantis, Deck, and Hall, 2021; Harrison, 2018; Michael, 2015; Ware, 2013). Additionally, it plays a crucial role in enabling students to understand scientific concepts in a practical manner, connecting declarative (what) and procedural (how) knowledge. This is supported by Latukefu and Verenikina (2011), who promote a blended imagery approach that combines scientific principles with creativity to improve learning. This aligns with Williams and George's (2016) view of metaphor as an integrative cognitive strategy, enabling the connection of different learning domains. Schippers (2006) likewise highlights the metaphor's role in clarifying complex concepts for musicians training to become performers or educators. Furthermore, imagery can be used to memorize a sung piece (DeSantis, Deck, and Hall, 2021) or a vocal gesture by allowing voice teachers to help students capture a sensory experience of a vocal skill they have mastered (Patenaude-Yarnell, 2003).

Imagery as external focus of attention

Researchers in vocal pedagogy and music science (Atkins, 2017; Atkins and Duke, 2013; Holding, 2015; Holding, 2016; Robertson, 2025; The American Academy of Teachers of Singing, 2025; Steenstrup *et al.*, 2021; Treinkman, 2021) widely accept findings from motor learning research, which indicate that an external focus of attention enhances motor learning and performance more effectively than an internal focus on the body's mechanics (Mornell and Wulf, 2019; Wulf *et al.*, 2010; Wulf, 2013). Imagery and figurative language, as noted by Treinkman (2021), are often classified as external targets. A prime example of an effective external stock image is forward resonance, often referred to in traditional vocal pedagogy as "singing in the mask," as it helps divert attention from the larynx (Vennard, 1968, cited in Moorcroft, 2007; Michael, 2015). A contrasting example can be found in vocal pedagogy's opposite end. Science-based teaching uses technology through real-time visual feedback, serving as an external focus of attention and providing objective and reliable feedback (Welch *et al.*, 2005).

Artistic function

Composers and performers employ imagery for expressive purposes that extend beyond rational explanations of experience (Schippers, 2006). For singers, an important function of imagery is to communicate with the audience, which relates to character building and role-playing (DeSantis, Deck, Hall, 2021). Additionally, external focus of attention enhances both musical expression and technical skills of musicians, as found by Mornell and Wulf (2019). In line with their findings, Robertson (2025) recommends that singers shift their focus away from technical considerations and instead focus on conveying the expressive content of their performance, engaging with their emotions, and activating their imagination. Noting that self-focus can negatively impact performance, Treinkman (2021) presents a similar yet more nuanced recommendation, encouraging singers and actors to prioritize their character's emotions over their own.

Imagery as mental training

Sport psychology and the performing arts share significant commonalities (Hays and Brown, 2004, cited in DeSantis, Deck and Hall, 2021; Treinkman, 2021). Like athletes, musicians and singers engage in silent practice and mental imagery to enhance or envision successful performances (Moorcroft, 2007; DeSantis, Deck, and Hall, 2021) or to practice when they cannot physically do so, for instance, during travel (Lotze, 2013) or recovery (DeSantis, Deck and Hall, 2021).

Mental training is based on the similarities between imagined movement and executed movement (Brown, 2023), including its duration (Bakker *et al.*, 2008, cited in Lotze, 2013). Research supports the idea that motor execution and imagery share a partial equivalence (Jeannerod, 2001, cited in Lotze, 2013).

However, distinct differences exist between performing arts and sports and cross-disciplinary findings must be carefully evaluated (Treinkman, 2021). While Ericsson *et al.* (1993, cited in Wilson, 2006) regard mental practice as a valuable form of deliberate practice, Lotze (2013) argues that it should only complement musical instrument practice rather than replace it.

Part two: So, what?

Imagery's efficacy in motor skill acquisition and retention

Ragan (2018) has identified efficacy as both crucial within vocal pedagogy and achievable through various methods. Additionally, efficacy plays a crucial role in evaluating pedagogical approaches (Treinkman, 2021). Efficacy and effectiveness are often used interchangeably within the literature. Related but distinct, efficiency is described as “ease of production” (American Academy of Teachers of Singing, 2025, p. 507), serving as an indicator of the efficacy of teaching strategies.

In contrast, self-efficacy is the belief in one's capacities to succeed in learning various skills (Schunk, 2023). It is the most important factor determining successful learning outcomes, surpassing practice, as demonstrated by a significant number of studies (McCormick and McPherson, 2003; McPherson and McCormick, 2006; Ritchie and Williamon, 2012; McPherson and McCormick, 2000, cited in Varela, Abrami and Uptis, 2016).

Motor learning theory considers the retention and transferability of motor learning skills to be key factors in assessing the effectiveness of motor learning. Retention refers to a student's ability to perform a skill effectively after a break in practice, while transferability, or generalization, is the ability to apply a skill in different circumstances (Bergan, 2010; Crocco, McCabe and Madill, 2020; Crocco and Meyer, 2021; Treinkman, 2021).

However, retention and transferability develop over time, with motor learning being a continuous process (Helding, 2008); therefore, immediate results are not reliable indicators of true learning, as they may reflect only temporary improvements (Crocco and Meyer, 2021). Helding (2010) refers to this phenomenon as the “masterclass syndrome”. In her discussion on the role of imagination in vocal pedagogy, Patenaude Yarnell (2003) illustrates it, describing a teaching situation in which a famous soprano successfully used the image of a laugh to help a student master the coloraturas of “Sempre libera” (La Traviata). According to motor learning theory, the effectiveness of imagery in promoting retention of motor learning skills cannot be reliably inferred from this type of experience. Mental rehearsal, on the other hand, has been shown to enhance long-term performance outcomes (Theiler and Lippman, 1995, cited in Lotze, 2013).

