NEW TEKS HEALTH STANDARDS: AWARENESS, PERCEIVED KNOWLEDGE, AND PERCEIVED COMPETENCY AMONG CHORAL MUSIC EDUCATORS IN TEXAS

Gideon C. Burrows, B.M., M.Ed., M.M.

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APPROVED:

Allen R. Hightower, Major Professor
Stephen F. Austin, Committee Member
Jessica Nápoles, Committee Member
Andrew Trachsel, Chair of the Division of Conducting and Ensembles
Jaymee Haefner, Director of Graduate Studies in the College of Music
John W. Richmond, Dean of the College of Music
Victor Prybutok, Dean of the Toulouse Graduate School

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In this study, I examined the awareness, perceptions of required knowledge, and perceived competency of Texas secondary choral music educators concerning the new musician health objectives included in the revised Texas Essential Knowledge and Skills standards (TEKS). A secondary purpose of this study was to identify the activities and variables that promote the development of these characteristics and prepare educators to address the standards in their instruction. Using a researcher-designed web-based survey instrument, I gathered data from participants who were actively teaching choir in secondary public schools in the state of Texas (*N* = 183). As part of the survey, participants reported the highest degree they had attained and field of study, the completion of choral methods and vocal pedagogy courses during their training, participation in professional development, and years of teaching experience. Findings revealed that a majority of participants (53.01%) were not aware of the health-related standards prior to taking the survey. A majority also did not consider each objective as required curricular components (hydration: 69.95%, vocal health: 39.89%, body mechanics: 61.75%, hearing protection: 68.85%, hygienic practice: 69.96%). Participants did rate themselves highly for perceived competency, a measure including adherence to competent practices and views of personal ability. There were no statistically significant main effects observed for any variable on awareness and perceptions of knowledge. I did observe significant main effects of degree level and major, professional development participation, and completion of a choral methods course for measures of perceived competency.

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CHAPTER 1

INTRODUCTION

Background of the Study

In April 2013, the Texas Education Agency (TEA) added new requirements to the Texas Essential Knowledge and Skills (TEKS) standards. These standards, presented as learning objectives, were designed to ensure that student musicians learned about health and wellness concepts associated with musical performance and practice. These additions to the state standards introduced new requirements that directed all music educators to "facilitate exploration, understanding, analysis, and application of knowledge regarding health and wellness concepts … such as body mechanics, hearing protection, vocal health, hydration, and appropriate hygienic practice."[1] This state mandate represents the first time that changes to address concerns regarding musician- and performance-related health issues were implemented at the secondary level in the United States.[2] Additionally, it further extends the trend of attempts to address musician health originally set in national accreditation standards for collegiate schools of music.[3] TEA required changes in instruction and curriculum design by the 2015-2016 school year to incorporate these new standards.

Despite the adoption of the revised standards and mandate, no inquiry has been made by the state representatives or academic researchers to ascertain whether these changes have been incorporated into music classrooms or if adapted instruction aids students in meeting

[1] Kris Chesky and Sajid Surve, "Health & Wellness in the Music TEKS," *Southwestern Musician* (May 2016): 51.

[2] Ibid.

[3] Ibid.

these new expectations. While it is likely that individual teachers are attempting to provide adapted instruction, the existence and efficacy of such methods have yet to be documented. In order for students to achieve the established benchmarks, they need to receive adequate and supportive instruction. Lacking a framework for delivery, capable and qualified educators should establish a model of best practices. Secondary music educators act as the primary link for "establishing [the] social and cultural values and beliefs" that influence music students and help them to avoid performance-related injuries.[4] If these vital figures lack awareness, knowledge, or competency regarding these health factors, the effort to aid our students through the revised standards becomes meaningless and impotent.

The experiences of Lauren Lestage illustrate the need for the kind of support and instruction mandated by these standards. In the fall of 2016, Lestage shared her history of vocal health and injury at the Health in Music Education Symposium hosted by the Texas Center for Performing Arts Health at the University of North Texas (UNT). Lestage was a vocal music major recovering from voice surgery, requiring months of vocal rest. Her presentation highlighted the personal and emotional toll of performance-related health issues. Furthermore, her account demonstrated that the lack of recognition or assistance from her music educators caused nearly irreparable harm.

Lestage began her presentation by sharing that she had wanted to pursue a singing career as early as the seventh grade. Her parents arranged for voice lessons in pursuit of this

[4] Kris S. Chesky, William J. Dawson and Ralph Manchester, "Health Promotion in Schools of Music: Initial Recommendations for Schools of Music," *Medical Problems of Performing Artists* 21, no. 3 (2006): 142-44, accessed November 25, 2016, http://www.sciandmed.com/mppa/journalviewer.aspx?issue=1168&article=1673&action=3#abstract.

goal. It was in these lessons that the word "raspy" was first used to describe her voice.[5] She did not believe that this was cause for any concern since her instructor did not try to correct or further address this characteristic.[6]

> Well, I can't help but wonder looking back why my voice teacher never worked with me through that raspiness, whether it was because she believed my vocal folds hadn't fully developed yet, or perhaps just because she really didn't know what it meant, or how to help me. Regardless, the issue was never really addressed, so the word 'raspy' continued to be associated with my voice, even into high school.[7]

As she progressed, she began to worry about vocal fatigue in addition to the quality of her singing voice. During several of her weekly lessons, she encountered instances where she simply had "no voice."[8] With each occurrence, her instructor would tell her that she was "fine," and continue with their lesson. Though the philosophy was not instigated by her teachers, Lestage and her classmates adopted the phrase "sing through the pain," pushing each other to perform at their very best.[9]

In high school, she was selected to join the Texas All-State Mixed Choir, an achievement she considered the highpoint of her singing career. However, she experienced frustration and disappointment upon losing the use of her voice after the first day. Lestage did not understand why this happened, as she appeared to be doing the same things as the other singers around her. The feelings of shame she harbored led her to hide this experience from others, including

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[5] Lauren Lestage and Stephen Austin, "Health in Music Education Symposium 2016 – Vocal Health: Lauren Lestage and Dr. Stephen Austin," filmed [November 2016], YouTube video, 21:45, Posted [November 2016], https://youtu.be/KFGUbEwvI84?list=PLIOhhpzDeVLq_ABJSPxUt4Jve3gM0AHP-.

[6] Ibid.

[7] Ibid.

[8] Ibid.

[9] Ibid.

her teachers. In order to avoid any embarrassment, she quietly endured vocal fatigue-related issues through the rest of her high school career.[10]

Vocal fatigue became a central focus once Lestage arrived at the University of North Texas. Her sophomore voice teacher did not like the raspy quality of her voice. This teacher was concerned about Lestage's inability to produce a clear tone and suggested that she have her voice examined by a doctor. The examination revealed nodules on her vocal folds, and she was referred to a voice therapist. Though she hoped that the therapy would help her correct the habits that contributed to her vocal trauma, fatigue-related symptoms returned and further inhibited her ability to speak and sing. A subsequent laryngoscopic examination found evidence of acid reflux and revealed that one of the nodules had developed into a polyp. She consequently underwent a successful voice surgery and, fortunately, was able to continue her music studies. Lestage must continually make conscious choices to preserve her vocal health in order to prevent a return of any issues.

> Although I am standing here today, and I am a year after my surgery, and I am fully recovered, I still make active decisions every day to make sure that my nodules and polyp don't come back. Things such as sleeping at a slant at night to treat my acid reflux, things like attempting to get eight hours of sleep every single night, and things like giving up caffeine. I feel so proud to say that I know all of these new ways to take care of my voice, and to me that knowledge is completely priceless.[11]

In reflecting on Lestage's journey, UNT voice professor Stephen Austin shared with the symposium attendees that, "Our voices are our primary means of letting the world know who we are" and that the voice "allows us to participate in humanity."[12] He continued that voice

[10] Lestage and Austin, "Health in Music Education Symposium 2016 – Vocal Health."

[11] Ibid.

[12] Ibid.

problems are commonplace among student voice majors, noting that such health issues often interfere with their studies and cause them to miss rehearsals or postpone juried performances. Such a high demand on their time and their voices contributes to health problems.

Dr. Austin ended his presentation noting that "the good news is that staying vocally healthy is primarily behavioral."[13] He asserted that there are things choir directors can do to help students recognize possible problems and guide them toward appropriate resources or care. He also lamented that such an approach "isn't a part of our standard course of education, and it should be."[14] In her dissertation regarding promoting vocal health in the adolescent singing voice, Rianne Gebhardt surmised that:

> The goal of a teacher of singing is not to try to eliminate all the vocal misuse in the world, but to educate and guide his/her students to use their instrument in a healthy manner. However, young people, even when informed, will abuse their voices. They will attend sporting events and concerts and sleepovers, etc. This informed student, however, learns to self-monitor, and begins to take notice of their vocal limits and is also dissuaded by their teacher from employing destructive vocal behaviors. If a young person does not comprehend a consequence for a behavior, what then prevents them from partaking in said behavior?[15]

The ability of students to develop the competencies outlined in the revised TEKS depends upon the guidance they receive during their formal education. In order for students to implement healthy behaviors in their musical practice, their teachers should directly address the related concepts and skills in their curriculum and instruction. Rehearsals and classroom activities

[13] Lestage and Austin, "Health in Music Education Symposium 2016 – Vocal Health."

[14] Ibid.

[15] Rianne Gebhardt, "The Adolescent Singing Voice in the 21t Century: Vocal Health and Pedagogy Promoting Vocal Health," (doctoral dissertation, Ohio State University, 2016), 49.

should support and nurture the development of appropriate and healthy performance practice.

Statement of the Problem

Because this topic is new to the discipline of music education, professionals teaching secondary choral music may not be aware, knowledgeable, or competent to meet the demands presented by the 2013 addition of the musician health concepts to the TEKS.[16] The health and safety standards that form part of the National Association of Schools of Music (NASM) accreditation process were only added in 2012.[17] Therefore, undergraduate teacher programs may have yet to fully adapt and may not currently prepare teachers to meet these challenges. Additionally, at the onset of this research, there were no continuing education or outreach programs designed to increase awareness and competency among Texas choral music educators. Recently, the Texas Center for Performing Arts Health at UNT has started developing discussions, workshops, and resources to aid fine arts educators in navigating musician health and the revised TEKS objectives.[18] Though welcome news, these offerings have received limited outreach and recognition. This observation supports the possibility that current teachers may not have sufficient assistance to help them implement these new standards. Furthermore, no known research studies report the extent to which teachers are aware of this mandate, or

[16] Chesky and Surve, 52

[17] Amy Laursen and Kris Chesky, "Addressing the NASM Health and Safety Standard through Curricular Changes in a Brass Methods Course," *Medical Problems of Performing Artists* 29, no. 3 (2014): 136-37; "Basic Information on Neuromusculoskeletal and Vocal Health: Information and Recommendations for Faculty and Staff in Schools of Music," National Association of Schools of Music, Performing Arts Medicine Association, II-7, accessed September 23, 2017, https://nasm.arts-accredit.org/wp-content/uploads/sites/2/2016/02/2_NASM_PAMA_NMH-Faculty_and_Staff_June-2014.pdf

[18] "NNLM-Funded TCPAH/DISD Project 2019-2021," Texas Center for Performing Arts Health, accessed March 23, 2021, https://tcpah.unt.edu/nnlm-funded-tcpahdisd-project-2019-2021; "Performing Arts Health," National Library of Medicine, accessed March 23, 2021, https://nnlm.gov/scr/initiatives/performingartshealth.

whether they possess the knowledge or ability to meet these standards.

Significance of the Study

No known studies address teacher awareness, knowledge, or competency concerning the musician health standards that secondary choral music educators in Texas are legally obligated to include in their instruction. Chesky and Surve highlighted the need to study musician health, especially as it correlates to the new TEKS objectives.[19] Due to the dearth of previous research on this topic, it remains to be seen whether or not students are successfully gaining the knowledge, understanding, and skills associated with the revised TEKS objectives. We likewise do not know what resources educators require in order to include these concepts in their instruction. As the first state to pass such instructional standards on health objectives, Texas has the opportunity to influence secondary music instruction in the entire nation. Measuring educator awareness, knowledge, and perceived competency is the first step toward ensuring that this influence is positive and effective.

Recognizing that "many of the physical, psychological, and sociological determinants for performance injuries are well established before young musicians attend college," the National Association of Schools of Music (NASM) adapted its national standards for accredited music programs in 2012.[20] In effect, these changes instructed music programs to adapt their curricula so that they may prepare "health-conscious music educators" and "produce injury-free musicians."[21] In revising the state educational standards, the State of Texas extended this goal

[19] Chesky and Surve, 51.

[20] Chesky, Dawson and Manchester, 142-44.

[21] Ibid.

by sharing it directly with public school educators. Based on the evaluation of the data, the implications from this research may inform modifications to teacher preparation programs and professional development offerings as well as continued research in this field.

Purpose of the Study

The purpose of this study is to assess educator awareness, perceptions of required knowledge (perceived knowledge), and perceived competency as related to the musician health objectives outlined in the revised TEKS. In order for students to develop the musician-health competencies, their teachers must be aware of them, possess the knowledge associated with them, and have the sufficient competency to build student understanding and skill in these areas. Additionally, through this study, I sought to identify factors that specifically promote or inhibit educator awareness, perceived knowledge, and perceived competency. According to the data gleaned from the study, training programs and continuing education initiatives could be developed and targeted in response to specific deficits. Therefore, the purpose of this study is to assess the extent to which educators are prepared to meet these new challenges.

Definition of Terms

- *Awareness*: The knowledge or perception of the revised state standards for music instruction.
- *Perceived competency*: A self-assessment of ability; the educator's own measurement of their ability to aid students in gaining the skills and understanding required of the new the musician health components in the state standards for instruction.
- *Perceived knowledge*: Maintaining the facts, information, and details regarding the

new musician health concepts in the revised state standards; the extent to which an educator perceives the new standards and its individual components as mandated competencies.

- *TEKS (Texas Essential Knowledge and Skills):* The standards for primary and secondary public instruction in the State of Texas, as set by the State Board of Education; a collection of competencies (understanding and skills) students are expected to achieve through participation in a grade or course.

Research Questions

The main goal of this study was to analyze and assess the preparedness of secondary choral music educators in Texas to meet the new challenges presented by the revised TEKS. Successful preparation would empower educators to address the new musician health components in their classroom instruction. The specific questions that informed this analysis included:

1. Are secondary choral educators aware of the revised musician health mandate and its components?
2. Do secondary choral educators properly perceive the revised TEKS components as required curricular knowledge?
3. How do secondary choral educators perceive their own competency to successfully teach this material and incorporate it into their instruction?
4. What variables favorably support and promote teacher awareness, perceived knowledge, and perceived competency with respect to the musician-health components of the revised TEKS?

Research Assumptions

For this study, I perceived that secondary choral educators were not aware of their responsibility to "facilitate exploration, understanding, analysis, and application of knowledge

regarding health and wellness concepts related to musical practice, such as body mechanics, hearing protection, vocal health, hydration, and appropriate hygienic practice."[22] Even though the study of the state standards typically occurs within the teacher preparation curriculum, certification programs have had little time to adapt within the constraints of their scheduling and resources. As such, new teachers may have increased awareness of the revised TEKS when compared to more experienced teachers but lack the knowledge to address each component of the musician health mandate. Likewise, experienced educators may lack professional development opportunities to become knowledgeable about the revised TEKS. Finally, despite the lack of awareness and training, choral educators may perceive themselves as sufficiently competent to address the revised mandate and believe that their traditional instruction aids their students in becoming proficient in these areas.

Summary

The current standards for music instruction in Texas (known as the TEKS), require secondary music students to gain understanding and associated skill in the following areas as they relate to musical practice and performance: body mechanics, hearing protection, vocal health, hydration, and appropriate hygienic practice. Changes made in the accreditation requirements of schools of music, coupled with the recent implementation of the revised TEKS, suggest the possibility that secondary choral music educators lack sufficient preparation and knowledge to include these new concepts in their instruction and classroom activities. Additionally, many practicing educators may remain unaware that the TEKS were revised to

[22] Chesky and Surve, 51.

incorporate musician health and wellness concepts and have made no changes in their curriculum to address these standards. Lacking any measure or evidence to indicate compliance, this study was designed to ascertain the degree to which secondary choral music educators (a) are aware of the revised TEKS, (b) perceive the musician health components as required curricular knowledge, and (c) are perceivably competent to implement effective instruction that includes and addresses the new standards. Through the use of an online survey, participants representing choral educators across Texas responded to prompts that assessed awareness, perceived knowledge, and perceived competency.

CHAPTER 2

SURVEY OF LITERATURE

In the State of Texas, secondary choral music educators are legally obligated to include musician health standards in their instruction as outlined in the 2013 revision of the TEKS. However, no known studies have addressed teacher awareness, knowledge, or competency concerning this mandate. Despite a lack of research on the TEKS, researchers in other fields have thoroughly studied related concerns, and their published findings support and inform the current study. The areas of related research include educational standards, teacher training, teaching practices, and adolescent health education and health-related behavior. In the absence of direct data, the findings and discussions from these various studies provide relevant insight into the effective implementation of these new mandates. As such, the following review is interdisciplinary. The findings have been grouped into the following categories: musician health standards in teacher training, manifesting health issues in adolescent singers, when school hinders progress, adapting classroom delivery, teacher preparation and pedagogical development, state standards in the classroom, and professional development.

Musician Health Standards in Teacher Training

Due to its relatively recent development, the requirement for music educators to address musician-health related concepts introduces new challenges for teacher training. In May 2016, Chesky and Surve sought to increase educator awareness concerning these standards by writing an article for the *Southwestern Musician*, a periodical published by the Texas Music Educators Association (TMEA). During their discussion of the new TEKS objectives, Chesky and Surve highlighted the severe lack of data concerning music-related health issues

and advocated for new research.[23] They explained that the TEKS musician heath objectives were added to ensure that "the next generation of musicians [would] possess [the] knowledge and tools needed to make informed decisions about their occupational health and to make optimal use of health resources."[24] As such, the revisions further "expand and redefine what it means to be a music educator as well as an educated musician."[25] For students to meet the objectives, therefore, their teachers must appropriately understand and address music-related health and wellness concepts.[26] However, requiring music educators to address such issues does not automatically provide educators the awareness or ability to do so. As such, the success of this standard relies upon the training of secondary music teachers.

As referenced in the previous chapter, NASM introduced additions to its accreditation standards mandating that teachers receive training in music-related health issues. To maintain accreditation, institutions of higher education must prepare "health-conscious music educators" whose training would produce "injury-free musicians."[27] In their research of music curricula following the establishment of this new requirement, Laursen and Chesky observed that "student awareness, knowledge and the perception of competency and responsibility for addressing health risks associated with learning and performing musical instruments" were heavily influenced by how each institution implemented the new standards.[28] They also found

[23] Chesky and Surve, 51.

[24] Ibid.

[25] Ibid.

[26] Ibid.

[27] Chesky, Dawson and Manchester, 142-44.

[28] Laursen and Chesky, 136.

that "musicians' health [remained] an underrepresented topic in music method courses."[29] This finding further suggested that "future music educators are … generally unaware of the health and safety issues associated with learning to play a musical instrument."[30] The concern about a deficiency in choral methods courses may be empirically justified. Data from Texas' own teacher certification exam has identified vocal pedagogy as one of the topics examinees most frequently miss.[31] Choir teachers in other studies (presented later in this chapter) have also identified "health-related issues" as a high area of interest and need.[32] These combined findings suggest that choral music educators may not be sufficiently aware, knowledgeable, or competent to address some of the health-related aspects of the TEKS.

Other observations support the possibility that teacher preparation programs inadequately support musician health training. Laursen and Chesky noted that their "research did not report any examples of methods courses that included either occupational health content or related course objectives."[33] They further observed that the "development and implementation of health education into the school of music curriculum is challenging due to several factors."[34] These factors include "limited training among music faculty, full and often inflexible degree plans, and scheduling conflicts."[35] Following the results of their study, they

[29] Laursen and Chesky, 140.

[30] Ibid.

[31] "TExES Practice Exam," Texas Music Educators Association, accessed August 19, 2017, https://www.tmea.org/divisions-regions/college/texes-review/practice-exam#PreparationReview.

[32] Chelcy Bowles, "The Self-Expressed Professional Development Needs of Music Educators," *Update: Applications of Research in Music Education* 21, no. 2 (2002): 37.

[33] Laursen and Chesky, 167.

[34] Ibid., 136.

[35] Ibid.

suggested that programs "may need to modify undergraduate courses to help prepare undergraduate students to meet these legal obligations."[36] Following that logic, professional development opportunities may need to implement similar modifications in order to train music educators who have already graduated and are currently teaching in the state.

In a separate study, Chesky, Dawson and Manchester noted that "performance injuries are preventable."[37] As such, they asserted that "schools of music should focus on Prevention Education in addition to supporting efforts directed at treating diseases once they have occurred."[38] Such a holistic approach should emphasize the role of personal responsibility in preventing performance-related injuries.[39] As an example of this need, they recognized that noise-induced hearing loss, a condition experienced by many musicians, was "a widespread and serious public health issue that … receive[d] little or no recognition in schools of music."[40] They further advocated that such prevention education needed to "go beyond merely 'delivering' instruction or 'disseminating' information" and "address issues that affect music students' values, beliefs, and motivations."[41]

Manifesting Health Issues in Adolescent Singers

Students enrolled in secondary music classes demonstrate the need to adapt teacher training to address musician health. Certified choir directors may not be sufficiently prepared to

[36] Chesky and Surve, 51.

[37] Chesky, Dawson and Manchester, 142.

[38] Ibid.

[39] Ibid.

[40] Ibid., 143.

[41] Ibid., 142.

incorporate the revised TEKS mandates to protect the vocal health of adolescent singers. Various studies support the notion that adolescent singers are ill-equipped to use their individual voices in healthy ways. Becker illustrated that the widespread use of modern media influences and distorts general perceptions of vocal use in theater students. Modern media "[caters] to the untrained ears of a younger, perhaps less sensitive audience" through heavy dependence upon electronic amplification and manipulation.[42] Becker observed:

> Audiences exposed to the new commercial sound, whether instrumental or vocal, are being "programmed" to expect similar auditory experiences elsewhere. And so in their relentless quest to enhance [the] box office, Broadway producers are casting pop stars from television shows, in which the performer's singing (and the expectation of that singing) must already be quite different from standard live-sung sound. …the use of sound-editing software would seem inevitable. For example, "auto-tune," a downloadable studio trick, where sung material can instantly be nudged onto the proper note or moved to the correct pitch, has found its way into sung theatre performance. Almost like airbrushing, this phenomenon has totally computerized and altered audience perception of the human voice. [43]

Beyond the professional stage, this phenomenon is replicated throughout other forms of media. The singing on many popular television shows and audio recordings "relies far too much on post-production editing, as well as pitch manipulation," and similarly affects how performers "use their own voices and bodies while singing."[44] With this altered perception, students may lack a sufficient understanding or standard by which to assess their own health as it relates to singing and other musical activities in a live acoustical setting.

Coupled with this media bombardment, additional literature suggests that young singers

[42] David Becker, "A Midsummer Night's Dream on the Radio: Technology in Voice and Speech" (doctoral dissertation, Virginia Commonwealth University, 2010), 23.

[43] Ibid., 25.

[44] Ibid., 26.

may lack the ability to recognize and address vocal issues. Eadie et al. found that the ability to judge voice quality is not dependent upon any single factor or standard. Both experienced and inexperienced listeners demonstrated an inability to identify possible vocal impairment in provided voice samples. Eadie et al. shared, "Differences among listeners with varied experience levels might be expected because experience is one factor by which listeners develop internal templates for various voice qualities."[45] Based on this claim, one can surmise that students' choral experiences will influence how they judge their vocal production and future progress—for good or for ill. In addition to this finding, the study also demonstrated that most participants lacked a common framework, and evaluated their voices and related maladies far differently than trained and experienced listeners or professionals.[46]

However, the findings of Lee, Drinnan, and Carding seemingly contradict this view. They asserted that:

> … naïve listeners, with no formal pathological voice exposure, judge according to standards suited to normal voices. Therefore their perceptual strategies will be similar because all listeners have extensive experience with normal voices. It is therefore reasonable to suggest that voice patients, without auditory preconceptions, may reliably rate their own voices.[47]

However, as their study involved the speaking voice, Lee et al. recognized that this observation may not directly relate to vocal use in singing. Preconceptions and experience with healthy singing may not be normalized. Young singers may lack the experience to allow them to

[45] Tanya Eadie, Mara Kapsner, Juli Rosenzqeig, Patricia Waugh, Allen Hillel and Albert Merati, "The Role of Experience on Judgments of Dysphonia," *Journal of Voice* 24, no. 5 (2010): 565.

[46] Ibid.

[47] Mei Lee, M. Drinnan and P. Carding, "The Reliability and Validity of Patient Self-rating of Their Own Voice Quality," *Clinical Otolaryngology* 30, no. 4 (August 2005): 357-58.

accurately rate their own voices. As Lee, Drinnan, and Carding further stated, "It is unlikely that voice patients have internal templates of disordered voices beyond their own."[48] If the basis for establishing normalcy is dependent upon an individual's voice, then it stands to reason that, lacking a consistent framework, a wide range of discrepancies would exist between individuals when judging voice quality and the possible manifestation of acoustical or physical abnormalities.

Merrill, Gray, and Smith further support the conclusion that young singers lack the ability to maintain their own health in musical practice. They found that many college students had already experienced or were experiencing a voice disorder during their studies. The students they recruited for this first-of-its-kind, large-scale epidemiological investigation were generally in good health. However, 29% of their participants disclosed that they had previous history of a voice disorder when "their voice did not work, perform, or sound as they felt it normally should, so that it interfered with their communication," a finding congruent with previous research.[49] Merrill and his associates also shared that college students tend to experience voice disorders more frequently than similar-aged peers, "but less frequently than same-age individuals employed in vocally demanding professions," such as teachers.[50] Due to influences upon this specific participant pool, their findings may represent an underreporting of activities such as drinking alcohol and smoking, which would increase risk of compromised

[48] Mei Lee, M. Drinnan and P. Carding, 358.

[49] Ray Merrill, Kristine Tanner, Joseph Merrill, Matthew McCord, Melissa Beardsley and Brittanie Steele, "Voice Symptoms and Voice-Related Quality of Life in College Students," *Annals of Otology, Rhinology & Laryngology* 122, no. 8 (2013): 515; Nelson Roy, Ray M. Merill, Steven D. Gray and Elaine M. Smith, "Voice Disorders in the General Population: Prevalence, Risk Factors, and Occupational Impact," *The Laryngoscope* 115, no. 11 (2005): 1989-1990.

[50] Merrill et al., 516.

health.[51] Despite this limitation, they affirmed that "heightened levels of stress and lack of sleep due to study, finances, employment, homesickness, illness, roommates, [and] choosing a course of study" may further challenge the vocal health and quality of life among college students.[52]

Even college-aged students with accomplished musical skill manifest voice-related health issues. Lundy et al. analyzed undergraduate singers in order to build risk profiles that would help better identify and treat singers before they developed serious voice-related health issues.[53] For their study, they recruited first- and second-year music students attending the University of Miami who did not feel that they had any vocal difficulties or other issues related to their vocal health. The participants represented a variety of majors and included students studying vocal performance, contemporary or commercial voice, music education, and choral conducting, as well as some who had yet to declare a music specialty. The researchers catalogued the participants' allergies; intake of possible "drying substances" such as caffeine, alcohol, and mega doses of vitamin C; family and personal medical histories; and acid reflux. They then evaluated students with a rhinolaryngeal stroboscope to determine the physiological health and condition of their vocal folds.[54]

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[51] Merrill et al., 518; Participants often underreport unhealthy or adverse activities due to fears of judgment from researchers and peers. In this instance, the participant pool included students attending religious institutions with robust codes of conduct. These students may actually represent a lower participation rate in adverse health behaviors, or underreport participation due to social stigma.

[52] Ibid., 511.

[53] Donna Lundy, Roy Casiano, Paula Sullivan, Soham Roy, Jun Xue and Joseph Evans, "Incidence of abnormal laryngeal findings in asymptomatic singing students," *Otolaryngology-Head and Neck Surgery* 121, no. 1 (1999):69-77.

[54] A rhinolaryngeal stroboscope is a medical instrument used by an otolaryngologist (ears, nose and throat specialist) to examine the health and function of the larynx. The device contains a light and camera affixed to a

Lundy and her team found that more than half of the supposedly asymptomatic participants actually exhibited indicators of compromised vocal health. Of the sixty-five participants, 52.6% showed signs of erythema on the posterior portion of the fold, while 29% displayed signs of edema.[55] A majority of individuals had glottic gaps, with 45% showing a posterior gap with a closed glottis and 6.2% showing an hourglass configuration of the vocal folds.[56] Only nine participants (15.8%) displayed full glottal closure. The researchers observed a segmentally reduced mucosal wave in 38% of their participants, 6.2% with bilateral lesions, and one participant with a unilateral cyst. They also recorded a high frequency of vocal risk factors that included eating late at night (56.1%), needing antacids (26.3%), consuming alcohol (63.2%), having a worse voice in the morning (50.9%), constant throat clearing (36.8%), stress (50.9%), drastic weight change (63.2%), and vocalizing at part-time work (12.3%).[57]

A comparison of Lundy's findings with "an age-matched group of nonsinging [*sic*] major college students is not available."[58] However, other research demonstrates that similar risk behaviors, such as the use of drying substances, are related to the increased frequency of reported voice disorders among the general population and among teachers of singing.[59] Voice

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flexible cable. In an examination, the camera is inserted through the nostril and moved down behind the velum. A strobe setting on the light allows the physician to observe the movement of the vocal folds.

[55] Erythema is a reddening of the skin usually resulting from an injury or other form of irritation. Edema is swelling caused by excess fluid trapped in the cavities or tissues of the body.

[56] "A minimal posterior chink is considered by most authors to be a normal variant and, for the purposes of this study, was considered to be a variation of a normal closure pattern" (Lundy et al., 72). Therefore, the glottic gaps identified in the results were not indicative of the chinks characteristic of physiological development.

[57] Lundy et al., 71-72.

[58] Ibid., 73.

[59] Roy et al., 1994; Marcie Kurth Miller and Katherine Verdolini, "Frequency and Risk Factors for Voice Problems in Teachers of Singing and Control Subjects," *Journal of Voice* 9, no. 4 (1995): 349.

disorders occur in 29.9% of the general population.[60] However, when broken down into smaller subsets, voice disorders became more prevalent with increasing education (those with a college degree reported a greater frequency of disorder than those with some college, who reported a higher frequency than those with only a high school education, who reported a higher frequency than those with less than a high school education).[61] Miller and Verdolini reported that even teachers of singing "acknowledged a similar rate of current voice problems" as their control participants.[62] However, teachers of singing reported voice problems almost twice as often as Miller and Verdolini's control; they attributed this result to increased awareness, training, and concern for proper function among voice teachers and not to an increased prevalence of voice disorders.[63] Despite the lack of direct comparison, all published data indicate that young students will continue to experience voice disorders and make choices that risk their vocal health.

Adolescence represents the ideal time to instill beneficial behavioral patterns so that individuals avoid such health-related problems. Gebhardt advocated for additional research into adolescent training due to the "The Reminiscence Bump."[64] This bump marks adolescence as a time of learning and memory construction that affects life through adulthood. Since this age is the "time during which lifelong values are formed," adolescence is the ideal time to

[60] Roy et al., 1989-1990.

[61] Ibid., 1989.

[62] Miller and Verdolini, 351.

[63] Ibid., 351-52.

[64] Gebhardt, 1.

address health habits in all activities, especially in music participation.[65] Gebhardt identified these habits as: proper hydration, eating balanced meals, getting adequate sleep, learning efficient vocal production, avoiding unhealthy production, and balancing voice use with vocal rest.[66] Echoing the concerns posed by Becker, Gebhardt noted that popular culture is providing fewer and fewer healthy vocal models to emulate during these crucial ages, while exposure to unhealthy models has dramatically increased, tempting "young singers to push the boundaries of their own physical capabilities to sound like those they admire."[67] Rather than protect them, parents and other community members tend to exploit their abilities instead of using this time to establish proper health habits that will serve them through adulthood.

Though adolescence is recognized as the prime age to develop health-related knowledge and habits, studies show that adolescent singers lack understanding and adequate instruction. Freer related that "narrative studies about boys and singing suggest that boys understand neither the physiological process of voice change nor the phonational [*sic*] and musical effects of the changes."[68] Sweet's *Choral Journal* article reflects a similar impression:

> Adolescent singers often have little or no understanding of how their voice functions; it is a mystery akin to Ariel's glowing orb voice in *The Little Mermaid.* And complicating the matter, unfortunately, is the lack of understanding that many choral teachers have about the physiological function of the voice.[69]

Students must gain an understanding of physiological function if they are to "persevere"

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[65] Julie Kirchhubel, "Adolescent Music Development and the Influence of Pre-Tertiary Specialized Music Training" (doctoral dissertation, Griffith University, 2002), 56.

[66] Gebhardt, 2.

[67] Ibid.

[68] Patrick Freer, "Perspectives of European Boys about their voice change and school choral singing: developing the possible selves of adolescent male singers," *British Journal of Music Education* 32, no. 1 (2015): 88.

[69] Bridget Sweet, "Teaching Adolescents with a Holistic Perspective," *Choral Journal* 57, no. 3 (2016): 10.

through the voice change and enjoy singing into adulthood.[70]

When School Hinders Progress

As much as public schools may serve a central function in helping students develop knowledge and skill, they can also serve as agents that inadvertently hinder student progress. Jamison identified choral school activities as sources of vocal fatigue in adolescent singers. He observed that, in many instances, students lack the technical mastery required for the tasks in which they are asked to participate, often engaging with inappropriate repertoire selections and demanding tessituras. In such situations, students may sing too loudly or softly, maintain speech quality on high pitches (not modify vowels), overexert themselves in and out of singing activities, and perform with unrealistic expectations.[71] He noted that much of the curriculum is not divided into age categories appropriate for each stage of physical development.[72] Many music classes involve singers of mixed abilities and experiences. Combining students at various stages of development creates a possibly frustrating environment wherein students struggle in applying classroom instruction. In contrast, athletic programs often separate teams and classes to avoid possible injury and activities inappropriate for a given stage of physical development.

Jamison also affirmed that adolescents struggle with adapting to the developing voice. Incorrect perceptions and adjustments often result in vocal fatigue. In lieu of employing proper technique in practice, adolescent singers often seek to "satisfy technical demands with *no*

[70] Sweet, 10.

[71] Ward Jamison, "Some Practical Consideration When Evaluating the Exceptional Adolescent Singing Voice," *Language, Speech, and Hearing Services in Schools* 27, no. 3 (1996): 294-298.

[72] Ibid., 292.

technical framework."[73] Singers never genuinely hear their audio product due to sound induction through bone and tissue. As such, they must rely on physical sensations associated with appropriate phonation. These sensations are often established across time through external monitoring (usually by a choral educator or voice instructor) and practice. Without experience to counterbalance the effect, teenagers are more susceptible to the bombarding influence of electronically-manipulated recordings in the popular media. Jamison noted that this influence can lead to students straining and developing vocally compromising habits as they attempt to recreate this type of sound, ignorant of the changes in feedback produced by the performance environment and of the distortion caused by their bodies.

Jamison also accused the classroom teacher—the principal voice instructor for most students—of instigating vocal fatigue by promoting unrealistic expectations of the adolescent singers at their individual stages of development.[74] Students may engage in unhealthy habits and overexert their voices to produce a desired product. Many times, faulty technique results from attempts to follow instructions given for a specific aesthetic or acoustic product. This practice instills not only bad habits in phonatory onset and vocal production, but further distorts a singer's self-perception and ability to appropriately self-monitor technique. The educator often exacerbates this issue by choosing repertoire that exceeds singers' ability to control pitch range, register transitions, phrases, or tone color. Furthermore, singers who are assigned a strict voice classification, such as Tenor 1 or Alto 2, may not have the freedom to focus on technique. The demands of the pitches and tessitura of the assigned literature may

[73] Jamison, 293.

[74] Ibid., 297-298.

inhibit them from focusing on healthy vocal development.

One of the most intriguing findings comes from the work of Daugherty, Manternach, and Price in analyzing adolescent voice use through the course of an All-State event—a program organized and run by music teachers to celebrate exceptional musical skill. Utilizing observations, recordings, participant surveys, and ambulatory phonation monitors, they discovered that students' perceived vocal health declined across the three-day event.[75] Though great maladies were not necessarily manifest in the trend, the most significant decline was found in singers experiencing a "tired voice," while the least decline occurred with "throat clearing" and "airiness/breathiness." The guest conductor's remarks regarding perceived strain or tiredness also increased as the event progressed. Students slept less and less each day. In the end, a majority of students (78.8%) believed that they were able to "take good care" of their voices, while 13.6% thought that they had not. However, as indicated by the use of comments such as "I'm the best" or "singing voice never poor," they noted that some students may not have necessarily understood proper vocal care or held other "physiological misunderstandings."[76] As such, they may have experienced health problems and were either not aware of them or did not admit their occurrence (a "performer delusion").[77]

The data collected from the two students who wore the ambulatory phonation monitors showed that they phonated just as much during non-rehearsal times as during the actual rehearsals. Surprisingly, they encountered their most intense and highest frequency voice use

[75] James Daugherty, Jeremy Manternach and Kathy Price, "Student Voice Use and Vocal Health During an All-State Chorus Event" *Journal of Research in Music Education* 58, no. 4 (2011): 346-67.

[76] Ibid., 362.

[77] Ibid., 362.

in non-rehearsal activities. The scheduled dance required the most vocal demand out of all All-State activities, particularly for the male student. Following a review of the rehearsal recordings with the conductor or clinician, the authors noted that the amount of time dedicated to vocal rest actually exceeded those requiring student phonation. Data also showed that the initial sectional rehearsals, held at the onset of the event under the direction of area educators, were more vocally demanding than the combined sessions with the guest conductor or clinician. Additionally, the researchers observed that the students tended to sit more than stand, and that students sat close together. This configuration most likely affected proper phonation and posture, and contributed to over-singing and vocal fatigue.[78]

Adapting Classroom Delivery

Other research findings provide insight into the educational activities linked to protecting student health and building health-related understanding and skill. As presented below, such activities include providing times for vocal rest in rehearsal and adapting instruction to allow for student engagement, discussion, and participation. Additionally, classroom instruction should recognize and address social and cultural influences on student health decisions. Finally, instruction should provide repeated and continuing opportunities to build music-related health knowledge and skills.

Vocal Rest

Titze, Švec, and Popolo surmised that "Frequent recovery times are needed during

[78]Daugherty,Manternach and Price, 348.

vocalization."[79] According to their findings, "one hour of continuous phonation (which fortunately is impossible because of respiratory demands) would not be sustainable without risk of injury."[80] Additionally, they found that the folds are least affected in monotone speech, with collisions between the folds increasing through normal and exaggerated use. As the folds travel greater distances, the fundamental frequency and sound pressure level also increase, resulting in a greater dissipation of energy and loss of efficiency.

According to their data, a safe, continuous talking limit would be reached at 17 minutes of phonation, with exaggerated speech or inflection shortening that time. Voice rest—pauses that come with speech (since humans do not continually phonate)—was found to extend the safe time limit to about 35 minutes. These pauses, though very short, may provide enough time for the folds to recover, further extending any phonation time limit before damage would occur. The researchers also recognized that, as the structure of the folds is different from that of the hands (the basis of comparison for their study), the vocal tissue may better withstand the type of collisions or vibrations that occur during phonation. However, the data demonstrate the need for rest to preserve health and allow folds to recover. This finding would imply that students in the typical choral rehearsal would likewise need adequate vocal rest cycles in order to avoid injury, especially as singing may require more constant phonation when compared to speaking. The increased amount of phonation within a rehearsal or larger festival would also lead to a greater need for vocal rest to preserve health.

[79] Ingo Titze, Jan G. Švec and Peter S. Popolo, "Vocal Dose Measures: Quantifying Accumulated Vibration Exposure in Vocal Fold Tissues," *Journal of Speech, Language, and Hearing Research* 46, no. 4 (2003): 922.

[80] Ibid.

Health Literacy and Critical Pedagogy

In addition to providing times for rest within a rehearsal, music educators should incorporate opportunities to directly build health-related understanding and skill. For students to develop literacy (the act of building a body of knowledge), they must gain the ability to apply health skills throughout their lives.[81] Health literacy is essential to music education in that it "influence[s] personal autonomy over lifestyle choices" and can "empower individuals to participate in decision-making processes."[82] However, though it may be tempting to merely develop a few presentations to specifically address the TEKS health mandate, literacy is not the sole element in influencing behavior.

Chrondahl and Karlsson noted that health literacy alone is ineffective in changing health-related behavior. Its lack of success partially results from the fact that that it ignores the "social, cultural and economic conditions in the lives of the people and/or their communities."[83] Identifying one such condition, Nordheim et al. found that the media and related product marketing campaigns heavily influence adolescents' reception of health information and "place demands on children's and adolescents' health literacy."[84] However, many "traditional approaches to adult health education have little or no connection with the

[81] Emee Vida Estacio, "Health Literacy and Community Empowerment: It Is More Than Just Reading, Writing and Counting," *Journal of Health Psychology* 18, no. 8 (2013): 1056.

[82] Ibid., 1056-57.

[83] Kristine Crondahl and Leena Eklund Karlsson, "The Nexus Between Health Literacy and Empowerment: A Scoping Review," *SAGE Open* 6, no. 2 (2016): 4.

[84] Lene V. Nordheim, Malene W. Gundersen, Birgitte Espehaug, Øystein Guttersrud and Signe Flottorp. "Effects of School-Based Educational Interventions for Enhancing Adolescents Abilities in Critical Appraisal of Health Claims: A Systematic Review," *PLoS ONE* 11, no. 8. (2016): 2, accessed September 13, 2017, http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0161485&type=printable.

learners' real-life circumstances and experiences," and thus fail to make any lasting impact.[85] As such, merely presenting information as required by NASM does not allow for the exploration, understanding, analysis, and application of knowledge required by the TEKS. Educational activities that address these new objectives, then, must move toward more effective methods beyond mere dissemination.