Strengths

Metaphorical images, according to Williams and Georges (2016), rely on humans' natural ability to learn effectively through imitation, movement, and storytelling, facilitating the integration of different cognitive domains. These qualities make them particularly suitable as an alternative to longer verbal instructions, as highlighted by several scholars (Lakoff & Johnson, 1980; Ortony, 1975; Schippers, 2006, cited in Brown, 2023). Moreover, the coordination between the mind and body required for complex tasks, such as singing, benefits from imagery's ability to engage brain areas involved in performance and to enhance the speed and efficiency of their responses (Paivio 1971, Kosslyn, Ganis, and Thompson 2001, cited in Brown, 2024). This view, however, is challenged by Giora (2007) and Paivio and Begg (1971, cited in Brown, 2023), who argue that metaphorical images require longer processing times due to their reliance on social and individual context, as well as the need for personal interpretation.

Despite its complexity, imagery remains a powerful teaching strategy. According to Miller (1996, cited in Brown, 2023), the persistence of imagery as a teaching method is due to its ability to enhance the replicability of sensations in students, which would otherwise be more challenging. Voice teachers often employ imagery within personalized instruction as a time-saving and effective method to help students develop learning agency, self-efficacy, and integrate effective performative skills (Brown, 2024). Therefore, while images are usually used to achieve immediate effects (Barten, 1998; Schippers, 2006; Skoog, 2004, cited in Robbearts, 2014), they may also support pedagogical strategies focused on long-term retention of motor skills.

Limitations

While mental imagery has been well documented in sports science, it remains understudied in music pedagogy (Steenstrup *et al.*, 2021). In fact, DeSantis, Deck and Hall (2021) found that few studies have examined imagery's effectiveness for musicians, including singers. In line with this, Lotze (2013) observed a gap in the research on musical imagery in neuroscience. These gaps in the literature may be attributed to musicians' epistemological resistance to scientific inquiry, as music is often perceived as subjective, ineffable, and non-quantifiable (Hossner and Wenderoth, 2007).

Challenges

Besides gaps in the literature, various challenges related to the use of imagery among musicians have been identified, including imagery ability, level of expertise and subjectivity.

Imagery ability

Kinesthetic and visual imagery are crucial components of imagery ability (Hall, 2001; Martin *et al.*, 1999, cited in Fournier, Deremaux, and Bernier, 2008). As defined by Bowes (2009), ability criteria include accuracy, vividness, and the capacity to control and engage with images over time. According to Fournier, Deremaux, and Bernier (2008), the effectiveness of imagery depends partly on an individual's imagery ability, which can weaken the correlation between imagery use and outcomes, especially when athletes are poor imagers. Further supporting the notion of a relationship between imagery ability and efficacy, Isaac (1992) and Ryan and Simons (1982, cited in Bowes, 2009) found that athletes perform at a higher level when they meet specific ability criteria, particularly in terms of vividness and control.

Level of expertise

Imagery tends to be more accessible to experienced singers than to beginners, which may pose challenges in its application during early training. Motor imagery is grounded in the execution of physical movement and is thus acquired through experience, with its use being particularly prevalent among professional musicians (Lotze, 2013). This aligns with Mizuguchi and Kanosue's mapping studies (2017, cited in Ladda, Lebon, and Lotze, 2021), which found that expert performers showed greater brain activation than novices during motor imagery and skill observation.

Since experts have more experience with motor skills and imagery, they use imagery more frequently, which enhances their imagery skills and improves their efficacy, creating a positive feedback loop (Bowes, 2009). Similarly, as noted by Fournier, Deremaux, and Bernier (2008), variations in the use of imagery relate to the level of expertise, with the content of imagery differing between beginners and experts. In line with their findings, Holmes and Collins (2002, cited in Bowes, 2009) support the idea that

imagery gradually adapts based on the level of expertise. Building on this idea, Bowes (2009) hypothesizes that voice students use imagery to develop and automate motor learning skills in the early stages, while experienced singers use imagery to enhance performance rather than to support procedural learning.

Subjectivity

The subjective nature of imagery instruction has contributed to the criticism of imagery (Brown, 2023; 2024; Moorcroft, 2016; Ware, 2013). Singing is a highly subjective, embodied activity that involves intellectual, psychological, and physical aspects (Paparo, 2016). The auditory and somatosensory perceptions involved in singing are personal experiences, grounded in procedural knowledge (American Academy of Teachers of Singing, 2025). This may explain why voice teachers often rely on personal sensations when using imagery instruction, though students may not share the same experiences (Michael, 2015; Miller, 2004, cited in Moorcroft, 2007). If imagery is used without critical examination, it can lead to “standardized strategies” (Brown, 2024, p.6). According to Pecina (2017), applying a one-size-fits-all method is no longer acceptable in modern vocal pedagogy. Similarly, Patenaude Yarnell (2003) warns against such practices and advocates for personalized approaches, citing a masterclass where undifferentiated instruction led to limited success. For example, projecting the voice outward was helpful for some students but counterproductive for others, resulting in more pressed phonation.

Subjectivity can result in uncritical use of imagery and undifferentiated teaching, potentially reinforcing traditional or inaccurate imagery (Brown, 2024). Despite these concerns, some researchers argue that even inaccurate or stock imagery passed down empirically without criticism can still be effective (Lakoff, 1993, cited in Brown, 2023; Michaël, 2011; Williams and Georges, 2016). This view is supported by Moorcroft (2007), who argues that directional imagery, even if physiologically incorrect, should coexist with other types of imagery or declarative instructions. In my teaching, I use the traditional image “*inhalare la voce*” (“inhale the voice”) to direct breath upward and backward. Though anatomically incorrect, it effectively helps regulate airflow and transglottal pressure—a point I clarify with students.