Many studies, particularly in the field of health education, advocate for a different type of instruction that seeks to incorporate literacy into application. Nordheim et al. found that these more effective methods utilized "active or dialogic approaches rather than more traditional or authoritative approaches to instruction."[86] This instruction often took the form of "small-group work and investigations, worksheets, and teacher-guided discussions." [87] A "predominant feature throughout … was [the use of] authentic problem solving to engage students in the learning process."[88] They found that these "constructivist-teaching approaches" and mentored discussions "were particularly effective in promoting critical thinking regardless of education level."[89] Even in the realm of mathematics education, Baumert et al. asserted that proper pedagogy requires "cognitively activating tasks."[90] Such tasks "draw on students' prior knowledge by challenging their beliefs," and prompt in-class discussion where "a teacher does not simply declare students' answers to be 'right' or 'wrong' but encourages students to

[85] Estacio, 1057.

[86] Nordheim et al., 7.

[87] Ibid.

[88] Ibid., 7-8.

[89] Ibid., 3.

[90] Jürgen Baumert, Mareike Kunter, Werner Blum, Martin Brunner, Thamar Voss, Alexander Jordan, Uta Klusmann, Stefan Krauss, Michael Neubrand and Yi-Miau Tsai, "Teachers' Mathematical Knowledge, Cognitive Activation in the Classroom and Student Progress," *American Educational Research Journal* 47, no. 1 (2010): 145.

evaluate the validity of their solutions for themselves or to try out multiple solution paths." [91]

The implementation of critical pedagogy (the term for this approach) was first advocated by Paulo Freire, a Brazilian educator and philosopher, and has since been heavily researched as a means to positively influence health behaviors.[92] "In his book, *The Pedagogy of the Oppressed*, Freire (1972) critiqued the 'banking' concept of education where he argued how traditional approaches in education dehumanize students to become passive receivers of knowledge."[93] In fact, critical pedagogy moves toward a process that requires students to become the instigators of their own change, engaging in discussions, and sharing social and cultural experiences in a safe environment.[94]

Matthews noted that learning best occurs in an open environment that does not avoid conflicts and strong emotions.[95] This environment requires a teacher to anticipate and know how to work with conflicts. Matthews additionally found that this approach had a strong influence on minority populations, among whom health education traditionally had a minimal effect.[96] Though more effective, researchers also noted that this approach "represent[s] a teaching and learning style that differs from the traditional, authoritative approach familiar to many teachers and students." [97]

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[91] Baumert et al.

[92] Estacio, 1058-1065; Catherine Mathews, "Critical Pedagogy in Health Education," *Health Education Journal* 73, no. 5 (2014): 600-609; Eric Southgate and Peter Aggleton, "Peer Education: From Enduring Problematics to Pedagogical Potential," *Health Education Journal* 76, no. 1 (2017): 6-9.

[93] Estacio, 1058.

[94] Ibid.; Mathews, 600-609.

[95] Matthews, 605-06.

[96] Ibid., 603.

[97] Nordheim et al., 16.

Suggestions to address health concepts through conversation have also arisen from music education literature. Sweet advocated an approach much in line with critical pedagogy:

> Dialogue about vocal function and voice change should be a regular occurrence in adolescent choral classes, not a one-and-done conversation. …. Adolescence is also a prime time to begin conversations about vocal health and phonotrauma, which is replacing the term "abuse and misuse" of the voice (and implies that singers are always to blame for vocal difficulties). …. Discussions with adolescent choral students can promote awareness of non-voiced forms of phototrauma [*sic*] (e.g., non-prescriptive drug use, alcohol, smoking, tobacco, hydration, diet/nutrition, gastro esophageal [*sic*] reflux disease, allergies, sleep deprivation, coughing and throat clearing) and voiced forms (e.g., vocal load and vocal technique).[98]

Kirchhubel additionally observed that for "individuals [to] attain high musical standards, continued development relies on ongoing stimulation."[99] Though her study strictly focused on musical skill, it should be no stretch to surmise that similar, continuous stimulation would be required for students to master the body of musician health knowledge encompassed by the revised TEKS. Kirchhubel also identified the critical role that social interaction plays in cognitive and musical development. She noted:

> … a supportive music-learning environment enhances the development of innate musical tendencies so they may be realised [*sic*] over time. Positive outcomes are dependent upon a philosophy that empowers students and encourages their self-awareness so that they learn how to gain control over their learning, how to motivate themselves, and how to adopt successful learning strategies to improve effectiveness and efficiency.[100]

Classroom activities concerning musician health topics "should comprise enjoyable experiences, reflect a discovery-based approach, be based on modeling and imitation, situated in a practical

[98] Sweet, 10.

[99] Kirchhubel, 1; The word "phototrauma" appears in the original publication and has been retained in the quote. However, I believe that the author meant "phonotrauma," the term used earlier in the same quote.

[100] Ibid., 40.

music-making context, and emphasise [*sic*] cognitive thought processes," as would be needed for the acquisition of other, traditionally-recognized musical skills.[101]

Need for School Intervention

Public schools have an active role in building health-related knowledge and skills in musical practice. Nordheim et al. asserted that "schools are essential for fostering [critical appraisal] skills, given their relevance for students' present and future lives."[102] This position places a significant responsibility on the schools and teachers to instigate health education and change.[103] However, many institutional health claims and practices, though they may appear scientifically sound, are often "based on preliminary or poorly designed and executed studies."[104] As such, schools attempting to address health-related issues may adopt impotent instruction or exacerbate unhealthy behaviors.

Nordheim et al. also found that educators may not have sufficient scientific understanding to make health judgments.[105] One particular study they reviewed "suggested that teachers may need at least a year of consistent practice to feel sufficiently prepared to teach new contents and skills to their students."[106] Thus, even after receiving adequate instruction, teachers "need careful guidance to ensure successful implementation in

[101] Kirchhubel, 40.

[102] Nordheim et al., 2.

[103] Ibid.

[104] Ibid.

[105] Ibid., 16.

[106] Ibid., 19.

classrooms."[107] The findings support the notion that the absence of specific training and mentored development leaves secondary choral music educators unprepared and lacking the means to address the new TEKS musician health standards.

Teacher Preparation and Pedagogical Development

Research demonstrates that music educators make meaningful attempts (with varying degrees of success) to include new standards in their instruction. In fact, they often shirk other responsibilities in order to support their students.[108] However, the following research findings also suggest that educators lack the ability to adequately incorporate the revised standards into their classroom and rehearsal activities. For example, educators may lack the ability to model healthy voice use, possess insufficient pedagogical knowledge or the ability to apply knowledge, lack sufficient resources, or lack adequate professional development opportunities.

Demands of Teaching on Proper Voice Use

Several studies indicate that teachers may guide their students from a compromised stance due to their own lack of skill or understanding. Merrill et al. found that "approximately 42% of teachers ages 20-29 years have a history of voice disorder, compared with approximately 23% of non-teachers in the same age category."[109] They also noted that "Occupational voice users are known to be at greater lifetime risk of voice disorders."[110] Duffy

[107] Nordheim et al., 19.

[108] Rebecca Lindley, "Effective Secondary Choral Teacher Behaviors: A Survey of Oklahoma Secondary Choral Directors," (doctoral dissertation, University of Oklahoma, 2003), 70.

[109] Merrill et al., 516.

[110] Ibid.

and Hazlett found that "Teaching requires vocal endurance, often in stressful conditions, where there is an expectation of optimal voice quality, and in environments that encourage ineffective voice use."[111] As such, educators may need training to address proper phonation and to help them avoid "habitually negative vocal behavior" in their daily activities.[112]

Educator Attitudes and Understanding of Physiological Development

Freer found that the inability of teachers to address the male voice and voice change is one of the substantial reasons for a drop off in adolescent male choral participation. He shared that "many teachers either avoid differentiating instruction or are unsure of how to best meet the vocal and related psychological needs of these boys."[113]

> The influence of teachers extended beyond pedagogy to their behaviors and attitudes toward boys. Eighty-eight percent of boys indicated that the gender of the teacher did not matter. But, a teacher's handling of boys with changing voices was important. Younger boys watched to see how older boys were treated, and then made decisions about their interest in singing.[114]

Concerning adolescent vocal development, he also concluded that:

> Boys who knew that the voice change was a gradual, identifiable process were less likely to draw negative conclusions about their vocal quality than boys who lacked basic knowledge. All boys who reported having received information about the process of voice change stated that they did so from male teachers.[115]

Interviews with participants who withdrew from choral participation yielded many statements about teachers not knowing what to do when a boy experienced a significant voice

[111] Orla Duffy and Diane Hazlett, "The impact of Preventative Voice Care Programs for Training Teachers: A Longitudinal Study," *Journal of Voice* 18, no. 1 (2004): 63.

[112] Ibid., 64.

[113] Freer, 88.

[114] Ibid., 94.

[115] Ibid.

change. One young man from England shared that:

> If boys were taught to use their voice instead just saying "get louder, sing higher, get quieter, do this, do that," it would help a lot. Most boys who quit choir were never taught how to do that stuff and they'll probably never sing again. Sometimes it's like the performance is more important than the person.[116]

None of the boys who withdrew could remember having a vocal model who was a male, and several felt that teachers chose music that did not fit their ranges.[117] Indeed, many aspects of the students' perceived success and continued choral participation appeared to rest with the teacher. Regarding the many factors that contribute to this success, Freer stated:

> The first is the teacher, specifically the teacher's personality and interest in adolescent males, the employment of appropriate pedagogical techniques for boys with changing voices, and an educational philosophy that compels the instruction of young men across all phases of vocal and identity development. The second factor is the predominance of high levels of musicianship on the part of the teachers and in the singing experiences of the boys.[118]

The findings were consistent across the cultures, nationalities, and languages represented in the study.[119]

Voice Instructors and Modeling

Many accomplished secondary choral students also partake in voice lessons. Secondary music programs in Texas often provide these opportunities. Among musicians-turned-teachers, Haddon observed that their previous learning and teaching experiences significantly affect personal teaching methods and ability. Many musicians "often begin to teach with little support

[116] Duffy and Hazlett, 95.

[117] Ibid., 96, 98.

[118] Ibid., 103.

[119] Ibid.

from significant others, and can have a very partial understanding of how to teach effectively."[120] Though undergraduate music education students are typically well supported in their pedagogical development, ineffective teaching methods may manifest to a greater degree in areas where emergency or alternative-certification endeavors have been implemented to fill vacant teaching positions, or where private instructors provide a majority of vocal instruction. Lacking formal pedagogical training, some students' voice teachers may act more from a teaching tradition and instinct formed by their own experiences than from a solid pedagogical foundation.[121] This approach leads to "teaching habits based on subconscious transference of behaviors and methods from their former teachers."[122] She did also note that "students with more teaching experience were better at assessing the individual learning styles of their pupils and tailoring lessons to suit their needs."[123]

Haddon also found that more effective teachers used modeling as a means to help students gain understanding and improved ability. One of the study participants shared:

> I've had a few teachers on different instruments and the ones who play a lot, you can relate to them much more than those who just talk and tell you what to do. Those who play it show it, and that's always a bit of inspiration.[124]

Haddon also observed that, in addition to modeling desired behavior, effective teachers also instructed their students in deliberate practice. Sadly, 70% of the students surveyed in another

[120] Elizabeth Haddon, "Instrumental and Vocal Teaching: How Do Music Students Learn to Teach?" *British Journal of Music Education* 26, no. 1 (2009): 57.

[121] Ibid., 59-60.

[122] Ibid., 60.

[123] Ibid., 62.

[124] Ibid.

study stated that their previous teachers had not given any advice on effective practice.[125] This led Haddon to share that, regardless of the "ability level of the teacher, an important aim should be to enable the pupil to practice efficiently."[126] Furthermore, the teachers who best enabled their students to practice efficiently were themselves experienced performers, and suggests that teachers should be engaged in the same behaviors they hope for their students to adopt.[127]

Training New Skills

Concerning the general qualifications required to teach at the collegiate level, Halpern and Hakel noted that little "formal training addresses topics like adult learning, memory, or transfer of learning."[128] This observation is not likely an accurate depiction of many music education professors, whose teaching experience and work with music education and pedagogy is paramount. However, this description may accurately apply to other areas such as theory and health. They stated:

> But, ironically (and embarrassingly), it would be difficult to design an educational model that is more at odds with the findings of current research about human cognition than the one being used today at most colleges and universities.[129]

Furthermore, concerning the person applying collegiate instruction, they shared:

> We have found precious little evidence that content experts in the learning sciences actually apply the principles they teach in their own classrooms. Like virtually all college

[125] Haddon, 65.

[126] Ibid.

[127] Ibid.

[128] Diane Halpern and Milton Hakel, "Applying the Science of Learning to the University and Beyond: Teaching for Long-Term Retention and Transfer," *Change: The Magazine of Higher Learning* 35, no. 4 (2003): 37.

[129] Ibid., 37-38.

faculty, they teach the way they were taught.[130]

As the TEKS were revised rather recently, educators involved with teacher education programs may have yet to adjust their teaching to help their students address the new mandate. Halpern and Hakel also asserted that, "because their intuitive knowledge of good teaching practices is rarely put to a systematic test, what faculty often 'know' to be sound educational practice may not be so at all."[131]

Teachers need time to practice the application and delivery of new skills and standards. On this topic, Halpern and Hakel stated that "The single most important variable in promoting long-term retention and transfer is 'practice at retrieval.'"[132] As with any applicable skill, educators need to "generate responses, with minimal cues, repeatedly over time with varied applications so that recall becomes fluent and is more likely to occur across different contexts and content domains."[133] Gaining such knowledge and skill must be deliberate, for teachers as well as choral students. These gains do not necessarily occur with the passage of time.

> Experience alone is a poor teacher. There are countless examples that illustrate that what people learn from experience can be systematically wrong. . . .
>
> Confidence is not a reliable indicator of depth or quality of learning. In fact, research in metacognition has shown that most people are poor judges of how well they comprehend a complex topic.[134]

Educators and students need to engage with the concepts beyond lectures in order to develop understanding, critical analysis, and ability. Halpern and Hakel remarked, "Lectures

[130] Halpern and Hakel, 38.

[131] Ibid.

[132] Ibid.

[133] Ibid.

[134] Ibid., 40.

work well for learning assessed with recognition tests, but work badly for understanding."[135] They noted that students can recognize concepts but not recognize their applications, or possess the ability to apply them.[136] Application of knowledge and the act of doing build healthy behaviors over time. "What learners do determines what and how much is learned, how well it will be remembered, and the conditions under which it will be recalled. There is an old saying in psychology, 'The head remembers what it does.'"[137] Choral music educators will remain inefficient at incorporating the new health-related mandates until they have the opportunity to practice and develop effective methods for instruction.

Content Knowledge v. Pedagogical Content Knowledge

Effective educators need knowledge related to the subjects they teach. Kleickmann et al. stated that the field of teacher education has long operated under the assumption that a teacher's own knowledge lies at the core of their competency within the profession.[138] Many studies show that a teacher's knowledge of the content has a positive, correlated effect on student achievement.[139] Metzler and Woessmann found that teacher knowledge is the only factor "consistently associated with growth in student achievement."[140]

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[135] Halpern and Hakel, 40.

[136] Ibid.

[137] Ibid., 41.

[138] Thilo Kleickmann, Dirk Richter, Mareike Kunter, Jürgen Elsner, Michael Besser, Stefan Krauss and Jürgen Baumert, "Teachers' Content Knowledge and Pedagogical Content Knowledge: The Role of Structural Differences in Teacher Education," *Journal of Teacher Education* 64, no. 1 (2013): 91.

[139] Baumert et al., 133-180; Kleickmann et al., 90-91; Heather C. Hill, Brian Rownan and Deborah Loewenberg Ball, "Effects of Teachers' Mathematical Knowledge for Teaching on Student Achievement," *American Educational Research Journal* 42, no. 2 (2005): 371-406.

[140] Johannes Metzler and Ludger Woessman, "The Impact of Teacher Subject Knowledge on Student Achievement: Evidence from Within-Teacher Within-Student Variation," *Journal of Economics* 99, (2012): 487.

However, what we term "teacher knowledge" is actually a combination of content knowledge and pedagogical content knowledge.[141] An educator's content knowledge refers to the "understanding of the subject matter taught."[142] This knowledge remains useless unless an educator can effectively apply and share it with others. "The knowledge needed to make subject matter accessible to students" comprises a separate body of skills collectively known as pedagogical content knowledge.[143] Kleickmann et al. found that content knowledge "remains inert in the classroom unless accompanied by a rich repertoire of … knowledge and skills relating directly to the curriculum, instruction, and to student learning."[144]

Baumert et al. also shared that "Teachers with equivalent levels of subject matter knowledge may differ considerably in their pedagogical repertoire and skills depending on their teaching experience."[145] As Kleickmann et al. reported, content knowledge is a "necessary prerequisite for the development of [pedagogical content knowledge]."[146] However, they also found that "strong [content knowledge] does not necessarily lead to the development of [pedagogical content knowledge]."[147] Both sets of knowledge develop in a variety of settings, including an educator's own experiences as a learner or student, their professional education and continued development, and their own experiences teaching in the classroom.[148] An

[141] Baumert et al., 135.

[142] Kleickmann et al., 91.

[143] Ibid.

[144] Baumert et al., 139.

[145] Ibid.

[146] Kleickmann et al., 92.

[147] Ibid.

[148] Ibid., 91.

educator's learning experience—primarily gained through observing past teachers—is thought to contribute to the informal formation of pedagogical content knowledge. Teacher education programs, by design, provide the opportunity to build content knowledge and pedagogical content knowledge. Formal and informal settings provide growth opportunities throughout a teaching career in the form of workshops and lectures, peer collaboration, and teaching experience.[149]

According to the literature, experience is not correlated with increased content knowledge or pedagogical content knowledge. Researchers studying German math teachers found that years of teaching experience were not associated with scores on a test of their pedagogical content knowledge.[150] Though pedagogical ability could not develop in the absence of content knowledge, Baumert et al. stated that "[pedagogical content knowledge] is needed over and above [content knowledge] to stimulate insightful learning."[151] An additional finding from Kleickmann et al. showed that experienced teachers received the same or even lower content knowledge scores than "student teachers at the end of their teacher education."[152] This result led them to note that content knowledge primarily forms during certification studies

[149] Kleickmann et al., 92.

[150] Martin Brunner, Mareike Kunter, Stefan Krauss, Jürgen Baumert, Werner Blum, Thamar Dubberke, Alexander Jordan, Uta Klusmann, Yi-Miau Tsai and Michael Neubrand, "Welche Zusammenhänge bestehen zwischen dem fachspezifischen Professionswissen von Mathematiklehrkräften und ihrer Ausbildung sowie beruflichen Fortbildung? [How is the content-specific professional knowledge of mathematics teachers related to their teacher education and in-service training?]," *Zeitschrift für Erziehungswissenschaft* 9, no. 4 (December 2006): 521-544, February 15, 2020. http://dx.doi.org/ 10.1007/s11618-006-0166-1, quoted in Thilo Kleickmann, Dirk Richter, Mareike Kunter, Jürgen Elsner, Michael Besser, Stefan Krauss and Jürgen Baumert, "Teachers' Content Knowledge and Pedagogical Content Knowledge: The Role of Structural Differences in Teacher Education," *Journal of Teacher Education* 64, no. 1 (2013): 92.

[151] Baumert et al., 145.

[152] Kleickmann et al., 99.

and not during the inservice portion of an educator's career.[153] An educator's content knowledge also appeared to be "highly dependent on the type of training program they had attended."[154]

The results also showed that a teacher's own learning experiences and initial formal instruction "play an important role in the development of [pedagogical content knowledge]."[155] Kleickmann et al. noted that certified educators made only weak gains to the "development of [pedagogical content knowledge] after initial teacher education."[156] Klieckmann et al. summarized these findings below (with "CK" substituted for "content knowledge" and "PCK" for "pedagogical content knowledge"):

> A further central hypothesis was that formal and nonformal learning opportunities (Werquin, 2010) are especially conducive to the development of CK and PCK, and that teaching experience alone is insufficient. … Furthermore, the inservice phase, which involves primarily informal learning, does not seem to foster the development of CK and PCK as strongly as the formal and nonformal learning opportunities provided by initial teacher education programs. In line with research on effective professional development, our results suggest that participation in traditional formal professional development during the inservice phase fosters the development of CK and PCK weakly, at best.[157]

These findings appear to support earlier research suggesting that "prospective teachers' professional knowledge and beliefs are significantly shaped by their own school experiences," much more than they are by professional development opportunities or teaching experience.[158]

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[153] Kleickmann et al., 99.

[154] Baumert et al., 155.

[155] Kleickmann et al., 99.

[156] Ibid., 100.

[157] Ibid.

[158] Ibid., 91.

Likewise, they appear to indicate that inservice professional development may remain insufficient to build the new content knowledge and pedagogical content knowledge required by the revised TEKS. Though the state may mandate new standards, these actions will have little result without implementing means for teachers to add to their own knowledge and abilities.

Kunter et al. found that "profession-specific knowledge" acts "as a key factor in teacher success" and competency.[159] This type of knowledge is "acquired in formal, profession-specific learning environments and refined in discourse with other experts."[160] Their findings suggest that competent educators seek out "professional development courses or self-initiated learning activities" that contribute to their knowledge growth.[161] Subsequently, they share this knowledge by employing a "'constructivist view' that endorses the principles of active and constructive learning in a social context."[162] These teachers display increased pedagogical knowledge as they tend to "provide better learning support and select more demanding tasks, resulting in better student learning outcomes."[163] Kunter et al. found that this increased pedagogical content knowledge positively affects students' motivation and enjoyment of the subject as well as their achievement and development.[164]

Students appear to gain content-specific knowledge and skill proportional to their

[159] Mareike Kunter, Uta Klusmann, Jürgen Baumert, Dirk Richter, Thamar Voss and Axinja Hachfeld, "Professional Competence of Teachers: Effects on Instructional Quality and Student Development," *Journal of Educational Psychology* 105, no. 3 (2013): 806.