However, researchers in vocal pedagogy widely agree on the need for a critical and reflective approach of imagery based on physiologically accurate images and personalized instruction (Brown, 2023; Chen, 2007; Verdolini, 2000; Miller, 1987, cited in Brown, 2024; Bozeman, 2007; Harrison, 2018; Latukefu and Verenikina, 2011;

Michaël, 2015). Turning individual perceptions into general instructions as if they were evidence-based might indeed create “vocal myths” (Michaël, 2015, p. 5) and cause confusion for students, hindering their progress or affecting their vocal health (Black, 2015; Fabris, 2018; Michael, 2010, cited in Brown, 2024).

Part three: Now what? Implications for vocal pedagogy

After critically evaluating the nature, use, and effectiveness of imagery—including its strengths and limitations as identified in the literature—the following section explores the implications of these findings for voice teachers within an EBVP framework.

Focus of attention

As previously discussed, an external focus of attention benefits motor learning and enhances performance. In fact, the internal focus of attention, defined as directing attention toward bodily mechanics or the execution of physical movement, has been shown to hinder both short-term and long-term skill acquisition (Helding, 2008). In line with this view, Robertson (2025) draws attention to the inhibiting effect of an internal focus of attention, both physically and mentally, which can be counterproductive to expression and self-efficacy. This is supported by Treinkmann (2021), who notes that instructions directing attention on an internal focus can negatively affect performance, even though they may initially appear effective in the practice room.

These negative effects of internal focus of attention can be explained by the constrained action hypothesis (CAH), which states that focusing on internal biomechanics encourages conscious control mechanisms and inhibits automaticity. Conversely, external focus of attention fosters automaticity, improving efficiency and allowing attention to be directed toward other artistic elements of performance, such as expression. In the voice studio, as noted by Stark (1999, cited in Moorcroft, 2007), it may be more effective to encourage students to direct their tone in a particular direction than to adjust their “second-formant resonance” (p. 1). In addition, external focus of attention helps singers avoid self-consciousness and manage performance pressure (Hossner and Wenderoth, 2007; Mornell and Wulf, 2019; Treinkman, 2021). Building on this research, I experimented with it while preparing a trio of high school students for an end-of-the-year audition. I invited them to imagine singing not only to the audience in front of them, but also to those on the sides and in the first balcony. This simple image led to a more vibrant sound, improved blend, and a more moving performance.

Critical approach to imagery

Voice pedagogues need to critically evaluate their use of imagery to ensure that it does not accidentally promote internal focus of attention, whether images arise spontaneously or are deliberately used (DeSantis, Deck, and Hall, 2021). They also need to examine the images they or their students use through the lens of physiological accuracy. Body Mapping, developed by Barbara Conable, an Alexander Technique teacher, is a method that helps musicians develop accurate mental representations of their anatomy and physiology (Connable, 2000). It has been applied by pedagogues such as Bozeman (2017, cited in Brown, 2023) to support healthy and efficient vocal technique. Mapping errors—such as mislocating the back throat wall—can lead to vocal constriction (Williams and George, 2016; Bozeman, 2015). In my experience, this issue is often linked to the use of the yawn image and can be addressed by abandoning this image and remapping the back of the throat to its actual position in front of the ears.

Implications for voice teachers

According to Treinkman (2021), imagery is typically associated with an external focus; however, Franklin (2012) provides a more nuanced view that involves both external and internal images, which co-exist, overlap, or interact. Images can be analyzed based on their location—whether global or specific—and perspective—internal or external—as shown in the diagram below. This model can be used to choose or adapt imagery based on each student's needs.

Table 1: “Where is the image?”, reproduced from Franklin (2012)

IMAGERY’S LOCATION	INTERNAL: IMAGE IS OF SOMETHING INSIDE OF YOUR BODY	EXTERNAL: IMAGE IS OF SOMETHING OUTSIDE OF YOUR BODY
Local: Image is located in one specific place	Imagine your hip joints. Imagine your central axis.	Imagine a tree on a hill. Imagine another person in class with you.
Global: Image is present everywhere	Imagine your entire inner body. Imagine all your	Imagine yourself standing in the falling rain.

	muscles to be flexible and strong.	Imagine yourself surrounded by beautiful flowers.
Movement traveling from inside your body to outside it	From you fingers laser-like beams of light emerge...	And continue outward onto the whole stage you are performing on.
Movement traveling from outside your body to inside it	You feel warm rays moving into your shoulders...	From the hot sun overhead.

The deliberate and critical use of imagery can help voice teachers steer students away from internal focus (Mornell and Wulf, 2019; Treinkman, 2021). They can choose to use external and global images instead of internal and anatomical ones, such as “filling the room with sound” as opposed to focusing on “lifting the soft palate” (Atkins, 2017). This pedagogical strategy aligns well with research from other fields. For instance, a study on how metaphors influence jump height in dancers found that although all images enhanced it, global images were more effective (Heiland, Franklin, and Rovetti, 2010, cited in Franklin, 2012).