[160] Ibid.

[161] Ibid.

[162] Ibid., 807.

[163] Ibid.

[164] Ibid., 815.

educators' knowledge and competency. Metzler and Woessman determined that this relationship is not "present when high-performing students are taught by low-performing teachers." [165] Interestingly, they also noted that female students did not demonstrate the same magnitude of achievement gains when taught by a male teacher. As such, they noted that "the effect of teacher subject knowledge may depend on the subject [and] the ability and gender match between teachers and students."[166] For teachers to effectively help students meet the standards regarding musician health, they need to not only gain the content-relevant knowledge but also discover and effectively implement teaching strategies that will lead to student success in their individual circumstances and settings.

State Standards in the Classroom

Few studies address how educators implement state or national standards in the music classroom or in the choral rehearsal. Despite the work of teacher education and professional development programs, students may yet lack the educational opportunities that promote understanding, knowledge, and applicable skills. External demands often take a large portion of educators' attention and time. These demands leave little room for adherence to any but the critical standards administrators include in formal evaluations.

Educators view their ability to connect with their students as an indicator of their effectiveness. As such, the extent to which standards are incorporated in classroom instruction appears to depend on how relevant an educator views them to their curricular priorities. For

[165] Metzler and Woessman, 494.

[166] Ibid., 494-95.

example, Lindley found that teacher personality was not a significant contributor to student learning. Rather, an effective teacher is one "whose leadership style matches the demands of the group."[167] This may be the reason for additional findings that "may indicate that choral music teachers place greater value upon interacting with students rather than administrative duties."[168] This interest in student interaction may also signal a lack of implementation of the standards, especially if teachers deem them as administrative rather than student-related duties.

Despite some promising initial data, Orman's research ultimately supports the view that teachers may disregard standards. Initially, her results showed high rates of educator awareness and adoption concerning music standards:

> Survey results from 273 postsecondary school awarding baccalaureate degrees in music teacher education indicated that 98% of the general music methods professors were aware of the National Standards for Music Education. Over 90% of respondents said that they included the national standards as a topic in music education methods classes, and 90% believed that music education students should be prepared to teach the national standards.[169]

We could easily assume that these high rates would indicate a promising outcome for the implementation of new musician health standards. However, participant responses also indicated that teachers did not adequately address the standards, despite their awareness and preparation.[170]

As part of her study, Orman recorded classroom activities and surveyed educators

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[167] Lindley, 4.

[168] Ibid., 70.

[169] Evelyn K. Orman, "Comparison of the National Standards for Music Education and Elementary Music Specialists' Use of Class Time," *Journal of Research in Music Education* 50, no. 2 (2002): 156.

[170] Ibid., 162-63.

regarding those activities. She "found that teachers consistently overestimated the amount of time they perceive spending on these various activities."[171] For example, "ninety-eight percent of the teachers … perceived that singing occurred more often than the videotapes indicated."[172] Additionally, the standard of building "understanding relationships between music, the other arts, and disciplines outside the arts," was "almost completely lacking in [the] first- and second-grade music classes" she observed for the study.[173] Teachers may incorrectly perceive that their instruction and classroom activities align with the state standards. These findings are troublesome, especially when compared with similar studies. Data from a 1999 survey of music fourth-grade specialists led researchers to surmise that teachers did not feel that they had enough time to teach any of the standards effectively.[174]

Orman indicated that teachers may adapt and implement new standards and bodies of knowledge. She observed that elementary music specialists "altered their instruction based upon knowledge they received through professional development and enrichment activities," even in instances when the participant "began teaching before the national standards were written and published."[175] She also noted the possibility that "the national standards have always been and continue to be an active part of their teaching" regardless of when they were initially certified.[176] Many of the choral educators currently teaching in Texas received their

[171] Orman, 157.

[172] Ibid.

[173] Ibid., 161.

[174] Ibid., 156.

[175] Ibid., 162.

[176] Ibid.

training and certifications long before the TEKS revisions and mandated implementation. However Orman's observations indicate that these educators may effectively alter instruction when given appropriate direction through targeted professional development and enrichment activities. It is also possible that, for many teachers, the TEKS continually inform their planning and teaching.

Professional Development

As most current choral educators already have their certifications, training concerning the musician health components of the TEKS will likely occur through professional development and other inservice opportunities. While all teachers engage in continuing education for recertification, participation in continued development does not necessarily increase their awareness, knowledge, or competency. The literature suggests that the delivery and implementation of professional development in the United States requires reform.

Kleickmann et al. discovered that inservice teachers only experienced weak gains in their knowledge scores, and noted a need for more effective professional development. They wrote:

> Research indicates that the success of professional development programs depends on their meeting several criteria: effective professional development that affected teacher learning, instruction, and student progress consisted of long-term and coherent programs that involved teachers in active learning, and that had a clear focus on content and student learning. In Germany, as well as the United States, professional development in mathematics and in other domains often fails to meet these criteria. Consequently, effective professional development, as suggested by research on professional development, is not broadly implemented yet.[177]

The common one-and-done approach does not promote active learning, which requires a long-

[177] Kleickmann et al., 100.

term plan. Educators with higher content knowledge scores may search out more opportunities to address their own weaknesses and increase their pedagogical content knowledge.[178] Regardless, Kleickmann et al. asserted that teachers should have opportunities to further develop content knowledge and pedagogical content knowledge through offerings that focus on subject-specific content and student learning.[179] As such, they declare professional development as "a key area for educational reform."[180]

Garet et al. also advocated adjustments to our professional development offerings based on their research of math and science teachers. They found that:

> …although teachers generally support high standards for teaching and learning, many teachers are not prepared to implement teaching practices based on high standards. Many teachers learned to teach using a model of teaching and learning that focuses heavily on memorizing facts, without also emphasizing deeper understanding of subject knowledge.[181]

Therefore, effective inservice training must allow educators to "become actively engaged in meaningful discussion, planning, and practice."[182] They also indicated "that sustained and intensive professional development is more likely to have an impact … than is shorter professional development."[183] In order to enhance student outcomes, training should incorporate subject-specific content, provide hands-on opportunities, and allow means for

[178]Kleickmann et al., 101.

[179] Ibid., 100.

[180] Ibid.

[181] Michael S. Garet, Andrew C. Porter, Laura Desimone, Beatrice F. Birman and Kwang Suk Yoon, "What Makes Professional Development Effective? Results from a National Sample of Teachers," *American Educational Research Journal* 38, no. 4 (2001): 916.

[182] Ibid., 925.

[183] Ibid., 935.

teachers to integrate the new concepts into their instructional activities.[184] They stated that the results of their study indicated a "profound importance of subject-matter focus in designing high-quality professional development."[185] For music teachers to gain understanding and ability, inservice training must focus on building knowledge specific to the content area and to the new health and wellness components of the TEKS. Additionally, it should allow time for teachers to discuss and engage with the topics, and create a long-term plan to practice pedagogical implementation.

Many music educators have recognized their own need for development concerning issues related to health in musical practice. Bowles observed that, though university professors prepare teachers to enter the field, their programs lack the power, structure, and means to "meet the needs of teachers over a lifetime of teaching in countless situations."[186] Bowles also found that choir directors highly ranked health-related issues and general music as areas of needed training.[187] Some participants specifically identified "vocal and instrumental pedagogy" as an area of concern.[188]

Many professional development opportunities lack sufficient funding to ensure effective implementation. Bowles found that development opportunities are "generally not supported, either with funding or by releasing teachers from their teaching responsibilities."[189]

[184] Garet et al., 935.

[185] Ibid., 936.

[186] Bowles, 35.

[187] Ibid., 37.

[188] Ibid.

[189] Ibid., 35.

Furthermore, programs that bring together various stakeholders (musicians, teachers, and administrators) to design effective, long-term development demand considerable expenditures of time and funding.[190] In many cases, the responsibility to financially support the cost of development rests with educators.[191] Due to the cost of some of these programs, teachers may not seek the development necessary to address the TEKS mandates. The possibility also exists that adequate, long-term opportunities that address the musician health and wellness components have yet to be developed. The ability of local agencies to develop and implement adequate development opportunities remains unexamined.

This lack of financial resources introduces disparities between what educators want and what they seek in development. Bowles found that sixty-three percent of respondents to her survey indicated that they were "quite satisfied with local or state academic leadership at professional development programs."[192] She also noted that fifty-four percent indicated that they were interested in learning from "nationally or internationally renowned leaders."[193] However, despite this interest, she shared that participants were "not particularly willing to pay what may be considered the 'market' rate" for these presenters."[194] To save costs, organizations often utilize the "expertise of local and state educators" in developing and presenting effective programs, and draw from other local experts within the state.[195]

[190] Bowles, 35.

[191] Ibid.

[192] Ibid., 39.

[193] Ibid.

[194] Ibid.

[195] Ibid.

In 2009, the National Staff Development Council published a collaborative study on the status of professional development in the United States. In his forward to the report, James B. Hunt, Jr., then governor of North Carolina, advocated for a greater emphasis placed on building teacher capacity. This advocacy was in response to the report's findings:

> But as this report shows, in education, professional learning in its current state is poorly conceived and deeply flawed. Teachers lack time and opportunities to view each other's classrooms, learn from mentors, and work collaboratively. The support and training they receive is episodic, myopic, and often meaningless.[196]

The study's authors summarized their key findings in the list below (the points below are not presented in the same order as the source material; I omitted findings not relevant to the current discussion):

- Sustained and intensive professional development for teachers is related to student achievement gains.
- Effective professional development is intensive, ongoing, and connected to practice; focuses on the teaching and learning of specific academic content; is connected to other school initiatives; and builds strong working relationships among teachers.
- More than 9 out of 10 U.S. teachers have participated in professional learning consisting primarily of short-term conferences or workshops. Fewer teachers participated in other forms of traditional professional development which include university courses and observation visits to other schools.
- While teachers typically need substantial professional development in a given area (close to 50 hours) to improve their skills and their students' learning, most professional development opportunities in the U.S. are much shorter. … a majority of teachers (57 percent) said that they had received no more than 16 hours (two days or less) of professional development during the previous 12 months on the content of the subject(s) they taught.

[196] Linda Darling-Hammond, Ruth Chung Wei, Alethea Andree, Nikole Richardson and Stelios Orphanos, *Professional Learning in the Learning Profession: A Status Report on Teacher Development in the United States* (Dallas: National Staff Development Council, 2009), 2.

- U.S. teachers report little professional collaboration in designing curriculum and sharing practices, and the collaboration that occurs tends to be weak and not focused on strengthening teaching and learning.
- American teachers say that much of the professional development available to them is not useful.[197]

In harmony with other literature, the authors reported that many school systems tend to provide "one-shot workshops" which "generations of teachers have derided."[198] For the musician mandate of the TEKS to be effective, the inservice training opportunities provided to our secondary choral music educators will need to take a form and manner different than what is commonly employed in many of our country's school systems.

Summary

The findings presented in the reviewed literature support the hypothesis that secondary choral music educators lack experience or means to successfully incorporate the new musician health standards of the TEKS. The introduction of these new standards has required teacher preparation programs to adapt their curricula. However, no meaningful program adjustments have been identified or evaluated. Furthermore, many Texas educators started teaching before the new standards were to have been implemented. Without sufficient training, the literature suggests that educators may work from an incomplete understanding of the physiology, pedagogy, or health and wellness concerns related to music practice. As such, current educators may lack the knowledge and ability to efficiently help students achieve the outlined competencies.

[197] Darling-Hammond et al., 2.

[198] Ibid., 9.

Current instructional delivery methods are not conducive to establishing best practices. The mere presentation of information does not allow for the exploration, understanding, analysis, and application of knowledge required by the TEKS. Likewise, it is not effective in influencing adolescent health-related behavior. Rather, student behavior is most influenced by student-centered methods like critical pedagogy, an approach that incorporates student-led discovery and discussion. Students need examples and models for healthy behavior as well as for other performance and pedagogical considerations. Many educators teach following their experience and often incorporate methods they encountered as students. This continuation of a teaching tradition often neglects the pedagogical demands of the revised standards.

Finally, current inservice development models are inefficient in significantly building educator ability. As teaching experience does not correlate with increased ability to aid student development or achievement, active educators need professional development to gain new skills. Such professional development should focus on subject-specific content and delivery. Likewise, development offerings should incorporate a long-term plan that supports educators through continued interaction. Educators need at least a year of consistent practice in order to adequately present new ideas (such as musician health issues) to their students. As teacher knowledge remains the most significant factor that affects student achievement, Texas students will unlikely gain music-related health and wellness competency without revisions to teacher training and development.

CHAPTER 3

METHODOLOGY AND PROCEDURES

In this chapter, I provide an overview of the study, with a discussion of the design and procedures followed. The discussion also includes the setting of the study and other details concerning the participants and their recruitment, protection of human participants, and informed consent. Finally, I include an outline of the survey and study tool, data collection, study timeline, and analysis.

Research Design

The purpose of this study was to evaluate the awareness, perceived knowledge, and perceived competency of secondary choral music educators in Texas concerning the new musician health objectives in the Texas Essential Knowledge and Skills standards (TEKS). Additionally, the aims of the study also included determining which activities and variables promoted these characteristics. Many active educators were surveyed, and their responses were evaluated against variables that may have influenced their awareness, perceived knowledge, and perceived competency. These factors include several aspects of teacher education, such as the highest degree attained, the major area of study, and specific courses completed as part of teacher training. Additional elements that could affect educators' ability to address and incorporate the revised TEKS include years of teaching experience, school or community setting, professional development and conference attendance, and extracurricular music participation. I employed a quantitative and qualitative research design utilizing data collected through an online survey tool. The timeline consisted of a twenty-four-day testing period for participants to complete an online survey.

Setting of the Study

I conducted the study online through the Qualtrics platform over a twenty-four-day period. This format allowed for research participants from various locations across the State of Texas to participate according to their availability. I also recruited participants online through an emailed invitation. As participants accessed the survey through the URL link provided in the email, they were able to answer the survey questions any time of the day on a public or home computer, or mobile device. Likewise, those who elected not to participate either did not follow the link or declined participation on the Informed Consent page of the survey. All data were automatically stored online, accessible only to the research team.

Participants

All potential participants were recruited from the population of active secondary choral educators in Texas. As the information had no direct bearing on the research questions and resulting data, participants were not invited to identify their gender, age, race and ethnicity, or geographic location. However, I assumed that the participant population mirrored the same demographics of the state's secondary choral educators, including both males and females, a variety of racial and ethnic backgrounds, and ages ranging from the early 20s to the late 60s. Additionally, participants likely represented a wide range of educational and teaching experiences, from recent baccalaureate graduates in their first year of teaching to those nearing the ends of their careers and who have completed graduate study and other advanced training.

The online survey design created the opportunity for all secondary choral educators in Texas to participate in this study. However, with well over 1,200 school districts and 3,000

schools, tracking down the contact information for each secondary choral director in the state would have been unreasonable and burdensome. As such, invitations to participate were sent through two organizations that hypothetically have contact with all secondary music educators: the Texas Music Educators Association (TMEA) and the Texas Music Administrators Conference (TMAC). Additionally, my committee and I reached out to fine arts administrators in our professional networks to invite the educators in their districts to participate. This recruitment method prohibited my ability to ascertain precisely how many educators received invitations to participate, making it impossible to calculate a response rate. However, by contacting the advertising manager for TMEA, I was able to receive the number of active secondary choral educators at the time of the study and identify the total number of those who did not prohibit the sharing of their information with third-party groups.

Participant recruitment primarily depended upon various district fine arts administrators. Throughout the research period, 115 administrators and regional chairs were solicited by email to recruit choral music educators in their respective districts or regions. Of the 2,369 secondary choral educators with active TMEA memberships, only 808 gave TMEA permission to share their contact information with third parties.[199] However, some of these individuals taught in a private setting or at a non-public institution and thus were not eligible to participate in this study.

Potential participants were recruited via email. Each received a message that invited them to participate in the study and provided them a link to the Informed Consent and survey

[199] Numbers retrieved from the TMEA third-party list, received via email correspondence from Zachary Gersch.

tool (see Appendix A). These invitations, along with the enclosed link, were forwarded to the participants by the five TMAC area representatives, the individual district fine arts administrators, and me (see Appendix B). The recruitment method created the potential for participants to receive duplicate invitations, a situation that hopefully encouraged participation. Participants volunteered to take the survey by following the link and continuing with the survey after providing consent. Those who did not wish to participate either disregarded the email, elected not to follow the link, or declined to provide consent on the online Informed Consent page.

Protection of Human Participants

Study participants were secondary choral music educators actively teaching within the State of Texas. The University of North Texas' Office of Research Integrity and Compliance approved the research study. As this study did not include any vulnerable populations, and participants self-selected to participate, no additional approval other than the participant's consent was required. Participants were recruited via an emailed invitation that also included a link to the survey tool. Once clicking on the link, potential participants were provided an explanation of the study that included details regarding the purpose of the study, survey length, time commitment, associated risk, and possible benefit (see Appendix A). As included in the IRB application, no additional risk was associated with participation in the study beyond what would be encountered in regular everyday life. Though there was no direct benefit to the participants, there are possible broader benefits to the research such as the use of the data to improve the training of future music educators. Participants who provided consent were

directed to the survey questions. Those who declined to participate were guided to the end of the survey and were unable to access the survey prompts.

Research Study Instruments

No established research tool to measure educator awareness, perceived knowledge, and perceived competency in this manner currently exists. However, as referenced in the literature review, previous educational research provided some direction for the survey construction. I copied and adapted some prompts from other studies, such as the survey Laursen and Chesky employed to investigate awareness of the NASM musician health guidelines.[200] I adapted other questions to measure certain traits of the dependent variables and generate quantitative data through the use of 5- and 7-point Likert-type scales. I designed the remaining prompts to assess qualitative characteristics.

The first section of the survey captured the independent variables of demographic information from the participants. Here, participants recorded their educational degree level and area of study, coursework, years of teaching experience, school location, professional development opportunities, and extracurricular music activities. The next section provided participants the opportunity to answer prompts measuring awareness and perceived competency by selecting ratings on a Likert-type scale. Educator content knowledge can only be measured through directed assessment tests. As such, the final section of the survey only included general prompts, presented in a multiple-choice format, to measure educator perceptions of the TEKS musician health components. A direct assessment of content

[200] Laursen and Chesky, 143f-43g.

knowledge would have considerably increased the survey time.

Fearing that any direct reference to the TEKS would affect participant recruitment and objectivity of the data, I altered the language of the survey with some aims and details omitted. I removed references to the TEKS and teacher competence from the survey tool, Informed Consent Form, and other documents with which the participants interacted. I summarized the purpose of the study in the following manner:

> The purpose of this study is to investigate the awareness, knowledge, and views of Texas choir teachers about musician health in the choral classroom. Learning what teachers know and practice with respect to musician health may inform how future teachers approach the related concepts, and consequently lead to improved and applicable training opportunities that would directly benefit teachers and their students.[201]

The survey format also served as an additional control for bias. Prompts eliciting responses concerning awareness, perceived knowledge, and perceived competency were arranged so that earlier questions and statements did not affect later responses. Additionally, participants could not backtrack or visit earlier pages of the survey to change their responses resulting from new information or prompts. A graphic was also included on each page of the survey to enable participants to track their own progress toward the end of the survey.

Research Method and Data Collection

The purpose of this research study was to determine if Texas secondary choral music educators are aware of the musician health mandate of the TEKS, perceive the revised TEKS musician health components as required knowledge, and perceive themselves sufficiently competent to help students meet these revised standards. This research comprised a metric

[201] see Appendix A herein.

and parametric study. Data were collected through an online survey where participants self-reported their views and responses. Through the various prompts, participants reported their awareness of the musician health components of the revised TEKS, their perceptions of the of these components as mandated curricular components, and their perceived competency to implement and effectively address these standards in their choral instruction. The participant responses formed the dependent variables of the study. These responses were grouped and then analyzed against the independent variable responses to ascertain any significant relationships. Significant relationships, or the lack thereof, then informed conclusions about whether specific training, activities, or other qualities may promote or hinder educator awareness, perceived knowledge, and perceived competency concerning the musician health mandate of the revised TEKS.

Timeline

The survey and data collection occurred across 24 consecutive days in the middle of the fall 2019 semester. I chose this time to avoid conflicting with major concerts, festivals, or other duties typically associated with teaching secondary music. This timeframe also allowed teachers the opportunity to plan their participation. The first day, I sent the invitations to the regional TMEA choral representatives or chairs, the five TMAC area representatives, and known fine arts administrators to pass on to educators. Two weeks into the study, I sent a reminder and renewed invitation. New district fine arts administrators were also identified and sent invitations to participate around this time. In the third-to-last day, I sent a final reminder and invitation to all organization representatives, known fine arts administrators, and to secondary

choral TMEA members accepting third-party communications. The survey closed at midnight on the final day.