Student-led pedagogy, co-construction

Current practice-based research in vocal pedagogy emphasizes the value of student-led pedagogy and co-construction (Brown, 2023; 2024; Crocco, Madill and McCabe, 2017; Fletcher, Davidson and Krause, 2020; Latukefu and Verenikina, 2011; Ragan, 2018; Robertson, 2025), in contrast to the master-apprentice model, an approach that promotes autonomy, motivation, and long-term learning. According to Brown (2023), collaboration between students and teachers, along with scientific accuracy, is especially important for an effective personalized use of imagery. Brown (2024) proposes an adaptation of a coaching technique called “Clean Language Coaching” to voice pedagogy. This approach emphasizes the need to work with students' images in an exploratory manner—away from a top-down approach—and instead promotes personalized, student-centered, co-constructed instruction. In practice, this involves encouraging students to develop their creativity and invent their own images, engaging in a collaborative dialogue with their teachers (Robertson, 2025).

Procedural and declarative knowledge

While a detailed discussion on feedback is beyond the scope of this report, it is important to recognize its vital role in vocal pedagogy, especially in the development of voice students (Welch *et al.*, 2005). Verbal feedback from voice teachers—often referred to as augmented feedback—encourages, by its nature, students to focus on an external target (Helding, 2008). However, voice teachers must carefully consider the content of their feedback, “to inform but not overwhelm the student” (Bozeman, 2007, p. 5). This concern is supported by research in motor learning, which shows that verbal explanations during skill acquisition can impair learning because conscious control disrupts action (Verdolini-Marston and Balota, 1994, cited in Latukefu and Verenikina, 2011). Neuroscience research on memory systems suggests a competition between procedural (know-how) and declarative knowledge (know-that) acquisition. The interference between implicit and explicit teaching may help explain the disruption caused by conscious control (Poldrack *et al.*, 2001; Poldrack and Packard, 2003, cited in Flegal and Anderson, 2008). Understanding this distinction can help voice teachers know when to provide explanations about vocal mechanisms and when to refrain from doing so. In a field-based report from Griffith University, *Singing Teachers Talk Too Much*, Nisbet (2003) explores this issue in depth.

Imagery as implicit instruction/ explicit teaching for beginners

As noted by Treinkman (2021), implicit instruction has been shown to be just as effective as direct instruction in skill acquisition and retention, but it yields superior results during performance under pressure, an important aspect of musicians’ experience. Because performance best demonstrates retention (Treinkman, 2021), this implies that imagery, as part of implicit instruction, is a key element in motor learning retention. However, the relevance of implicit instruction may depend on the student's level of expertise.

Whether voice teachers should use explicit teaching and break down the parts or adopt an implicit instruction style—using a holistic approach involving images, expression, movement, etc.—is often attributed to students' level of expertise, with the assumption that direct instruction is more appropriate for beginners (Bergan, 2010; Brown, 2024; Treinkman, 2021). According to Nisbet (2003), for instance, singers in the learning phase need to develop motor coordination before engaging with expression and interpretation. Brown (2024) aligns her inquiry with the previously discussed findings on imagery use

according to level of expertise (Bowes, 2009; Fournier, Deremaux, and Bernier, 2008; Ladda, Lebon, and Lotze, 2021; Lotze, 2013) and questions whether beginners possess the internal creative resources necessary to turn implicit instruction into motor learning, advocating for sequential, explicit instruction for beginners. Even though Bergan (2010), drawing on research, advocates for whole-task practice—arguing that learning should prepare for performance as an integrated action—she admits that its usefulness may depend on the student’s level of experience, with “errorless” learning being possibly more suitable for beginners. Her preference for whole-task teaching aligns with one of the principles of physical training, ‘specificity’, which holds that practice must coincide with the activity being learned (Nix, 2017).

However, from a practitioner's perspective, Treinkman (2021) disagrees with these views, arguing that task breakdown for beginners leads to blockage. Similarly, Robertson (2025) warns against a mechanistic approach that relies on declarative knowledge and voluntary motor control, as it can lead to an internal focus of attention and vocal entanglement. Instead, he advocates for an approach based on expression, using imagination and emotions as cues, especially for young voices. Those views are supported by research on external focus of attention. Improvements in singing quality among both novices and experts were observed when using a distal target (Atkins and Dukes, 2013; Atkins, 2017), indicating the external target’s effectiveness across various skill levels. Therefore, the level of expertise is not the only factor to consider when choosing between implicit or explicit teaching, but other factors such as the teacher's preferences and the student's learning style should also play a role.

Teaching style

According to Bergan (2010), the teaching style—whether explicit or implicit—depends not only on the student's level of expertise but also on the teacher's. Less experienced voice teachers might favor structure and minimize “errors,” while more advanced educators might be more comfortable with students' exploratory processes and “errors.” As stated by Finlay (2008), implicit teaching aligns with Schön’s reflection-in-action (1983), where experts are more proficient in their practice, whereas novices tend to follow pedagogical methods rigidly.

Blended approach versus multimodal strategy

Voice teachers need to adapt to the level of expertise of their students and their learning styles, adopting a blended approach integrating scientific knowledge and imagery (Brown, 2021; 2023; Keenze and Bell, 2005, cited in Robbearts, 2014; Harrison, 2018; Latukefu and Verenikina, 2011; Welch *et al.*, 2005) or a multimodal approach, using different teaching strategies such as explicit or implicit teaching (Brown, 2021; Flegal and Anderson, 2008; Miller, 2003, cited in Robbearts; Harrison, 2003; Marton, 2007, cited in Latukefu and Verenikina, 2011; Robertson, 2025; Sansom, 2016).

Findings from Latukefu and Verenikina's studies (2011) emphasize the effectiveness of a blended approach that combines imagery and scientific insight to promote self-regulation and agency. However, Sansom (2016) offers a contrasting view, giving preference to multimodal teaching. Based on students' learning styles, he recommends either explicit instruction, using anatomy and physiology, or a constructivist teaching style that incorporates creativity and verbal imagery. Robertson (2025) goes a step further than Sansom and advises voice teachers to be open-minded and avoid overrating one approach over another.