Data Analysis

I downloaded the survey responses from the Qualtrics platform and compiled them into a spreadsheet. I numbered each subject's responses for simple identification—to ensure that their responses to the dependent variables would always coincide with their responses for the independent variables. I removed data from participants who did not complete the entire survey. Likewise, I deleted duplicate survey completions from the same IP address. I then compiled a summary of responses for each survey question, resulting in a percentage for each possible answer. Using SPSS software, the data was analyzed utilizing a repeated-measures ANOVA to identify any significant relationships between independent and dependent variables.

I changed responses factoring into the ANOVA analysis into a numerical format and grouped them according to their associated metrics. This blocking action created an aggregate score for each dependent variable: awareness, perceived knowledge, perceived competency, and self-perceived ability (see Table 3.1). The Awareness Aggregate score (Dependent Variable 1) resulted from a sum of a subject's responses to Questions 8 and 9 on the survey tool. Each question was scored according to participant responses on a 7-point Likert-type scale, from *strongly disagree* (1) to *strongly agree* (7). The 7-point Likert-type rating for Self-Perceived Competency (Dependent Variable 2) was entered directly from Question 10 while the Perceived Competency Aggregate score (Dependent Variable 3) resulted from a sum of Questions 10-14. Questions 15-19 asked participants to identify their perceptions of the various components of the TEKS musician health mandate. Responses that labeled each component as a required or

state-mandated part of the curriculum were given one point while all other ratings received a zero. The scores for Questions 15-19 were combined to form the Perceived Knowledge Aggregate score (Dependent Variable 4). Finally, the 5-point Likert-type scale responses for Questions 20-24 were summed together for the Self-Perceived Ability score (Dependent Variable 5).

Table 3.1

Dependent Variable Blocks

Variable	Title	Score Type	Survey Questions Represented
1	Awareness Aggregate	Sum: 7-Point Likert	8-9
2	Self-Perceived Competency	7-Point Likert	10
3	Perceived Competency Aggregate	Sum: 7-Point Likert	10-14
4	Perceived Knowledge Aggregate	Sum: Yes (1)/No (0)	15-19
5	Self-Perceived Ability Aggregate	Sum: 5-Point Likert	20-24

Table 3.2

Independent Variable 1: Degree Level and Major

Degree	Major	ID
Bachelor's	Music Education (Choral)	1
	Vocal Performance	2
	Music Education (Instrumental)	3
	All other majors	4
Master's	Choral Conducting	5
	Music Education (Choral)	6
	Vocal Performance	7
	All other majors	8
Doctorate	Music Education (Choral), Vocal Performance, and Other	9

I also numbered and grouped responses for the independent variables to facilitate analysis. For example, I blocked together the Degree Level and Major for the highest degree attained. In most cases, only Music Education (Choral Emphasis), Vocal Performance, and Conducting majors were given unique identifiers. In contrast, all other majors—music and non-music alike—were grouped under a single identification (see Table 3.2).

Table 3.3

Independent Variable 4: Professional Development

TMEA	Combination District or Local	All Other	ID
No	No	No	0
Yes	No	No	1
Yes	No	Yes	2
Yes	Yes	No	3
No	No	Yes	4
No	Yes	Yes	5
No	Yes	No	6
Yes	Yes	Yes	7

Other variables that may have affected the aggregate scores were also included in the analysis. These included coursework, professional development, and years of teaching experience. Only Choral Methods (Independent Variable 2) and Vocal Pedagogy (Independent Variable 3) courses were included in this level of the analysis as some of the other courses listed were not likely to have had much effect on the measured aims of the study. Data related to the remaining coursework—most likely due to educator licensing requirements—showed minimal variation between subject responses and would have unlikely had much effect on changes in

the aggregate scores. Professional Development was grouped under a single category (see Table 3.3).

The analysis only recognized whether the subject participated in a professional development course on musician health offered through TMEA, the educator's local school or school district, or through any other source. The assigned identification represents participation in any possible combination of those offerings. Finally, I blocked together years of teaching experience for analysis (see Table 3.4).

Table 3.4

Independent Variable 5: Teaching Experience

Years of Teaching Experience	ID
1-4 years	1
5-9 years	2
10-14 years	3
15-19 years	4
20-24 years	5
25-29 years	6
30+ years	7

Summary

Through this study, I sought to determine (a) the extent to which secondary choral music educators were aware of, perceivably knowledgeable about, and perceivably competent to address the new musician health components of the revised TEKS; and (b) identify the factors that promote these characteristics. In the absence of any established tool, I constructed an online survey to test the hypotheses of these aims following similar research and findings. I

organized the survey with particular attention to the format and language to reduce bias and gain representative data. I invited secondary choral music educators who were members of TMEA or in contact with TMAC members or known fine arts administrators to participate in the study. I sent invitations through these organizations and administrators. Following the study period, I removed incomplete and suspect responses to facilitate the analysis of the remaining data.

CHAPTER 4

RESULTS

Participants

In total, 923 individuals were contacted to participate in the survey or received the invitation with the survey link. Due to the recruitment methods for this study, the actual participation rate cannot be determined as the number of potential participants directly solicited remains unknown. Following the close of the survey, a total of 208 responses were recorded. I removed entries for 25 of these submissions from the data pool as they either represented incomplete surveys or were duplicate submissions from a single IP address. I kept the data for the remaining 183 responses for analysis (N = 183). Compared to the number of emails distributed, the remaining data represent a 19.8% return rate.

Demographics: Independent Variables

Participants represented a variety of geographical areas in Texas. While participants did not share personally-identifying information, a map of the IP addresses from the survey responses revealed that most participants were concentrated in the areas of the known fine arts administrators who were directly contacted to forward the recruitment invitation. Data concerning participants' sex, gender, age, or race were not collected. Some of the participants (n = 23, 12.57%) characterized their school's community or location as a "rural" area, while 49 (26.78%) taught in an "urban" area. The vast majority (n = 111, 60.66%) worked in suburban schools.

Participants' backgrounds concerning their own education, training, and teaching experience were similarly varied. A majority of the participants (n = 115, 62.84%) selected a

bachelor's degree as the highest level of education they had attained; 63 educators (34.43%) selected a master's level while only five (2.73%) had earned a doctorate (see Table 4.1).

Table 4.1

Participant Degree Level and Major

Degree	Major	*n*	%
Bachelor's	Music Education (Choral)	98	53.55
	Vocal Performance	6	3.28
	Music Education (Instrumental)	4	2.19
	All other majors	7	3.83
Master's	Choral Conducting	17	9.29
	Music Education (Choral)	20	10.93
	Vocal Performance	10	5.46
	All other majors	16	8.74
Doctorate	Music Education (Choral), Vocal Performance, and Other	5	2.73

Music Education with a choral emphasis was the most represented baccalaureate field of study (*n* = 98, 53.55%). Of all participants, including those who had master's and doctoral degrees, most (139, 75.96%) pursued Music Education with a choral emphasis during their undergraduate studies. Those with master's degrees in music studied Music Education with a choral emphasis (*n* = 20, 10.93%), Music Education with an instrumental emphasis (*n* = 1, 0.05%), Choral Conducting (*n* = 17, 9.29%), Vocal Performance (*n* = 10, 5.46%), Flute Performance (*n* = 1, 0.05%), Clarinet Performance (*n* = 1, 0.05%), and another unspecified music-related major (*n* = 1, 0.05%). The remaining master's degree participants studied Educational Leadership/Administration (*n* = 5, 2.73%), School Counseling (*n* = 1, 0.05%), MAT in Teaching (*n* = 2, 1.09%), Special Education (*n* = 1, 0.05%), an unspecified education-related

major (*n* = 1, 0.05%), and other unspecified majors (*n* = 2, 1.09%). Participants with a doctorate studied Music Education with a choral emphasis (*n* = 1, 0.05%), Choral Conducting (*n* = 1, 0.05%), Vocal Performance (*n* = 2, 1.09%), and another unspecified musical emphasis (*n* = 1, 0.05%). Participants' teaching experience, as represented by years teaching, spanned one year to 42 years of service, with a mean of 11.76 years (see Table 4.2).

Table 4.2

Participant Teaching Experience

Years of Teaching Experience	*n*	%
1-4 years	44	24.04
5-9 years	46	25.14
10-14 years	34	18.5
15-19 years	22	12.02
20-24 years	15	8.20
25-29 years	14	7.65
30+ years	8	4.37

Participants' teacher training and professional development experiences varied. Of the 183 participants, 167 (91.26%) reported that they completed a choral methods course, and 129 (70.49%) had taken vocal pedagogy during their formal training. Further, 25 respondents (13.66%) did not identify student teaching as a course completed for their certification. Many positively responded when asked about participation in development, training, or conference sessions on musician health issues (see Table 4.3). A large number of participants (*n* = 141, 77.05%) attended musician health training offered through TMEA. Another 47 (25.68%) attended similar training through their local school or district, while 96 (52.46%) selected the "other" category that combined the opportunities provided through the American Choral

Directors Association (ACDA), the National Association for Music Education (NAfME), the National Association for Teachers of Singing (NATS), Chorus America, the Pan American Vocology Association (PAVA), and others. Some of the participants who selected the "other" category (*n* = 30, 16.39%) identified the Texas Choral Directors Association (TCDA) as a source of training on this topic, and 62 (33.88%) selected ACDA. Only seven (3.83%) listed a university source such as a summer workshop or symposium for musician health training. A small number (*n* = 25, 13.66%) responded that they had not attended any training on musician health issues.

Table 4.3

Participant Professional Development

Musician Health Professional Development Participation			*n*	%
TMEA	District or Local	All Other		
No	No	No	25	13.66
Yes	No	No	44	24.04
Yes	No	Yes	58	31.69
Yes	Yes	No	12	6.56
No	No	Yes	9	4.92
No	Yes	Yes	2	1.09
No	Yes	No	6	3.28
Yes	Yes	Yes	27	14.75

Table 4.4

Extracurricular Voice Activities

Activity	*n*	%
1. Direct a Community or Church Choir	42	22.95
2. Sing in a Community or Church Choir	66	36.07
3. Teach Private Voice Lessons	32	17.49
4. Perform as a Vocal Soloist or as part of a Small Ensemble (non-choir)	38	20.77

*Total responses are greater than *N* due to participants falling into multiple categories.

Finally, participants were asked to identify the extracurricular music activities in which they participated at the time of data collection. Only 68 (37.58%) participants left this portion blank. The other 115 (62.84%) participants engaged in either one or a combination of the four options provided (see Table 4.4). Therefore, the majority of participants sang and/or helped others sing outside the choral classroom in addition to their professional activities.

Educator Awareness

Throughout the survey, participants responded to prompts designed to measure their level of awareness concerning the musician health components of the TEKS. Additionally, at the end of the survey, participants directly assessed their beliefs and whether they were aware of the revised TEKS standards before taking the survey. The following tables share participant answers and scores to each of these prompts (see Tables 4.5-4.9). For questions with multiple options, only those that selected the correct answer were uniquely identified.

One group of questions presented a list of programs and policies and asked participants to identify those that address health and safety as they relate to learning and performing music. In response, six (3.28%) participants selected "I do not know" as well as correctly identifying the TEKS. As such, they are concurrently represented in the number of respondents who "Selected the TEKS with other options" as well as "Selected 'I do not know'" (see Table 4.5). Only one participant did not select the TEKS or "I do not know." Also, two participants (1.09%) selected NASM guidelines along with the TEKS. Most participants (*n* = 132, 72.13%) indicated that, according to the State of Texas, the public school music teacher has the primary responsibility to inform and educate students about music-related health and safety issues (see Table 4.6).

Table 4.5

Participant Awareness of TEKS

Question #25: Which of the following currently address health and safety issues as they relate to learning and performing music?		
Selection	*n*	%
Selected only "Texas Essential Knowledge and Skills (TEKS)"	30	16.39
Selected TEKS with other options	20	10.93
Selected "I do not know."	138	75.41

*Total responses are greater than *N* due to participants falling into multiple categories.

Table 4.6

Participant Awareness of Educator Responsibility

Question #26: According to the State of Texas, who has primary responsibility for informing and educating students about health and safety issues related to learning and performing music?		
Selection	*n*	%
Selected "the public school music teacher."	132	72.13
Selected other options or "none of the above."	51	27.87

Another group of questions provided metrics that were combined into an overall awareness score. The awareness aggregate resulted from the sum of participant scores to Questions 8 and 9 on the survey (see Table 4.7). These questions referenced the participants' beliefs concerning whether "learning and performing music may involve hazards that negatively impact health" (Question 8), and whether "a teacher's pedagogical methods may influence (raise or lower) students' risk for injury or health problems" (Question 9). Using the provided 7-point Likert-type scale, participants rated their agreement to the statements from *strongly disagree* to *strongly agree*. Participants appear to agree that a teacher's methods influence students' risk for injury or health problems (M = 5.96, SD = 1.18). Their responses concerning

whether learning and performing music may involve negative health hazards were more varied and trended just below a neutral stance toward more disagreement (*M* = 3.93, *SD* = 1.85). The sum of these scores created a 14-point scale for the aggregate: a score of 2 would signify the most disagreement, 8 neutral, and 14 the most agreement.

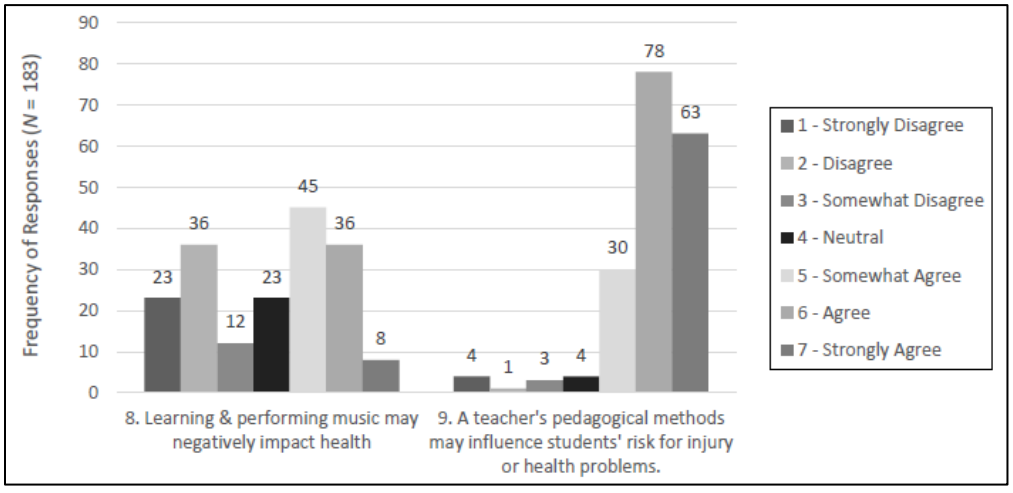
Table 4.7

Measure of Awareness

Question	Mean	Min.	Max	Std Dev
8. "Learning and performing music may involve hazards that negatively impact health."	3.93	1	7	1.85
9. "A teacher's pedagogical methods may influence (raise or lower) students' risk for injury or health problems."	5.96	1	7	1.18
Awareness Aggregate	9.89	2	14	2.36

Figure 4.1

Participant Responses for Awareness Aggregate



The final section of the survey directed participants to indicate whether they were aware of the revised TEKS' musician health components and to identify the sources of this awareness. Over half of the participants (*n* = 97, 53.01%) responded that, prior to taking the

survey, they were not "aware of the TEKS standard mandating the exploration, understanding, and analysis of musician health issues in the choral classroom." The 86 (46.99%) remaining respondents selected a variety of sources that raised awareness of these new objectives (see Table 4.8). The largest number of participants identified their respective teacher preparation programs as a source for building their awareness (*n* = 28, 15.30%). Several participants (*n* = 17, 9.29%) wrote that they became aware of the new components by directly reading the TEKS, either as part of recertification or planning requirements, or from periodic personal study. Introducing a contradictory data point, one participant responded that he was aware of the TEKS prior to taking the survey and also selected "I was not previously made aware of these specific standards."

Table 4.8

Sources for Building Awareness of New TEKS Standards

Source	*n*	%
TMEA email or mailing	6	3.28
Southwestern Musician, the official publication of TMEA	7	3.83
TMEA conference session	14	7.65
Regional meeting/training/development	11	6.01
District Fine Arts Administrator	9	4.92
Other choral directors/colleagues	17	9.29
District-level training/professional development	18	9.84
Teacher preparation program (college degree & teacher certification)	28	15.30
Other	30	16.39
I was not previously aware of these specific standards.	97	53.01

*Total responses are greater than *N* due to participants falling into multiple categories.

Educator Perceptions of Required Knowledge

To assess educator perceptions of required knowledge, I presented participants with the

individual musician health topics as listed in the TEKS. They were then instructed to select one of four options for each topic in order to identify its proper placement within the choral curriculum. These options included (a) “Should NOT be part of course,” (b) “Could be included (but not required),” (c) “Should be included (but not required),” and (d) “REQUIRED (state-mandated) as part of course.” As each topic forms part of the revised TEKS, the State of Texas mandates their inclusion in the choral curriculum. Therefore, participants who selected the fourth option, “REQUIRED (state-mandated) as part of course,” were awarded one point toward the aggregate score, while participants who made any other selection received a score of zero. The sum of these questions created a possible total of five, scoring one point per topic (see Table 4.9).

Table 4.9

Measure of Perceived Knowledge

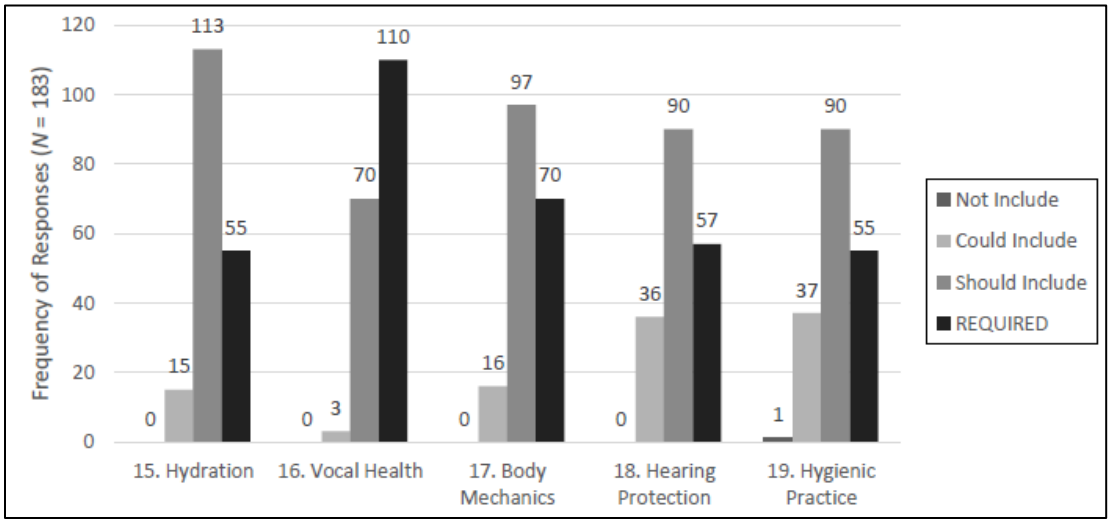
Question	Mean	Min.	Max	Std Dev
15. Hydration for Singers	0.30	0	1	0.50
16. Vocal Health	0.61	0	1	0.49
17. Body Mechanics (musculoskeletal injuries for singers, mechanics and physiology of phonation, etc.)	0.38	0	1	0.49
18. Hearing Protection (sound intensity levels and decibel thresholds associated with hearing loss, types and efficacy of hearing protection, and best practice to avoid noise-induced hearing loss)	0.31	0	1	0.46
19. Appropriate Hygienic Practice (may include factors that lead to impaired singing or injury)	0.30	0	1	0.46
Knowledge Aggregate Score	1.90	0	5	1.69

Vocal health (Question 16) was the only topic for which a majority of participants (*n* = 110, 60.11%) correctly selected “REQUIRED (state-mandated)” (*M* = 0.61, *SD* = 0.49). For all other TEKS musician health components listed in Questions 15, and 17-19, a majority of participants

selected “Should be included (but not required)” and did not recognize or label them as mandated standards (see Figure 4.2).

Figure 4.2

Participant Responses for Perceived Knowledge Aggregate



Educator Competency

In measuring participant responses, I separated educator competency into a competency aggregate and a separate self-perceived ability aggregate score (see Tables 4.10 & 4.11). For the questions that formed the competency score, respondents were instructed to use the provided 7-point Likert-type scale to rate their agreement with statements that reflected competent practices as established by the literature (presented in Chapter 2). Each response was scored accordingly, with 1 point representing *strongly disagree* and 7 points representing *strongly agree*. An individual’s scores were then summed together to form a composite score for competency, with a score of 5 representing the strongest disagreement, and the lowest level of perceived competency, and a score of 35 the strongest agreement or highest level of perceived competency.

Table 4.10

Measure of Perceived Competency

Question	Mean	Min.	Max	Std Dev
10. As a music educator, I feel that I have the understanding and knowledge necessary to deal with the health and safety issues associated with learning music.	5.69	1	7	1.15
11. I allow students to lead discussions on musician health issues during class time.	3.57	1	7	1.57
12. I regularly model for my students during rehearsal.	6.58	4	7	0.59
13. I regularly and consciously provide times for vocal rest during rehearsal.	5.21	1	7	1.39
14. I lead classroom discussions regarding health habits for singers.	5.32	1	7	1.24
Competency Aggregate Score	26.38	14	35	3.75

Table 4.11

Measure of Perceived Ability

Question	Mean	Min.	Max	Std Dev
20. Hydration for Singers	4.66	2	5	0.64
21. Vocal Health	4.57	2	5	0.65
22. Body Mechanics (musculoskeletal injuries for singers, mechanics and physiology of phonation, etc.)	4.07	1	5	0.95
23. Hearing Protection (sound intensity levels and decibel thresholds associated with hearing loss, types and efficacy of hearing protection, and best practices to avoid noise-induced hearing loss)	3.77	1	5	1.05
24. Appropriate Hygienic Practice (may include factors that lead to impaired singing or injury)	3.96	1	5	0.97
Self-Perceived Ability Aggregate Score	21.03	10	25	3.19

Figures 4.3-4.4 display the frequency of responses for each statement. When asked about whether they "feel that [they] have the understanding and knowledge necessary to deal with the health and safety issues associated with learning music," 116 participants (63.39%)

selected either agree or strongly agree. A considerable number of participants (*n* = 55, 30.05%) only felt that they somewhat agreed with the statement while the remaining 12 (6.56%) participants disagreed with the statement or selected neutral. I observed the highest score for agreement with competent practices in association with modeling for students (*M* = 6.58, *SD* = 0.59), and the lowest score with "allow[ing] students to lead discussions on musician health issues during class time" (*M* = 3.57, *SD* = 1.57).

Figure 4.3

Participant Responses for Competency Aggregate - 1

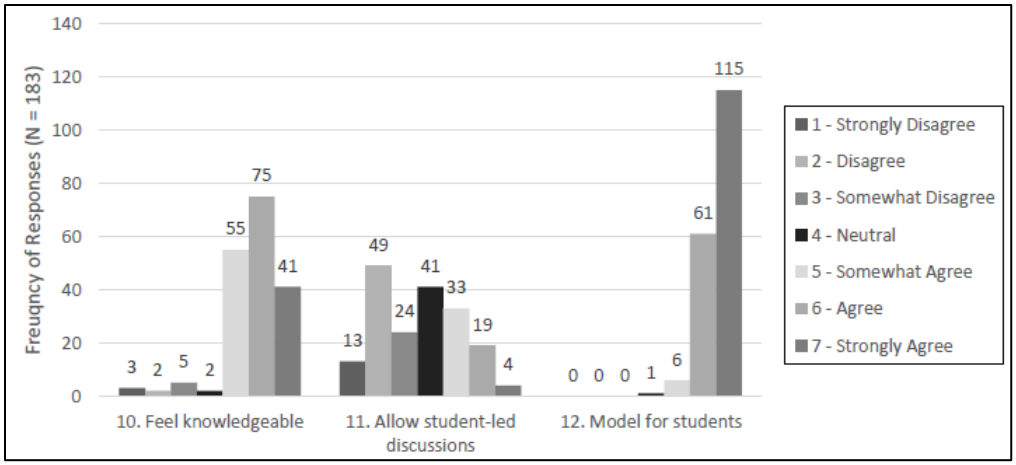


Figure 4.4

Participant Responses for Competency Aggregate – 2

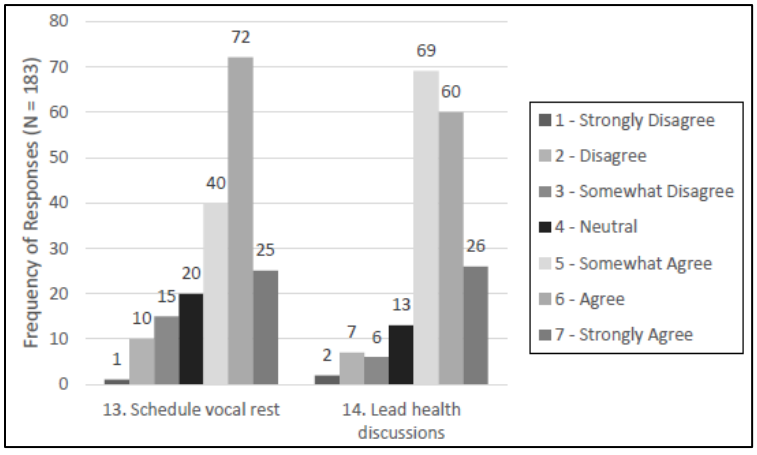


Figure 4.5

Participant Responses for Self-Perceived Ability Aggregate - 1

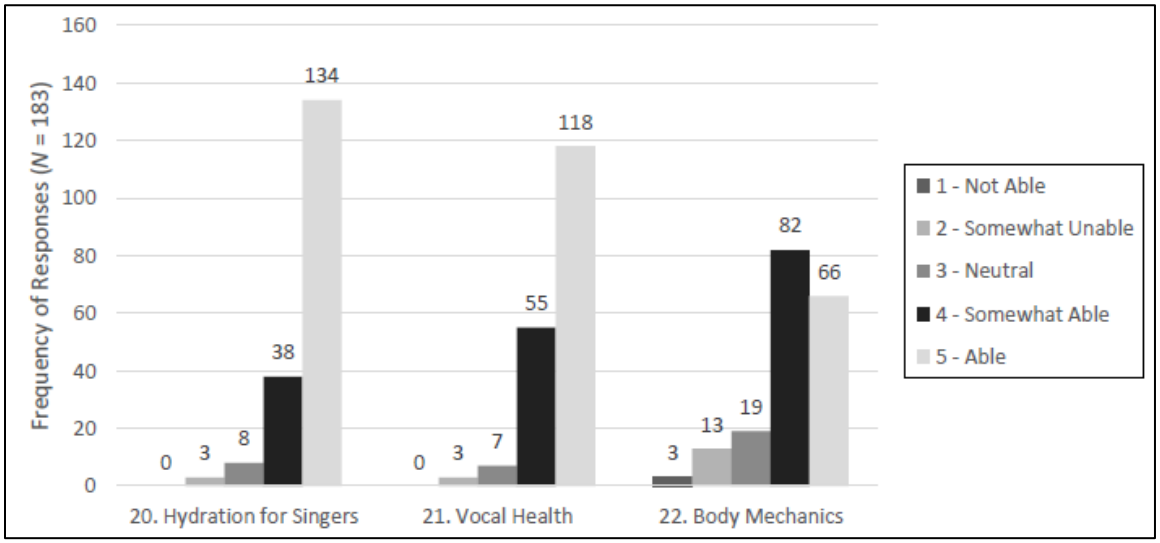
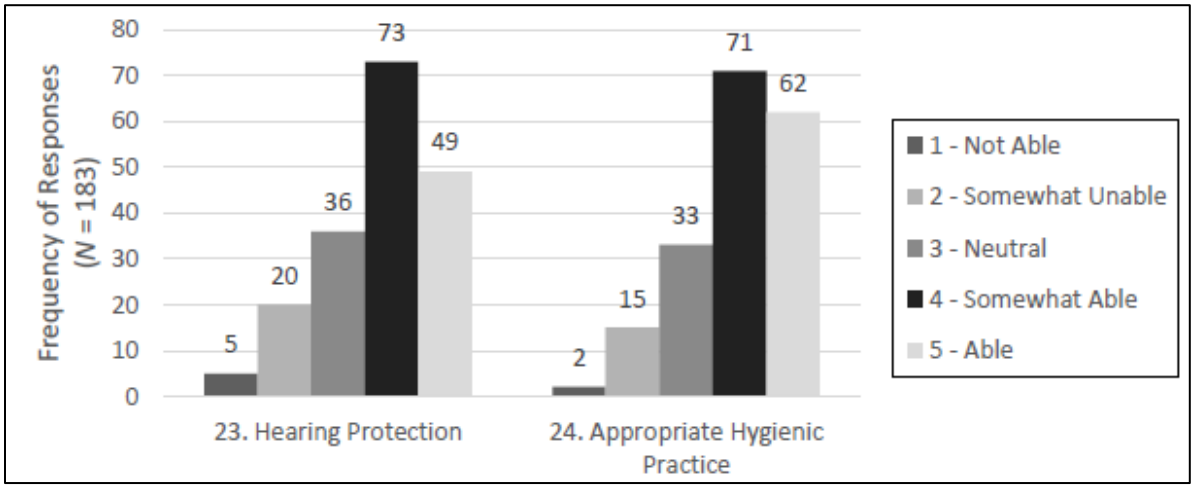


Figure 4.6

Participant Responses for Self-Perceived Ability Aggregate – 2



To measure perceived ability, participants rated their individual ability (self-perceived competency) to teach and incorporate each of the given TEKS objectives. Unlike other measurements in the study, participants responded with the provided 5-point Likert-type scale, ranking ability from 1 (*not able*) to 5 (*able*). As with the other composite scores, the responses

to the five questions were summed to generate a self-perceived ability aggregate score. In this aggregate, a score of 5 signified the least level of ability while 13 denoted the most neutral stance and 25 the highest possible score (see Table 4.11). Though to varying degrees depending on the topic, educators perceived themselves as rather able (self-perceived ability aggregate: M = 21.03, SD = 3.19), with the highest rankings of ability observed in association with "hydration for singers" (M = 4.66, SD = 0.64) and "vocal health" (M = 4.57, SD = 0.65; see Figures 4.5-4.6).

Comparison of Measures by Variable

Each of the questions in the demographics area at the beginning of the survey correlated to one of the independent variables listed in the study. These included degree and field of study (IV1), completing choral methods (IV2) and vocal pedagogy (IV3) courses during certification training or degree, professional development opportunities (IV4), and years of teaching experience (IV5; see Tables 4.12-4.16). Though I presented the means for each dependent variable earlier in this chapter, I incorporated them at the end of each table for reference.

Statistical Analyses

I utilized an alpha level of $\alpha = .05$ for all analyses. The results indicate significant main effects for only three of the independent variables. First, there was a significant main effect for participants' degree or major (IV1), specifically in their aggregate competency score, F (8, 56) = 2.16, $p < 0.05$, $\eta_p^2 = 0.236$ (see Table 4.17). Participants with a bachelor's in music education with a choral emphasis (M = 25.91, SD = 3.56) scored lower than those with a master's degree in vocal performance (M = 29.80, SD = 2.62), and this difference was significant (p = 0.03).

Table 4.12

Participant Responses by Degree Level and Field of Study

Independent Variable 1		Dependent Variables						
Degree Level	Major	*n*		Awareness Aggregate (max. 14)	Self-Perceived Competency (max. 7)	Competency Aggregate (max. 35)	Knowledge Aggregate (max. 5)	Self-Perceived Ability Aggregate (max. 25)
Bachelor's	Music Education (Choral)	98	Mean	9.98	5.59	25.91	1.76	20.64
			Std Dev	2.56	1.07	3.56	1.66	3.34
	Vocal Performance	6	Mean	10.17	4.83	25.17	2.17	23.00
			Std Dev	2.32	1.94	3.76	1.60	2.37
	Music Education (Instrumental)	4	Mean	9.75	5.00	25.00	1.75	18.25
			Std Dev	1.26	0.00	3.74	2.06	4.27
	All other majors	7	Mean	9.14	5.57	26.29	1.86	21.57
			Std Dev	1.86	0.53	2.69	1.07	2.70
Master's	Choral Conducting	17	Mean	9.76	6.06	28.06	1.94	20.82
			Std Dev	1.95	0.66	2.79	1.82	2.38
	Music Education (Choral)	20	Mean	9.50	6.05	27.70	2.60	21.85
			Std Dev	2.52	1.23	3.31	1.96	2.78
	Vocal Performance	10	Mean	9.30	6.60	29.80	2.10	23.30
			Std Dev	2.21	0.52	2.62	1.79	2.06
	All other majors	16	Mean	10.94	5.70	26.45	2.07	21.30
			Std Dev	1.48	1.66	4.41	1.78	3.03
Doctorate	All majors	5	Mean	8.80	6.20	29.20	1.00	21.60
			Std Dev	2.77	0.84	4.66	1.22	4.56
All Respondents (*N*=183)			Mean	9.89	5.69	26.38	1.91	21.03
			Std Dev	2.36	1.15	3.75	1.70	3.19

Table 4.13

Participant Responses by Choral Methods Course Completion

Course Completion	*n*		DV1 Awareness Aggregate (max. 14)	DV2 Self-Perceived Competency (max. 7)	DV3 Competency Aggregate (max. 35)	DV4 Knowledge Aggregate (max. 5)	DV5 Self-Perceived Ability Aggregate (max. 25)
No	16	Mean	10.44	4.75	25.19	2.50	19.56
		Std Dev	2.13	2.21	5.06	1.71	3.27
Yes	167	Mean	9.84	5.78	26.49	1.86	21.17
		Std Dev	2.38	0.95	3.60	1.69	3.15
All Respondents (*N*=183)		Mean	9.89	5.69	26.38	1.91	21.03
		Std Dev	2.36	1.15	3.75	1.70	3.19

Table 4.14

Participant Responses by Vocal Pedagogy Course Completion

Course Completion	*n*		DV1 Awareness Aggregate (max. 14)	DV2 Self-Perceived Competency (max. 7)	DV3 Competency Aggregate (max. 35)	DV4 Knowledge Aggregate (max. 5)	DV5 Self-Perceived Ability Aggregate (max. 25)
No	16	Mean	10.39	5.11	24.87	1.80	19.52
		Std Dev	2.09	1.36	4.14	1.59	3.06
Yes	167	Mean	9.68	5.94	27.01	1.96	21.66
		Std Dev	2.44	0.95	3.40	1.75	3.03
All Respondents (*N*=183)		Mean	9.89	5.69	26.38	1.91	21.03
		Std Dev	2.36	1.15	3.75	1.70	3.19

Table 4.15

Participant Responses by Professional Development

PD Combination			*n*		DV1	DV2	DV3	DV4	DV5
TMEA	District or Local	All Other			Awareness Aggregate (max. 14)	Self-Perceived Competency (max. 7)	Competency Aggregate (max. 35)	Knowledge Aggregate (max. 5)	Self-Perceived Ability Aggregate (max. 25)
No	No	No	25	Mean	9.52	5.52	26.04	1.76	19.36
				Std Dev	2.87	1.12	4.39	1.67	4.41
Yes	No	No	44	Mean	10.66	5.52	25.70	2.14	21.41
				Std Dev	2.11	1.32	4.12	1.82	2.53
Yes	No	Yes	58	Mean	9.76	5.86	26.83	2.10	21.47
				Std Dev	1.98	0.50	1.73	1.15	2.52
Yes	Yes	No	12	Mean	8.00	5.83	25.42	1.33	21.33
				Std Dev	3.05	0.94	3.45	1.61	2.84
No	No	Yes	9	Mean	11.00	4.78	25.11	0.67	18.67
				Std Dev	1.73	1.64	2.85	1.00	3.00
No	Yes	Yes	2	Mean	10.00	6.00	28.00	2.00	21.50
				Std Dev	0.00	0.00	2.83	2.83	2.12
No	Yes	No	6	Mean	9.83	5.83	25.67	3.33	21.17
				Std Dev	1.60	0.75	3.72	1.21	2.48
Yes	Yes	Yes	27	Mean	9.74	5.96	27.70	1.63	21.59
				Std Dev	2.61	1.06	3.05	1.64	2.66
All Respondents (*N*=183)				Mean	9.89	5.69	26.38	1.91	21.03
				Std Dev	2.36	1.15	3.75	1.70	3.19

Table 4.16

Participant Responses by Years of Teaching Experience

Years	Sample Size (*n*)		DV1 Awareness Aggregate (max. 14)	DV2 Self-Perceived Competency (max. 7)	DV3 Competency Aggregate (max. 35)	DV4 Knowledge Aggregate (max. 5)	DV5 Self-Perceived Ability Aggregate (max. 25)
1-4 years	44	Mean	9.98	5.59	25.91	1.76	20.64
		Std Dev	2.56	1.07	3.56	1.66	3.34
5-9 years	46	Mean	10.17	4.83	25.17	2.17	23
		Std Dev	2.32	1.94	3.76	1.60	2.37
10-14 years	34	Mean	9.75	5.00	25.00	1.75	18.25
		Std Dev	1.26	0.00	3.74	2.06	4.27
15-19 years	22	Mean	9.14	5.57	26.29	1.86	21.57
		Std Dev	1.86	0.53	2.69	1.07	2.70
20-24 years	15	Mean	9.76	6.06	28.06	1.94	20.82
		Std Dev	1.95	0.66	2.79	1.82	2.38
25-29 years	14	Mean	9.50	6.05	27.70	2.60	21.85
		Std Dev	2.52	1.23	3.31	1.96	2.78
30+	8	Mean	9.30	6.60	29.80	2.10	23.30
		Std Dev	2.21	0.52	2.62	1.79	2.06
All Respondents (*N*=183)		Mean	9.89	5.69	26.38	1.91	21.03
		Std Dev	2.36	1.15	3.75	1.70	3.19

Those with a master's degree in the "other" category (*M* = 26.45, *SD* = 4.41) responded to these questions significantly differently and earned a lower competency aggregate score when compared to participants with a master's in choral conducting (*M* = 28.06, *SD* = 2.79, *p* = 0.01), a master's in music education (choral emphasis; *M* = 27.70, *SD* = 3.31, *p* = 0.02), and a master's degree in vocal performance (*M* = 29.80, *SD* = 2.62, *p* = 0.001). There was no significant main effect for degree or major with respect to the measure of self-perceived competency. However, participants with a master's degree in vocal performance (*M* = 6.60, *SD* = 0.52) responded significantly differently with respect to the self-perceived competency questions as compared to those with a bachelor's degree in vocal performance (*M* = 4.83, *SD* = 1.94, *p* = 0.02) and those with a master's in the "other" category (*M* = 5.70, *SD* = 1.66, *p* = 0.04; see Table 4.18).

Table 4.17

Tests of Between-Participant Effects

Independent Variable	Dependent Variable	Type III Sum of Squares	*df*	Mean Square	*F*	*p*	Partial Eta Squared
1. Deg & Maj	3. Competency Aggregate	205.601	8	25.70	2.17	0.04	0.24
2. Choral Meth Course	2. Self-Perceived Competency	4.731	1	4.73	5.12	0.03	0.08
	3. Competency Aggregate	49.976	1	49.98	4.22	0.05	0.07
4. Prof Dev	2. Self-Perceived Competency	14.785	7	2.11	2.29	0.04	0.22

I observed a significant main effect between professional development and self-perceived competency, F (7, 56) = 2.28, $p < 0.05$, $\eta_p^2 = 0.22$ (see Table 4.17). Participants who only attended training opportunities in the "other" category (*M* = 4.78, *SD* = 1.64) responded

significantly differently to the self-perceived competency prompts than participants who also attended development training through TMEA and their local district or school in addition to opportunities in the "other" category (*M* = 5.96, *SD* = 1.06, *p* = 0.04). There were no significant main effects for professional development and the awareness aggregate score. However, I did observe significant differences in the awareness aggregate responses of participants who only attended TMEA musician training opportunities (*M* = 10.66, *SD* = 2.11). They scored higher in this category when compared to those who attended trainings through their local district or school in addition to TMEA (*M* = 8.00, *SD* = 3.05), and this difference was significant (*p* = 0.03) (see Table 4.19).

Table 4.18

Post Hoc Multiple Comparisons: Degree and Major (IV1)

Dependent Variable	Category Name	Mean Diff	Std Dev	*p*	95% CI	
					Lower Bound	Upper Bound
Self-Perceived Comp	Bachelor: Vocal Performance Master: Vocal Performance	-1.77	1.99	0.02	-3.37	-0.17
	Master: Vocal Performance Master: Other	1.29	1.98	0.04	0.037	2.54
Comp Aggregate	Bachelor: Music Education (Choral) Master: Vocal Performance	-3.89	11.88	0.03	-7.58	-0.20
	Master: Choral Conducting Master: Other	4.43	6.89	0.01	0.56	8.30
	Master: Music Education (Choral) Master: Other	4.08	6.63	0.02	0.35	7.80
	Master: Vocal Performance Master: Other	6.18	7.08	0.001	1.70	10.65

Table 4.19

Post Hoc Multiple Comparisons: Professional Development (IV4)

Dependent Variable	Category Name	Mean Diff	Std Dev	*p*	95% CI	
					Lower Bound	Upper Bound
Awareness Aggregate	TMEA Only TMEA and District/Local	2.66	5.98	0.03	0.15	5.17
Self-Perceived Comp	Other TMEA, District/Local & Other	-1.19	2.21	0.04	-2.35	-0.02

Finally, whether participants completed a choral methods course significantly affected their competency aggregate, F (1, 56) = 4.215, $p < 0.05$, $\eta_p^2 = 0.07$, and their self-perceived competency scores, F (1, 56) = 5.123, $p < 0.05$, $\eta_p^2 = 0.08$ (see Table 4.17). However, as signified by the partial eta-squared statistic, the magnitude of these effects appears minimal. Participants who reported taking a choral methods course scored higher in the self-perceived competency (though still within the standard deviation; M = 5.78, SD = 0.95) and competency aggregate metrics (M = 26.49, SD = 3.6) when compared to those who did not take the course (M = 4.75, SD = 2.21; M = 25.19, SD = 5.06, respectively). There were no other statistically significant differences between group means.

Summary

Of the observed effects, I observed significant differences between only a few of the subpopulation groups. Participants with master's degree in vocal performance reported that they participated in competent practices more than their bachelor of music education with a choral emphasis counterparts. Likewise, those with a master's in music education with a choral emphasis, choral conducting, and vocal pedagogy all reported higher implementation of these

techniques than participants with a master's degree in the "other" category. Participants who attended local district or school and "other" musician health training opportunities in addition to TMEA offerings reported higher levels of self-perceived competency than those who attended only TMEA trainings. Participation in professional development opportunities had no significant effect upon the participants' measures of awareness.