His view is supported by research in neuroscience, which suggests that using different teaching strategies with the same student enhances motor skill retention by activating different areas of the brain (Jacobsen, 2013; Nanay, 2022; Price and Byo, 2002, cited in Brown, 2023). This is consistent with the above discussion on the competition between procedural and declarative knowledge. These findings imply that multimodal teaching, which involves switching between various teaching styles, is more effective than a blended approach that may combine procedural and declarative knowledge without clear boundaries. This idea is supported by Nisbet (2003), who encourages declarative teaching outside of voice lessons during pedagogy classes.

Conclusion

This review supports a multimodal approach, enabling a flexible vocal pedagogy that incorporates a variety of teaching styles, including a blended approach. It emphasizes the importance of an external focus of attention, physiologically accurate imagery, and

student autonomy. While it affirms the pedagogical value of imagery, further research on the use and efficacy of imagery is needed.

If the role of function in determining imagery types and characteristics is confirmed, more studies will be needed to investigate the relationship between imagery variables and efficacy in athletes (Fournier, Deremaux, and Bernier, 2008). Similarly, studies in voice science, defining which types of images are useful for specific purposes, should be encouraged, as there is currently no established codification (Brown, 2023) or framework linking verbal and visual imagery (Williams and Georges, 2016). This perspective is supported by Harrison (2018), who emphasizes the necessity for a systematic approach to using imagery, grounded in physiologically accurate images, as part of an effective teaching toolbox.

These limitations may also appear in vocal pedagogy curricula, though more research is needed on voice teachers' training and skills (Fletcher, Krause and Davison, 2020). According to Bowes (2009), imagery should be part of students' curriculum at the university or conservatory level. Echoing this view, Robertson (2025) considers the development of expression and imagination as part of the teacher's role. Mental training strategies are rarely part of a voice teacher's formal education. These topics, in my opinion, could be more explicitly included in vocal pedagogy.

Considering this identified gap, this reflective review offers insights and practical support for voice teachers who engage with imagery. It proposes that imagery, while valuable, must be used critically and intentionally within a multimodal pedagogy, aligning with motor learning principles and adapting to individual students' needs within EBVP. It enhances voice teachers' ability for critical reflection, offering insights into their self-assessment of imagery use and teaching paradigms, resulting in more effective instruction and improved student learning retention. Advances in neuroscience and motor learning, along with the consensus on collaboration between teachers and scientists (Bozeman, 2007) and with performers (Brown, 2021), suggest that what was seen as a debate between science and imagery is no longer relevant. As Holding (2018, p. 11) writes, "the most rewarding arena for teachers of singing is likely to be found in the dynamic dance between science and art."

Critical reflection

Introduction

In this critical reflection, I draw on Borton's reflective model—what, so what, and now what (1970) — for consistency with the report and for its linear structure. It enables me to explore my growth as a teacher, singer, and researcher, with the idea of change acting as a guiding thread throughout. As Bergan (2010, p.10) suggests, “the artist's willingness to remain open-minded and to truly live out one's days as a ‘life-long learner’ may indeed result in volitional changes in habitual patterns of behavior or vocal pedagogic practices.”

From doubt to inquiry (what-so what)

The rationale for my topic came from questions related to my teaching practice. I wanted to ensure that my teaching methods — whole task teaching, use of movement, and use of imagery — were grounded on a solid conceptual foundation. I aimed to evaluate whether the anatomy and physiology course at Maîtrise de Radio-France supported students' procedural knowledge and remained pedagogically worthwhile. In addition, I had personal concerns that I might be lacking in structure and systematism in my pedagogy (Ragan, 2020) and had experienced “choking under pressure” (Treinkman, 2021; Wulf, 2013), a form of MPA also discussed by Holding (2016). These experiences, questions, and doubts prompted me to investigate the topic of imagery.

While staying focused on my main topic through academic reading, I also engaged with supplementary materials such as Heather Baker's online presentation on gesturing in singing (Vocal Advancement, 2023), and Voice Study Center short course replays, including Jenna Brown's *Science versus Artistry*, and Kenneth Bozeman's *Pedagogic Misconceptions and Their Correction*. These resources made me aware of the growing interest in imagery—alongside expression and gesture (Moss Erickson, 2023; Robertson, 2025)—in the voice teaching community.

Professional development (so what- now what)

These inquiries led to a pivotal moment when I contacted Kenneth Bozeman, who agreed to provide me with lessons and mentoring on pedagogical aspects, including practical acoustics (Bozeman, 2021). His pedagogical integration of voice science with imagery and emotions (Bozeman, 2016) supported my growth as both a singer and teacher. It helped me shift away from micromanaging maneuvers—a common pitfall for voice teachers, according to Flegal and Anderson (2008). In an informal exchange, Bozeman directed me to a forthcoming article by the American Academy of Teachers of Singing (2025). This reference became a key source in shaping my argument for integrating imagery and embodiment into EBVP, especially through the lens of procedural learning. Bozeman's input reinforced my confidence as an emerging researcher, giving me a sense of belonging to a larger academic community. I began to experience research not as something external, but as an ongoing process I was actively part of (Bourke, 2014).

Researcher's identity quest (what-so what-now what)

While I encountered challenges with the previous work-based research, I observed a stronger preference for desk-based inquiry. The combined use of tools like MaxQDA and Mendeley provided a solid foundation for detailed literature analysis, systematic engagement with sources, and conceptual clarification by developing my own codes (see Appendices B and C). The visual coding system allowed me to zoom in on key concepts and compare authors' arguments without having to take notes on each article separately, as I was previously doing in Notion (<https://www.notion.com>), compensating for the time investment in the coding process. Codes based on keywords from articles' abstracts, which were automatically created in MaxQDA when exporting files in RIS format, were helpful in finding references for specific topics. Mendeley, on the other hand, helped to zoom out and contextualize the themes within broader topics (See Appendix D).

I also became more aware of metadiscourse, paying attention in my writing to integral and non-integral citation, attitude and engagement markers, signpost sentences, and hedging (Winter, 2023). I differentiated between "assertion and evidence", selecting verbs, such as 'has been shown', 'was found', to refer to primary research (Baumeister and Leary, 1997, p. 9).

This research strengthened my confidence to disseminate my learning outcomes with actionable contributions. I plan to initiate an online group with some colleagues at Maîtrise de Radio-France to present and discuss practice-based vocal pedagogical issues. As a result of this research, I was also invited by a health insurance company to deliver a short online presentation on procedural learning to healthcare practitioners involved in the prevention of voice disorders among elementary and secondary school teachers. Additionally, the editorial board of the Journal of the AFPC requested that I translate this review into French for publication in fall 2025.

New understanding of imagery (now what)

As Winter (2023) notes, due to the exploratory nature of practitioner research, the topic may evolve during a literature review. This study started with a broad interest in imagery and motor learning retention. As it unfolded, it focused on procedural learning and focus of attention, which led to a shift from blended to multimodal approaches. This review deepened my understanding of imagery's nature, function, and efficacy, while reinforcing my interest in whole-task teaching, which integrates technique and interpretation through tools like imagery, movement, and emotions. It strengthened my belief in a pragmatic approach, incorporating embodiment in EBVP. I plan to continue learning about those topics and to attend online certificate courses at Voice Study Center, including "Acting Approaches for Singing Teachers" and "Coaching Emotional Vocal Expression".

Moreover, I developed awareness of the conditions under which imagery is more effective, that is, when critically applied, especially regarding physiological accuracy, focus of attention, and level of expertise. Eric Franklin's method, which uses anatomically accurate drawings, hand modeling, and props as external focus, aligns with these findings.

This study also supported my belief in pedagogical co-construction and gave me insights into multimodal teaching. When using a blended approach, I will make subtle adjustments, delaying declarative teaching until after the procedural, due to neural competition between the two modes (Flegal and Anderson, 2008). I will, when possible, prefer multimodal teaching, meaning adapting to the style of the student, but also mixing strategies, to vary students' practice, which will benefit their retention of motor skills (Bergan, 2010; Steenstrup *et al.*, 2021). This literature review provided a new perspective on the anatomy and physiology course at Maîtrise de Radio-France, making a strong pedagogical rationale for its continuation.

Conclusion

This review helped me refine my teaching paradigm and provided greater depth and justification to my pedagogical orientations. As reflective practice is the fusion of “personal beliefs and values into a professional identity” (Larrivee, 2000, cited in Finlay, 2008, p.3), I recognize that this reflective narrative review has contributed to building my identity as a voice teacher, singer, and researcher, which will inform my future decisions.

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List of Appendices

- **Appendix A:** MaxQDA – List of codes by frequency
- **Appendix B:** Example of conceptual and lexical clarification
- **Appendix C:** Overview of personal codes containing the word *imagery*
- **Appendix D:** Comparison of MaxQDA and Mendeley – search results for the Word *retention*

MaxQDA – List of codes by frequency

Liste de codes	Fréqu
Liste de codes	3149
commentary	1
Critical reflection	2
reflective practice definition	5
reflective practice	4
metadiscourse	6
practitioner researcher	1
Meta-analysis	1
narrative literature review	5
literature as data	3
imagery instruction	3
Controlled processing	1
reflection	13
skill,	1
ability	1
explicit memory	2
implicit memory	6
holistic task	2
random (variable) practice	1
retention definition	5
attentional capacity	1
qualities of voice teachers	2
motivational qualities of voice teachers	1
imagery ability	2
efficiency	1

thoughts	1
collaborative teaching	2
self-consciousness	2
MPA	9
automaticity	5
creativity	4
singer's identity	1
procedural knowledge	3
declarative knowledge	2
transferability	5
reflective learning	1
aesthetic concept	2
imagined sound	1
verbal behaviour	1
expression	12
metaphor	7
self-critiquing	1
imagination	6
teaching style	4
feedback	3
body mapping	4
literature review types	3
bias	1
crossreferencing	2
Literature review definition	2
VERT	4
reflexivity	4
evidence-based framework	11

methodology	8
gap in literature	6
module 3 thematic	8
experience	20
motor learning	30
metacognition	3
focus of attention	26
deliberate practice	5
self-efficacy	6
self-regulation.	4
practice	5
practice.	1
retention	21
motivation	6
autonomy	4
mis conceptions	7
critical approach	17
scientific validation	1
spontaneous imagery	1
Amount of imagery	2
similarities between sport psy chology and the performing arts	1
mental training approach	8
equivalence between mental rehearsal and physical practice,	7
imagery definition	14
terminology	6
muscle training	3
unconscious coordination	2
somatic approaches	4

embodiment	9
exploration	2
vocal health challenges	1
wellbeing	1
emotions	6
problem of language	10
efficacy	31
cognitive dissonance	1
vocal instrument characteristics	11
interpretations	4
communication	5
subjectivity	12
replicability	2
Role of imagination in phonation	4
stock image	2
inaccurate imagery,	11
personalised imagery	13
physiologically accurate imagery	15
application of imagery	11
function of imagery	45
imagery type	37
imagery characteristics	14
impact of imagery	4
Mirror Neuron System (MNS),	1
intuition	4
positivism	3
pragmatism	4
blended approach	15

master apprentice model	5
student led pedagogy	18
co-construction	9
learning styles	12
multimodal teaching	16
systematic teaching	5
teaching paradigms	13
constructivism	16
direct instruction	16
implicit information	21
ROUGE	740
BLEU	213
JAUNE	23
critique of critics	4
science limitations	3
critics of voice science	8
reductionism	1
imagery criticism	24
cooperation	4
debate	9
consensus	2
RÉFÉRENCES	0
RIS	0
SN_ISSN/ISBN	2
L1_Link to PDF	93
AB_Abstract	58
DO_Name of Database	42
JF_Periodical full name	61