In summary, only three independent variables had any significant effect on participant responses. First, participants' degree level or major affected their competency aggregate score. Second, professional development significantly affected measures of self-perceived competency. Third, participants who completed a choral methods course as part of their formal education reported higher levels of self-perceived competency and reported higher participation in competent practices in the classroom (competency aggregate). No other significant differences were reported. In other words, degree level or major, completion of a choral methods course, and professional development did not have a significant effect on any other metric. Also, completion of a vocal pedagogy course and teaching experience had no significant effect upon measures of awareness, perceived knowledge, self-perceived competency, or self-perceived ability.

CHAPTER 5

DISCUSSION

The purpose of this study was to evaluate and measure the awareness, perceived knowledge, and self-perceived competency of secondary choral music educators concerning the new musician health objectives found in the Texas Essential Knowledge and Skills standards (TEKS). A secondary purpose of this study was to identify the activities and variables that promote the development of these characteristics. In this chapter, I will discuss answers to each of the research questions, their implications for secondary choral music educators, and suggestions for future research.

Research Question 1

Are secondary choral educators aware of the revised musician health mandate and its components?

Study participants generally indicated that they were unaware of the mandate and the TEKS objectives related to musician health and safety. A majority of the participants revealed that they did not know that the current standards mandate the exploration, understanding, and analysis of musician health issues in the choral classroom. Furthermore, only a small portion of the participants correctly identified the TEKS as a policy that includes objectives addressing musician health issues. These observations run counter to previous research on the voluntary incorporation of the national standards in music, which suggest familiarity with the content. Orman found that educators strived to include the standards in their instruction after gaining an awareness of them during their initial teacher training or professional development

activities.[202] This discrepancy may result from a lack of awareness about the new standards among leaders of undergraduate programs and organizers of inservice development courses.

Findings are consistent with other studies that scrutinized preservice and inservice training on these topics. One team of researchers found that musician health remained mostly absent from music methods curricula.[203] Laursen and Chesky feared that this lack of instruction would leave educators "generally unaware of the health and safety issues associated with learning to play a musical instrument."[204] Another researcher surmised that the many demands on teacher education programs might prohibit them from adequately preparing their students for the various situations they would encounter throughout their careers.[205] A lack of training on this topic likely contributed to the low awareness reported among the present study participants.

In contrast to self-reported awareness, mean scores for the awareness aggregate indicated a general cognizance of the influence music practice and performance might have on health. However, this awareness may relate more to the belief that improper pedagogy and practice may negatively impact health than a recognition of the inherent risks associated with musical practice. Less than half of the participants believed that learning and performing music might impact health. However, most participants agreed that an educator's pedagogical methods might influence a student's risk for injury or health problems. Additionally, most participants indicated that the responsibility to educate students about music-related health

[202] Orman, 156, 162.

[203] Laursen and Chesky, 140.

[204] Ibid.

[205] Bowles, 35.

and safety issues rests with the public school music educator. Though the participants may have reported varying levels of awareness for the risks involved with musical practice, they appear to agree that it is their duty to help students navigate their studies in a healthy manner.

Research Question 2

Do secondary choral educators properly perceive the revised TEKS components as required curricular knowledge?

A majority of participants did not generally perceive the musician health topics as required components of the choral curriculum. However, with the exception of only one participant's response for a single topic, all participants indicated that the TEKS' musician health-related topics had a place in the choral curriculum. Participant responses differed regarding the level of inclusion for each concept. Even though participants did not know that each component is a required standard, they generally held favorable views for including each topic in the choral curriculum. A higher number of participants specified that vocal health should be a required component of the choral curriculum than those who selected that it either could be or should be part of the course. The largest number of participants indicated that all other TEKS objectives should be included as part of the choral curriculum. However, the majority failed to recognize hydration, body mechanics, hearing protection, and hygienic practice as required curriculum components. In general, participants did not view the TEKS' musician health components as mandated standards for student development.

This finding is different from the results that Orman published. While she found that educators were generally aware of the national standards and made strides to include them, the participants of the present study did not recognize each of the TEKS topics for musician

health as a required standard.[206] Unlike national standards, the state-level standards may not form an "active part of their teaching."[207] Unless practicing educators deliberately study the TEKS or participate in targeted development, they will unlikely gain the knowledge requisite for these components. Other researchers supported this assertion and reported that educators might not have sufficient understanding to address health issues or help their students as they negotiate the demands of singing in adolescence.[208] Without direct intervention, educators are more likely to teach the way they were taught rather than adapt their instruction to include new objectives.[209]

Research Question 3

How do secondary choral educators perceive their own competency to successfully teach this material and incorporate it into their instruction?

The third research question related to whether participants judged themselves sufficiently competent to include each of the new TEKS musician health objectives in their course curriculum and activities. Measures for educator competency were separated into three distinct categories: self-perceived competency, competency aggregate, and self-perceived ability. Within each category, mean scores generally indicated high levels of perceived competency and ability despite a general lack of awareness and perceived knowledge concerning the revised TEKS objectives.

Participants reported that they had the necessary understanding and knowledge to

[206] Orman, 162.

[207] Ibid.

[208] Nordheim et al., 16; Freer, 88; Garet et al., 916.

[209] Halpern and Hakel, 37.

address the health and safety issues associated with learning music. Only 12 of the 183 participants indicated a negative or neutral response to the question, while almost two-thirds selected that they agreed or strongly agreed with this position. Most participants felt confident that they could address these issues in music performance and practice. Though a large number reported high confidence, a sizable minority also shared that they only "somewhat agreed" with the statement asserting sufficient understanding and knowledge. Future research is required to ascertain why some participants felt neutral, not competent, or only somewhat competent to manage health-related issues in musical practice and identify the factors that influenced these decisions.

In addition to high levels of perceived competence, a majority of participants also reported high rates of adherence to competent practices that build student understanding and health-promoting behaviors. They reported that they regularly model for their students during rehearsal, consciously provide moments for vocal rest, and lead classroom discussions on musician health issues. As shown by the standard deviations to each survey question, participant responses were varied. Participants were least varied in their responses for modeling for students, with a majority agreeing or strongly agreeing that they regularly modeled during their rehearsals. The only activity for which a majority of participants reported low adherence was for allowing students to lead discussions on musician health issues during class time. Despite this variance, participants generally considered their activities more aligned with competent teaching methods than not, as reflected by the competency aggregate score.

Finally, scores for self-perceived ability indicated that the participants generally considered themselves rather able to incorporate and teach each of the TEKS health-related

objectives for music. Participants perceived themselves as most able to incorporate hydration for singers and vocal health. I found greater variation in responses for the other musician health topics. More participants rated their ability lower for body mechanics, hearing protection, and appropriate hygienic practice than those who identified as "able" for each of these objectives. However, mean scores still support the view that the participants positively rated their capability for these standards.

These findings run counter to multiple studies across many fields of education research. However, the explanation for these results may align with the implications of these same researchers. Though Orman asserted that educators attempt to include standards in their instruction, she also found that her study participants did not adequately address the national standards for music despite their awareness and preparation.[210] The high measures for perceived competency and ability could result from participant views of their own efforts, based upon their awareness and training.[211] Halpern and Hakel also asserted that most people generally inaccurately assess their understanding, rendering confidence an unreliable indicator for competence.[212] Though participants reported high levels of self-perceived competency, this measure may not predict actual competence and ability.

The high rates of participant adherence to competent practices are also brought into question by the present research literature. Even when equipped with adequate awareness of the related components and duties, researchers have shown that educators do not fully

[210] Orman, 162-63.

[211] Ibid., 162.

[212] Halpern and Hakel, 40.

address previously established standards. They tend to overestimate the time dedicated to some activities and falsely believe that they adequately incorporate various instructional objectives.[213] Direct observation and analysis would be required to ascertain whether participants effectively incorporate competent instructional activities as reported.

One of the primary themes that emerged among previous researchers was the need for student-led discussions to best affect positive health behaviors and practices among adolescents.[214] More effective methods utilize student-led discussions and activities that require students to think critically and construct possible solutions in place of teacher-centered instruction.[215] The expository approach—often associated with non-performance tasks—remains ineffective in changing adolescent health behavior. Educators who rely upon such traditional teaching methods often fail to impart deeper meaning that students can apply in their personal practice.[216] Several researchers suggest that, for educators to apply effective principles to their own classrooms, they need to adapt their instruction by allowing students to take the lead in discussing and applying health concepts instead of merely following the same methods by which they were taught.[217]

At times, choral educators have provided instruction that promotes unhealthy habits and hinders student progress.[218] As with students, educators may possibly recognize health-

[213] Orman, 157, 162-63.

[214] Nordheim et al., 3-7; Sweet, 10.

[215] Ibid.

[216] Estacio, 1057.

[217] Garet et al., 916; Halpern and Hakel, 37.

[218] Daugherty, Manternach and Price, 346-67; Jamison, 292-298.

related concepts but lack the ability to apply them.[219] In some schools, the choral curriculum is not divided into categories appropriate for each stage of physical development.[220] These factors, coupled with a lack of educator knowledge or ability, often force adolescent singers to engage with inappropriate repertoire selections, requiring them to overexert themselves in singing as well as non-singing activities, and perform with unrealistic expectations.[221] Student frustration and adoption of unhealthy performance habits have also been linked to a lack of educator ability concerning pubescent vocal development in male singers. Freer shared that "many teachers either avoid differentiating instruction or are unsure of how to best meet the vocal and related psychological needs" of adolescent male singers in their choral courses.[222]

Other findings also counter participant conceptions of their own ability. Nordheim et al. found that educators might not have sufficient scientific understanding to make appropriate health judgments.[223] Additionally, noise-induced hearing loss, a condition experienced by many musicians, was found to be "a widespread and serious public health issue that … receive[d] little or no recognition in schools of music."[224] The lower competency and ability ratings for hearing protection found in the present study possibly reflect a lack of intentional exposure and training. In short, the study participants may appropriately recognize concepts related to the TEKS health objectives but not possess sufficient ability to incorporate these standards, despite

[219] Halpern and Hakel, 40.

[220] Jamison, 292.

[221] Ibid., 294-298.

[222] Freer, 88.

[223] Nordheim et al., 16.

[224] Chesky, Dawson and Manchester, 143.

what they may believe.

Research Question 4

What variables favorably support and promote educator awareness, perceived knowledge, and perceived competency with respect to the musician-health components of the revised TEKS?

The final research question related to whether any significant differences existed between participant responses and measurements of the data they provided for the independent variables presented in the survey's demographic section. I observed significant differences in participant scores for three areas: the competency aggregate based on degree or major, self-perceived competency for professional development, and self-perceived competency and competency aggregate for the completion of a choral methods course. Additionally, I did not observe a main effect for the other variables on measures of awareness, perceived knowledge, or perceived competency concerning the health-related objectives of the TEKS standards for music.

Variables that Impact Educator Awareness

Statistical analyses did not reveal a main effect for any variable on participant awareness for the TEKS musician health objectives. Though no significant effect was observed for professional development on awareness, participants who attended professional development offered through TMEA and their local school or district received a significantly lower awareness aggregate score than those who only attended TMEA-hosted training. It is unclear why additional training would result in lower awareness. Similarly, it is unclear why certain types of training, such as TMEA-hosted offerings, would not be associated with a

significant increase in awareness. Additional research is required to differentiate between these development offerings and ascertain the characteristics that may influence educator awareness for the revised TEKS objectives.

Participants did identify several sources that positively influenced their awareness. Presented in order of decreasing frequency, these sources included teacher preparation programs (college degree and certification), district-level training or professional development, other choral directors or colleagues, TMEA conference sessions, regional development, district fine arts administrators, *Southwestern Musician*, and other TMEA mailings or contacts. Though individuals who attended district or school training along with TMEA scored significantly lower for awareness than those who only attended musician health training through TMEA, more participants identified district-level development training as a source for building awareness of the revised TEKS objectives than TMEA-hosted conference sessions or other communication. It is possible that the effectiveness of local training on musician health depends upon the location of the training, the awareness of the local administrators and facilitators, and whether the training addressed the TEKS' standards. Despite this contradiction, none of the possible sources for building awareness appeared to affect a large number of participants. Even though over 86% of participants reported having attended professional development on musician health issues, a majority reported that they were not aware of these standards before participating in the present study.

Variables that Impact Educator Perceptions of Required Knowledge

As with awareness, no variable significantly affected educator perceptions of knowledge for the TEKS musician health objectives. This finding aligns with the implications of previous

researchers who posited that educators make minimal knowledge gains following graduation from their initial teacher training programs.[225] An educator's content knowledge appeared to be "highly dependent on the type of training program they had attended" and not on years of experience or additional degrees.[226] Other researchers suggested that experienced educators may receive the same or even lower content knowledge scores than "student teachers at the end of their teacher education."[227] This study did not include a comparison of initial teacher training programs. Any effort to differentiate the effect of this initial training on educator knowledge would need to differentiate participants based on the programs they attended. However, such a differentiation would likely shed no additional light on the topic; educators with varying experiences and training participated in the present study.

This lack of observed effect aligns with additional research on the topic of educator experience. Researchers studying German math teachers found that years of teaching experience were not associated with scores on a test of their pedagogical content knowledge.[228] Additionally, Halpern and Hakel noted that what people learn from experience could be wrong.[229] Other observations reveal that current development offerings lack meaningful opportunities to build knowledge and ability.[230] As such, experienced educators may not show any greater awareness or knowledge despite requirements to participate in

[225] Kleickmann et al., 100.

[226] Baumert et al., 155.

[227] Kleickmann et al., 99.

[228] Brunner et al., 92.

[229] Halpern and Hakel, 40.

[230] Garet et al., 935.

professional development.[231]

Variables that Impact Educator Perceived Competency

Unlike the measures of awareness and perceived knowledge, I did observe main effects for some independent variables on the self-perceived competency and competency aggregate scores. A participant's degree or major and completion of a choral methods course significantly affected the competency aggregate score, the measure of their perceived adherence to competent activities. For education, participants with a master's degree in vocal performance scored higher than those with a bachelor's degree in music education. Likewise, participants with a master's in choral conducting, vocal pedagogy, and music education scored higher than those with a master's in the "other" category. Individuals who completed a choral methods course scored higher than individuals who did not complete the course as part of their teacher training.

These findings align with previous research on educator competency in other disciplines and likely result from the time and hands-on experience participants had in content-related tasks. Researchers have shared that content knowledge and pedagogical content knowledge develop through formal education and do not informally accrue with additional years of teaching experience in related education fields.[232] Additional studies suggest that training must focus on the related subject matter in order to effectively change educators' pedagogical ability.[233] Likewise, multiple researchers have shared that educators need time and guidance to

[231]Garet et al., 935.

[232] Kleickmann et al., 100.

[233] Garet et al., 936.

develop their delivery and pedagogy concerning new standards.[234] Therefore, this finding is not unexpected since educators with a master's in vocal performance have more formal education focused on areas represented by the revised TEKS. Those with a master's in vocal performance have also likely received more training targeted on content delivery (pedagogy) and should therefore better utilize established practices that support healthy performance.

The higher scores for participants with a master's in choral conducting, music education (choral), and vocal performance compared to those who received a master's in the "other" category should also be expected. Participants in each area have more formal training to develop content knowledge and pedagogical content knowledge concerning musician health issues. This finding supports the need for targeted training over time and across various situations to build competency—something participants with no choral methods experience or advanced degrees or training in conducting, vocal pedagogy, or music education lack. It remains unknown, however, why this observation is not replicated for perceptions of knowledge or awareness. It is possible that participants who earned a master's degree in conducting, vocal performance, or music education have more time working with health-related issues, but not the TEKS objectives themselves.

I also observed higher self-perceived competency ratings among participants who had completed a choral methods course. As with degree and major, choral methods courses typically offer guided opportunities to develop pedagogical knowledge in a formal setting. In this situation, preservice educators typically discuss and rehearse how to teach their future

[234] Baumert et al., 139; Halpern and Hakel, 38.

students and help them achieve the established standards for instruction (in Texas, the TEKS). Furthermore, choral methods students practice and hone their pedagogy in various hands-on experiences throughout the course of a semester. Individuals who did not take such a course would lack this formal development and would need to acquire the related knowledge and skills elsewhere. However, as represented by the partial eta-squared statistic, the data also indicate that completing a choral methods course had a relatively small effect on participants' competency aggregate scores. This diminished influence may be attributable to the need for course instructors to cover various topics in addition to the TEKS. With the numerous concepts they need to address, choral methods professors may not significantly focus on the health issues related to learning and performing music in their curricula.

In addition to completing a choral methods course, participants' professional development experience also significantly affected their reported self-perceived competency. Participants who attended multiple trainings on musician health topics through TMEA, their local school or district, and other sources reported higher levels of self-perceived competency than those who only reported attending similar training offered through "other" sources that were not TMEA or a local school or district. As with the competency aggregate, the additional subject-specific experiences these participants had through TMEA and choral methods courses likely helped contribute to increased competency, as supported by the literature. This observation may also result from inconsistencies in the quality or influence of training represented by the "other" category when compared to offerings hosted by TMEA and local schools or districts. As various opportunities were combined into the "other" professional development category, the effect of a specific training may not have been observed due to the

low frequency of representation among participants. However, those that had higher competency scores may have sought opportunities to increase their knowledge and pedagogical ability.[235]

The lack of observed significant effects for professional development on perceived knowledge, awareness, and ability is supported by previous research. In general, educators across all fields lack sufficient opportunities to continue building their understanding and pedagogical ability following their initial certification training. Many professional development opportunities consist of conference sessions and single-day workshops that address a variety of topics. In contrast to traditional presentation formats, researchers have suggested that professional development should consist of sustained, continuing efforts so that educators gain the requisite understanding and pedagogical skills.[236] Many stand-alone sessions remain ineffective in that they do not provide an opportunity to build skills. To effectively address the new standards, educators would need time and guidance to develop their delivery and pedagogy.[237] The standing literature also suggests that, without deliberate work, educators will not make significant gains to their pedagogical ability following their initial formal education.[238] Thus, educators may engage in health-promoting activities (as the current study findings may support) but do so separately and ignorantly of current TEKS requirements and expectations.

[235] Kleickmann et al., 101.

[236] Garet et al., 935.

[237] Baumert et al., 139; Halpern and Hakel, 38.

[238] Kleickmann et al., 100.

Implications

Although this study's findings are not generalizable, they may point to the importance of training and activities that genuinely affect educator awareness, perceived knowledge, and perceived competency. Participant scores for awareness and perceived knowledge were disparate from their ratings of perceived competency. Educators' self-perceived competency does not appear to relate to their awareness or perceived knowledge concerning the revised TEKS standards' musician health objectives. Educators may possess the ability to adequately address and incorporate the new objectives while lacking awareness or knowledge. However, previous research also demonstrates that teacher confidence serves as an unreliable measure for competence.[239] As such, educators may also perceive themselves as having greater ability in these areas that are not matched by their current levels of awareness and knowledge.

This study's most significant finding was the low frequency of awareness among participants for the revised TEKS objectives concerning health issues related to music practice and performance. The mere addition of these standards did not guarantee that those charged with implementing them would have the understanding and ability to effectively incorporate them into their instructional activities. Though Texas educators may have awareness and knowledge of health concerns unassociated with their awareness and knowledge concerning the TEKS, students may not be receiving the instruction and support needed to meet these standards. Educators cannot address concerns that they do not know exist.

The study's findings also highlight the need for revised and additional training

[239] Halpern and Hakel, 40.

opportunities related to the TEKS music health objectives. Recent graduates appeared no more aware or knowledgeable than their more experienced counterparts, and vice versa. Numerous researchers have shared concerns regarding the efficacy of professional development opportunities.[240]

In order to increase ability concerning the TEKS' health objectives, preservice and inservice training offerings must effectively build educator awareness and knowledge.[241] Kleickmann et al. posited that professional knowledge and beliefs are shaped more by educators' own school experiences than by subsequent experience and development.[242] Additionally, over three-fourths of the present study's participants, including those who would later earn graduate degrees, received a bachelor's degree in music education with a choral emphasis. Due to the prevalence of this degree type among choral educators, teacher preparation programs would serve as an ideal target to initiate curricular revisions that consciously address health issues related to music along with the revised TEKS objectives. The intentional augmentation of the undergraduate curriculum would likely have a large, positive impact upon educator awareness, knowledge, and competency for all future choral music educators.

The incongruences between the TEKS' expectations and the choral music educator certification requirements also demonstrate the need for additions to the teacher preparation curriculum. In the choral classroom, a competent educator should have the necessary

[240] Chesky and Surve, 51; Darling-Hammond et al., 2, 5; Kleickmann et al., 100.

[241] Baumert et al., 145.

[242] Kleickmann et al., 91.

knowledge and pedagogical skills to teach healthy singing and to enable students to develop the ability to independently manage their instruments. However, completing a vocal pedagogy course is not required for music teacher certification in Texas. At the onset of this research, vocal pedagogy was not required to complete a bachelor's degree in choral music education at the University of North Texas. The lack of pedagogical training was similarly displayed in this study: almost a third of the participants did not report completing a vocal pedagogy course before teaching in a public school program. Recognizing the need for these skills, UNT has since adapted its program and added a vocal pedagogy requirement to the undergraduate music education curriculum.