UR_Web/URL	12
Y1_Primary date	90
TY_Type of reference	93
TI_Title	93
A1_Primary author	175
VL_Volume number	58
IS_Issue number	52
SP_Start page number	53
EP_Ending page number	53
PB_Publisher	32
MOTS-CLÉS	0
*Females	2
*Singing	2
*Vocal Music	2
*Womens Studies	2
Acting	1
actor training	1
arts and health	2
attentional focus	2
Audio-motor	2
Auditory imagery	4
Balancing	2
Body schema	2
Brain and mind	2
Brain representation	2
brass pedagogy	2
characteristics and func-tion of mental images	2
Choral Music	2

choral music education	2
Classical singers	2
coaching	2
Cognition	3
conservatory training	1
Content	2
Creativity	2
Cultural diversity	2
deliberate practice	4
DESCRIPTORS *Adolescents	2
Dynamic neuro-cognitive imagery	2
Embodied cognition	2
embodiment	2
embodying singing	2
Emotion	2
ensemble	2
experimental teaching	1
expert voice teacher	2
Expertise	8
Explicit	2
expression	1
Fascia	2
Feldenkrais Method	2
Fine Arts	2
fMRI	4
focus of attention	8
Functional connectivity	2
Functional reorganization	2

Golf putting	2
guided imagery	2
imagery	8
Imagery in Teaching Singing	2
Imagery in Voice	2
Imagery training	2
Imagination	4
Implicit	2
instrumental learning and teaching	2
interleaved/random practice	2
International Phonetic Alphabet (IPA)	1
Knowledge	2
Knowledge of performance	2
Language	2
Learn	3
Literature Reviews	2
master voice teacher	2
measure	2
Mental imagery	3
Mental practice	2
Mental simulation	2
Merleau-Ponty	2
metacognition	2
Metaphor	2
methodology	2
mind-body	2
motor imagery	2
motor learning	10

Motor Learning–Voice–Therapy–Practice	2
motor skill learning	4
Movement	4
Movement imagination	2
Music	4
music learning	1
music performance anxiety	2
music psychology	1
music skills	2
Musicians	2
pedagogy	9
performance	3
Performing	2
phonetic training	1
phonetic transcription	1
phonetics	1
practice	2
practice quality	2
practitioner-research	2
psychology	2
Qualitative research	4
quality	2
questionnaire	2
Representation	2
Scholarship of Teaching and Learning	1
science	2
self-regulation	2
Shusterman	2

Sing	3
Singing	12
singing instruction	2
singing pedagogy	2
singing tone production	4
Singing training	2
singing voice research	2
Soccer	2
solfege	2
somaesthetics	2
speech	1
speech training	1
Teach	3
teaching	6
Teaching strategies	2
trumpet	2
Unconscious	2
varied practice	2
Verbal instruction	2
Vocal Imagery	2
vocal pedagogy	10
voice	14
Voice Disorders	2
voice education	2
Voice production	2
voice science	2
voice teacher training	2
voice terminology	2

voice training	3
World music	2
teacher-performer	3

APPENDIX B

MAXQDA24 Accueil Importer Codes Mémos Variables Analyse Méthodes mixtes Outils de visualisation Rapports MAXDictio

Module 4_backup-20250531-071917 MAXQDA (24.10.0)

Accueil Importer Codes Mémos **Variables** Analyse Méthodes mixtes Outils de visualisation Rapports MAXDictio

Liste des variables Editeur des données pour les variables des documents Importer variables de document Exporter variables des documents Statistique de variables de document

Liste des variables Editeur des données pour les variables des codes Importer variables de code Exporter variables de code Statistique variables de code

Documents

Fletcher, Davidson, Krause - Unknown - Defining the Expert Voice Teacher vocal tract

6 / 13 103%

critical reflection

criteria denoting voice teacher expertise, and the fact that no two studies share the same exact definition of voice teacher expertise. Some definitions relate to teacher-performers as expert voice teachers as they gain their knowledge through performing, experience, and knowledge of the

much consensus in their approaches, specifically regarding physical components of vocal production and perceptions of sound quality or timbre. Further studies of voice teachers conclude that experts demonstrate an ability to address students verbally and non-verbally in the lesson (Dufault, 2008) and

Codes 3149

commentary 1

Critical reflection 2

reflective practice definition 5

reflective practice 4

metadiscourse 6

practitioner researcher 1

Meta-analysis 1

narrative literature review 5

literature as data 3

imagery instruction 3

Controlled processing 1

reflection 13

skill, 1

ability 1

explicit memory 2

Segments sélectionnés

66 segments codés (de 30 documents, 7 groupes de documents)

Mode : Recherche simple

Hyland (1999) examines the difference between integral and nonintegral citation.

Literature reviews serve a scientific field by providing a much-needed bridge between the vast and scattered assortment of articles on a topic and the reader who does not have time or resources to track them down.

the purpose of a literature review is simply to describe a collection of relevant findings, so no integrative theorizing is needed, and the introduction does not have any task except to convince the reader how important and interesting the topic is.

Thus, for literature reviews, the distinction between assertion and evidence is very important.

APPENDIX C

MAXQDA24

Accueil

Importer

Codes

Mémos

Variables

Analyse

Méthodes mixtes

Outils de visualisation

Rapports

MAXDictio

Module 4_backup-20250531-071917

MAXQDA (24.10.0)

Connexion

Liste des variables

Editeur des données pour les variables des documents

Importer variables de document

Exporter variables des documents

Statistique de variables de document

Liste des variables de code

Editeur des données pour les variables des codes

Importer variables de code

Exporter variables de code

Statistique variables de code

Documents

Bowes, 2009 ok An Exploratory ...

Efficacy

Methodology

Methodology 2

Baumeister, Leary - 1997 - Wri...

Bell - 2007 - Doing your Resea...

Burnard - 2006 - Telling half t...

Crocco, Madill, McCabe - 2017...

Finlay - 2008 - Reflecting on '...

Fletcher, Davidson, Krause - U...

0/0

Aa

a*

abc

impact of imagery

in their natural practice and performance environment in order to gain a more complete understanding of imagery use. These researchers suggest that university students too often lack the maturity and understanding that seasoned professionals gain after years of

imagery

Codes

imagery instruction

imagery ability

spontaneous imagery

Amount of imagery

imagery definition

inaccurate imagery

personalised imagery

physiologically accurate imagery

application of imagery

function of imagery

imagery type

imagery characteristics

impact of imagery

Segments sélectionnés

Segments

214 segments codés (de 34 documents, 7 groupes de documents)

Mode : Recherche simple

Bowes, 2009 ok An Exploratory Study of the Use of Imagery by Vocal Professionals

These researchers suggest that university students too often lack the maturity and understanding that seasoned professionals gain after years of meeting the demands of performance requirements. It was also assumed that universities and conservatories of music did not traditionally provide students with psychological skills instruction, including imagery, although this trend seems to be changing (Caldwell13 & Wall, 2001; Connolly, 2002; Connolly & Williamon, 2004; Emmons & Thomas, 1998). Musicians, teachers, and coaches may be unaware of or unfamiliar with the benefits, techniques, and specific applications of imagery as used in sport psychology in athletic or artistic performance. It is possible that professional singers would have a greater understanding and knowledge of incorporating appropriate mental skills, including imagery, after years of meeting the various challenges involved in the highly technical and artistic endeavor of vocal performance.

Athletes with better imagery ability in vividly producing and controlling images were thought to enjoy superior performances (Isaac, 1992; Ryan & Simons, 1982). R

The image shows a screenshot of the Mendeley Desktop application. The window title is "Mendeley Desktop". The top toolbar includes icons for "Add", "Folders", "Sync", and "Help". A search bar on the top right contains the text "retention" and a "Clear" button. The left sidebar, titled "MY LIBRARY", shows a tree view of folders. The "All Documents" folder is selected. The main pane, titled "All Documents", shows search results for "retention". The results are displayed in a list format, with each entry showing a star icon, a document icon, the title, authors, year, journal, and a snippet of the text. The status bar at the bottom indicates "1 of 406 documents selected".

Module 4_backup-20250531-071917

MAXQDA (24.10.0)

AccueilImporterCodesMemosVariablesAnalyseMéthodes mixtesOutils de visualisationRapportsMAXDictio

Liste des variables

Editeur des données pour les variables des documents

Importer variables de document

Exporter variables des documents

Statistique de variables de document

Liste des variables de code

Editeur des données pour les variables des codes

Importer variables de code

Exporter variables de code

Statistique variables de code

Documents3149

Documents

Bowes, 2009 ok An Exploratory St...

10

Efficacy

0

Methodology

49

Methodology 2

241

retention articles

119

Harrison - 2003 - Who am I At...

7

Motor learning principles an...

41

Crocco, Meyer - 2021 - MINDF...

2

Crocco, McCabe, Madill - 2020...

14

Codes3149

retention definition

5

retention

21

Motor learning principles and voice pedagogy theory and practice - 2010 - Bergan.pdf

vocal tract

2 / 14

100%

retention

principles can or should be attempted in the voice studio.

"LEARNING" DEFINED

It is often the case that the practice of a skill, whether motor or perceptual, is equated with the learning of it. However, true learning as defined in the cognitive and motor learning domains requires both long-term retention and generalization of the skill. Long-term retention is the ability to perform at or near the same accuracy level attained during the acquisition (training) stage; generalization is the ability of that individual to transfer or carry over what has been trained into new but similar tasks.

One example of this would be if a tennis player learned to better coordinate all muscles involved for a forward swing through extended training on that movement. and the backhand swina also improved substantially even though no

Segments sélectionnés

26 segments codés (de 14 documents, 4 groupes de documents)

retention articles > Motor learning principles and voice pedagogy theory and practice - 2010 - Bergan.pdf

However, true learning as defined in the cognitive and motor learning domains requires both long-term retention and generalization of the skill. Long-term retention is the ability to perform at or near the same accuracy level attained during the acquisition (training) stage; generalization is the ability of that individual to transfer or carry over what has been trained into new but similar tasks.

However, in retention tests, those receiving random practice significantly outperformed those who had received blocked practice

Results revealed that spacing provides a review that improves long-term retention, and mixing (randomizing different types of problems) improves student's ability to pair a problem with the appropriate concept or procedure.

Corbeil