Additional changes to existing course offerings within the curriculum are also needed. Though proficiency in pedagogical content should precede certification, completing a vocal pedagogy course had no observed effect upon measures of participant awareness, perceived knowledge, or perceived competency. Unlike the topics of hydration and vocal health, a vocal pedagogy course may not be the best place to address every component related to musical health and wellness. The revised standards apply to all secondary music instruction and not just to choral music education curricula. Training in body mechanics, hearing protection, vocal health, hydration, and appropriate hygienic practice should occur throughout the collegiate music program. This training should occur in music-centric methods courses so that preservice teachers may develop skills applicable to their subject content and circumstances. I have observed that many preservice teachers complete their required education methods courses through a School of Education alongside their regular content area. Though it may be the most

appropriate venue for some topics, this approach inhibits music educators from developing the awareness and knowledge for the TEKS' musician health-related components.

As with initial training, stakeholders should also seek to implement formal inservice opportunities for current educators to gain facility concerning the revised TEKS health objectives. Unlike present one-and-done offerings, inservice training centered on music-related health issues and the TEKS health objectives needs to provide ongoing, meaningful discourse and opportunity for educators to actively integrate concepts into their instruction.[243] Educators would need to participate in targeted training to build their awareness, knowledge, and competency to adequately adapt their instruction to meet these new standards. Inservice development should be profession-specific and tailored to their content and circumstances in order to build success and competency.[244] Due to the influence observed among study participants, these efforts could be coordinated by the district fine arts administrators, university programs, and professional organizations such as TMEA, or a combination of these groups. Additionally, so that educators could benefit from these offerings, administrators should support the development of high-quality training with available resources while providing choral music educators the opportunity to participate in such programs.[245]

Also of note in this study's findings was the apparent lack of student-led discussions on musician health topics. Researchers in other academic fields have established that effective teaching must "go beyond merely 'delivering' instruction or 'disseminating' information and

[243] Garet et al., 925, 935; Kleickmann et al., 100; Kunter et al., 806.

[244] Kunter et al., 806.

[245] Bowles, 35.

must address issues that affect music students' values, beliefs, and motivations."[246] To consciously change their habits and adopt health-promoting behaviors, students need to actively participate in the discussions and activities that support their development.[247] In comparing the study findings with the established literature, choral music educators may need to adapt their instruction to help their students meet the revised standards.

Since many may lack awareness and knowledge concerning the revised TEKS standards for music, educators and researchers should establish best practices that address the TEKS' health and wellness components in the music classroom. As the TEKS musician health components remain relatively new, I did not find any research study examining the presence or effectiveness of these approaches. For this study, I have referenced findings and approaches from health education and literacy along with other disciplines to inform my hypothesis and provide comparisons. However, future research is needed to provide data and direction specific to music education. Several individual participants in this study earned high scores for awareness and perceived knowledge, and ranked themselves highly in terms of perceived competency. It is possible that effective methods are already being successfully implemented in some choral programs. Such methods should be documented and shared so that all educators may collaboratively increase their capacity to address these standards.

In addition to the data measuring participant awareness, perceived knowledge, and perceived competency, this study's findings also indicate that secondary choral music educators will likely incorporate the revised TEKS standards when empowered to do so. The participants

[246] Chesky, Dawson and Manchester, 142.

[247] Estacio, 1058; Mathews, 600-609.

generally recognized that they, as choral music educators, have the primary responsibility to instruct students about health and wellness issues related to learning and performing music. Furthermore, a substantial majority of participants favorably viewed each topic's inclusion as part of the choral curriculum, even if they were unaware that they were already required by the TEKS standards. Given the appropriate information, training, and support, secondary choral music educators in Texas would likely find great success in addressing the standards and provide other educators across the country the tools to do the same.

Limitations of the Study

There are several limitations to this study. The first is potential selection bias among participants. In the consent form presented at the beginning of the survey, potential participants read the following statement: "… you might not want to participate in this study if you feel uncomfortable discussing musician health, or do not teach choir at a secondary level in the State of Texas." Some individuals may have been more inclined to participate in an area where they had strength. Likewise, others who felt unaware, lacked related knowledge, or did not perceive themselves as competent concerning musician health may have elected to not participate and are therefore not represented in the data. Due to self-selection, this population may not fully represent the population of the state's secondary choral music educators.

Another limitation is the inability to measure educator knowledge concerning the TEKS musician health components. In the present study, I could not directly measure the participants' knowledge concerning each of the TEKS' musician health components. Such an endeavor would have required content-specific tests that would not have been practical to include in a ten-minute survey. Future research is needed to determine what educators know

concerning hydration, vocal health, body mechanics, hearing protection, and appropriate hygienic practice pertaining to learning and performing music. It may be advantageous for researchers to consider other tools besides those found in a traditional survey in order to obtain a more complete and accurate picture of educator knowledge concerning these components.

The most significant limitation of this study is participation. Due to the low return rate (19.8%), the study's population does not represent all the potential participants contacted via district fine arts administrators and the TMEA third-party contact list. Similarly, this relatively small pool may not accurately represent the over 2,300 secondary choral music educators in the State of Texas. Additionally, some districts require local approval before teachers or students receive research solicitations through official channels. Due to the timing restraints and local processes to request such approval at the district level, some districts were not permitted to share the invitation to participate with their choral music educators. Unless these teachers received a forwarded invitation and survey link through other channels, they did not receive the opportunity to volunteer.

Finally, educators in rural settings represented only a small portion of the study participants. Future researchers might consider recruitment methods that would include more educators from rural areas. Researchers should also note that communication and solicitation through district fine arts administrators proved the most effective recruitment method for this study. Though I did not analyze or report location data as part of the study, a map of IP addresses for participant responses showed that most completed survey responses were sent from the same areas as the known fine arts administrators who forwarded the study

invitations. Future researchers may benefit from coordinating with specific districts to limit the number of participants and focus on a defined population, include a balance of rural, suburban and urban areas, and increase response rates. With a limited and defined recruitment pool, researchers would also be able to study additional details and record data through classroom observations.

Recommendations for Future Research

Health and wellness in learning and performing music remain underrepresented topics in the music education literature. Researchers have shared disturbing findings that indicate educators' lack understanding and pedagogical ability in this area. Additionally, they suggest that customary teaching methods may not promote positive changes in adolescent health-related behaviors. Additional research is needed to identify and analyze educator classroom practices concerning the TEKS' musician health objectives. These studies could catalog current teaching methods that address the standards and gauge their effectiveness in influencing student behavior.

Future work may also better define what educators should know and teach (best practices) for each of the musician health competencies. Additional studies could also directly assess pedagogical ability regarding the TEKS standards, evaluate educator beliefs concerning health topics, examine the health effects of music participation, study the effectiveness of the current classroom activities and approaches on these topics, or assess student success in meeting the standards. The resulting findings could inform the development of best practices for training new teachers and designing adequate professional development opportunities so that practicing educators may gain the pedagogical ability to address these standards.

Furthermore, they would likely have a significant positive effect on teacher training, educator instruction, and student ability in relation to these TEKS components.

Finally, future research should compare choral methods and vocal pedagogy courses in teacher preparation programs. In the present study, completing a choral methods or vocal pedagogy course was not associated with significant differences in participant responses for awareness or perceived knowledge. A comparison of course curricula could reveal what skills participants should develop in these courses and identify what topics may not receive adequate coverage. In addition to establishing best practices for inservice teachers, findings from continued research may suggest improvements to these and other teacher preparation courses to improve the awareness, knowledge, and understanding of future music educators.

APPENDIX A

INFORMED CONSENT NOTIFICATION AND SURVEY TOOL

TITLE OF RESEARCH STUDY: Musician Health in the Choral Classroom

RESEARCH TEAM:
Student Investigator: Gideon Burrows, University of North Texas (UNT), College of Music, Division of Conducting & Ensembles

This project is part of a doctoral dissertation being conducted under the supervision of Faculty Supervisor: Dr. Allen Hightower, University of North Texas (UNT), College of Music, Division of Conducting & Ensembles

You are being asked to participate in a research study. Taking part in this study is voluntary. The investigators will explain the study to you and will any answer any questions you might have. It is your choice whether or not you take part in this study. If you agree to participate and then choose to withdraw from the study, that is your right, and your decision will not be held against you.

You are being asked to take part in a research study about investigating awareness of and interest of Texas public school choir teachers in musician health issues.

Your participation in this research study involves answering questions in a confidential online survey that will take 10 minutes or less of your time. More details will be provided in the next section.

You might want to participate in this study if you are a choral director interested in advancing research in health and pedagogy, and in improving teacher training and development offerings. However, you might not want to participate in this study if you if you feel uncomfortable discussing musician health, or do not teach choir at a secondary level in the State of Texas.

You may choose to participate in this research study if you are an educator teaching at the secondary level in the State of Texas.

The reasonable foreseeable risks or discomforts to you if you choose to take part is the time required to participate in the study survey which you can compare to the possible benefit of helping the investigators learn more about your knowledge, perception and needs regarding musician health in your classroom. You will not receive compensation for participation.

DETAILED INFORMATION ABOUT THIS RESEARCH STUDY: The following is more detailed information about this study, in addition to the information listed above.

PURPOSE OF THE STUDY: The purpose of this study is to investigate the awareness, knowledge and views of Texas choir teachers about musician health in the choral classroom. Learning what teachers know and practice with respect to musician health may inform how future teachers approach the related concepts, and consequently lead to improved and applicable training opportunities that would directly benefit teachers and their students.

TIME COMMITMENT: Participation in this study is expected to last approximately 5-10 minutes.

STUDY PROCEDURES: You will be asked to answer 28 questions in a confidential online survey. Once providing your consent below, you will be asked to answer each question as honestly as possible. This procedure will take about 10 minutes of your time.

POSSIBLE BENEFITS: This study is not initially expected to be of any direct benefit to you, but we hope to learn more about what teachers know and how they view musician health concepts as it relates to the choral rehearsal and secondary choral program. Your responses may help inform the training of future music educators and ensure that such training addresses applicable needs of the choral classroom.

POSSIBLE RISKS/DISCOMFORTS: This research study is not expected to pose any additional risks beyond what you would normally experience in your regular everyday life. All your responses to the survey questions are confidential. However, if you do experience any discomfort, please inform the research team at (801) 787-0860.

If you experience excessive discomfort when completing the research activity, you may choose to stop participating at any time without penalty. The researchers will try to prevent any problem that could happen, but the study may involve risks to the participant, which are currently unforeseeable. UNT does not provide medical services, or financial assistance for emotional distress or injuries that might happen from participating in this research. If you need to discuss your discomfort further, please contact a mental health provider, or you may contact the researcher who will refer you to appropriate services. If your need is urgent, (please contact the researchers at [redacted] or [redacted].

COMPENSATION: None.

CONFIDENTIALITY: Confidentiality will be maintained to the degree possible given the technology and practices used by the online survey company. Your participation in this online survey involves risks to confidentiality similar to a person's everyday use of the internet.

The results of this study may be published and/or presented without naming you as a participant. The data collected about you for this study may be used for future research studies that are not described in this consent form. If that occurs, an IRB would first evaluate the use of any information that is identifiable to you, and confidentiality protection would be maintained.

CONTACT INFORMATION FOR QUESTIONS ABOUT THE STUDY: If you have any questions about the study you may contact Gideon Burrows, [redacted] or Dr. Allen Hightower [redacted]. Any questions you have regarding your rights as a research subject, or complaints about the research may be directed to the Office of Research Integrity and Compliance at 940-565-4643, or by email at untirb@unt.edu.

CONSENT:

- Your selecting to continue with the survey indicates that you have read, or have had read to you all of the above.
- You confirm that you have been told the possible benefits, risks, and/or discomforts of the study.
- You understand that you do not have to take part in this study and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits.
- You understand your rights as a research participant and you voluntarily consent to participate in this study; you also understand that the study personnel may choose to stop your participation at any time.
- By consenting to take the survey, you are not waiving any of your legal rights.

_____

O Yes, I have read the consent information and agree to take part in the research. Please show me the survey.

O No, thank you. I do not wish to continue.

1. Highest degree attained:

   - ○ Bachelor's
   - ○ Master's
   - ○ Doctorate

2. I earned my Bachelor's Degree in:

   - ○ Music Education (choral emphasis)
   - ○ Music Education (instrumental or other emphasis)
   - ○ Vocal Performance
   - ○ Music (other)
   - ○ Other

   [*the following prompt was only shown to those who selected "Master's" and "Doctorate"*]
   I earned my Master's Degree in:

   - ○ Music Education (choral emphasis)
   - ○ Music Education (instrumental or other emphasis)
   - ○ Choral Conducting
   - ○ Vocal Performance
   - ○ Music (other)
   - ○ Other

[*the following prompt was only shown to those who selected "Doctorate" in question 1*]
I earned my Doctorate Degree in:

- ○ Music Education (choral emphasis)
- ○ Music Education (instrumental or other emphasis)
- ○ Choral Conducting
- ○ Vocal Performance
- ○ Music (other)
- ○ Other

3. As part of your training, which of the following courses did you complete? *(Please select all that apply)*

- ☐ choral methods
- ☐ conducting (group)
- ☐ conducting (private study)
- ☐ vocal pedagogy
- ☐ voice literature
- ☐ Alexander Technique
- ☐ acoustics or acoustics of sound
- ☐ psychology of sound/music
- ☐ first aid
- ☐ speech and language pathology
- ☐ speech or voice disorders

- [ ] physiology/anatomy
- [ ] student teaching (clinical)

4. How many years of public school teaching experience do you have?

5. How would you characterize your school's community/location?

- ○ Rural
- ○ Suburban
- ○ Urban

6. I have attended professional development/training/conference sessions on musician health issues sponsored by:
   (Please select all that apply)

   - ☐ American Choral Directors Association (ACDA)
   - ☐ National Association for Music Education (NAfME)
   - ☐ Texas Music Educators Association (TMEA)
   - ☐ National Association for Teachers of Singing (NATS)
   - ☐ Chorus America
   - ☐ Music Teachers National Association (MTNA)
   - ☐ Pan American Vocology Association (PAVA)
   - ☐ My local school or district
   - ☐ Other
   - ☐ I have not attended any training on musician health issues.

7. I currently participate in the following activities:
   (Please select all that apply)

   - ☐ direct a community/church choir
   - ☐ sing in a community/church choir
   - ☐ teach private voice lessons
   - ☐ perform as a vocal soloist or as part of a small vocal ensemble (non-choir)

Please review each statement and mark the appropriate level to which you either agree or disagree.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
8. Learning and performing music may involve hazards that negatively impact health.	○	○	○	○	○	○	○
9. A teacher's pedagogical methods may influence (raise or lower) students' risk for injury or health problems.	○	○	○	○	○	○	○
10. As a music educator, I feel that I have the understanding and knowledge necessary to deal with the health and safety issues associated with learning and performing with the voice.	○	○	○	○	○	○	○

Please review each statement and mark the appropriate level to which you either agree or disagree.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
11. I allow students to lead discussions on musician health issues during class time.	○	○	○	○	○	○	○
12. I regularly model for my students during rehearsal.	○	○	○	○	○	○	○
13. I regularly and consciously provide times for vocal rest during rehearsal.	○	○	○	○	○	○	○
14. I lead classroom discussions regarding health habits for singers.	○	○	○	○	○	○	○

Please review each content topic below and select the label that best describes its placement in the curriculum of the choral classroom.

	Should NOT be part of course	Could be included (but not required)	Should be included (but not required)	REQUIRED (state-mandated) as part of course
15. Hydration for Singers	○	○	○	○
16. Vocal Health	○	○	○	○
17. Body Mechanics (musculoskeletal injuries for singers, mechanics and physiology of phonation, etc.)	○	○	○	○
18. Hearing Protection (sound intensity levels and decibel thresholds associated with hearing loss, types and efficacy of hearing protection, and best practice to avoid noise-induced hearing loss)	○	○	○	○
19. Appropriate Hygienic Practice (may include factors that lead to impaired singing or injury)	○	○	○	○

Please rank your current ability to teach and incorporate the following content curricula.

	Not Able	Somewhat Unable	Neutral	Somewhat Able	Able
20. Hydration for Singers	○	○	○	○	○
21. Vocal Health	○	○	○	○	○
22. Body Mechanics (musculoskeletal injuries for singers, mechanics and physiology of phonation, etc.)	○	○	○	○	○
23. Hearing Protection (sound intensity levels and decibel thresholds associated with hearing loss, types and efficacy of hearing protection, and best practices to avoid noise-induced hearing loss)	○	○	○	○	○
24. Appropriate Hygienic Practice (may include factors that lead to impaired singing or injury)	○	○	○	○	○

25. Which of the following currently address health and safety issues as they relate to learning and performing music?
(Please select all that apply)

- [ ] NASM guidelines
- [ ] NAfME membership requirements
- [ ] NATS membership requirements
- [ ] Texas Essential Knowledge and Skills (TEKS)
- [ ] Texas Teacher Certification Requirements
- [ ] Pediatric physician certification requirements
- [ ] I do not know.

26. According to the State of Texas, who has primary responsibility for informing and educating students about health and safety issues related to learning and performing music?

- ○ the district fine arts administrator
- ○ the building administrator
- ○ the private voice teacher employed in a school district
- ○ the public school music teacher
- ○ the student's parents/guardians
- ○ the student's primary care physician
- ○ the student's otolaryngologist
- ○ hearing protection manufacturers
- ○ None of the above

According to the Texas Essential Knowledge and Skills (TEKS) standards ratified in 2013, since the 2015-16 school year, every public secondary music educator has been required to:

"facilitate exploration, understanding, analysis, and application of knowledge regarding health and wellness concepts related to musical practice such as body mechanics, hearing protection, vocal health, hydration, and appropriate hygienic practice."

27. Prior to taking this survey, were you aware of the TEKS standard mandating the exploration, understanding, and analysis of musician health issues in the choral classroom?

- ○ Yes
- ○ No

28. What helped you become aware of these new requirements and standards?
(Please select all that apply)

- ☐ TMEA email or mailing
- ☐ Southwestern Musician, the official publication of TMEA
- ☐ TMEA conference session
- ☐ Regional meeting/training/professional development
- ☐ District Fine Arts Administrator
- ☐ Other choral directors/colleagues
- ☐ District-level training/professional development
- ☐ my teacher preparation program (college degree & teacher certification)
- ☐ Other _____
- ☐ I was not previously made aware of these specific standards.

APPENDIX B

EMAILED INVITATION PROMPTS FOR PARTICIPANT RECRUITMENT

Email Invitation Forwarded to Choral Music Educators

Dear Choral Music Educator:

We are currently conducting a study as part of a doctoral dissertation that requires the assistance of secondary choral music educators who live and work in the State of Texas. For this study, we are investigating choir teachers' awareness and interest regarding musician health issues, and would like to invite you to participate.

Taking part in this study is voluntary. Your participation in this research would involve answering 28 questions in a confidential online survey that will take 6-10 minutes your time. More details are provided at the survey link below.

Survey Link: https://unt.az1.qualtrics.com/jfe/form/SV_2hsQnQCfmZGVt0F

The purpose of this study is to investigate the awareness, knowledge and views of Texas choir teachers about musician health in the secondary choral classroom. Learning what teachers know and practice with respect to musician health may inform how future teachers approach the related concepts, and consequently lead to improved and applicable training opportunities that would directly benefit you and your students.

The survey will be available through **Wednesday, October 30, 2019**. If you would like to participate, please be sure to follow the survey link and submit your responses by the end of that day.

If you have any questions about the study, you may contact Gideon Burrows [redacted] or Dr. Allen Hightower [redacted]. Your help is greatly appreciated.

Sincerely,

Gideon Burrows
DMA Candidate | University of North Texas

Email to TMAC Regional Representatives

Dear [Name of Fine Arts Administrator]:

We are currently conducting a study as part of a doctoral dissertation that requires the assistance and participation of secondary choral music educators in the State of Texas. Since we do not have the contact information for each choir teacher in the state, we felt that the most effective means of inviting participation would be to ask your help and that of the district fine arts administrators in your region.

A short description of the study is included in the information below. If you feel that you may help us with this project, please forward this message and information below to the other district fine arts administrators in your TMAC region, and with the teachers in your own school district. The survey will be available through **Wednesday, October 30, 2019**.

If you have any questions about the study you may contact Gideon Burrows [redacted] or Dr. Allen Hightower [redacted]. Your help is greatly appreciated.

Sincerely,

Gideon Burrows
DMA Candidate | University of North Texas

[Insert "Email Invitation Forwarded to Choral Music Educators"]

Email to Known District Fine Arts Administrators

Dear [Name of Fine Arts Administrator]:

We are currently conducting a study as part of a doctoral dissertation that requires the assistance and participation of secondary choral music educators in the State of Texas. Since we do not have the contact information for each choir teacher in the state, we felt that the most effective means of inviting participation would be to ask your help.

A short description of the study is included in the information below. If you feel that you may help us with this project, please forward this message and information below to the teachers in your own school district. The survey will be available through **Wednesday, October 30, 2019**.

If you have any questions about the study you may contact Gideon Burrows [redacted] or Dr. Allen Hightower [redacted]. Your help is greatly appreciated.

Sincerely,

Gideon Burrows
DMA Candidate | University of North Texas

[Insert "Email Invitation Forwarded to Choral Music Educators"]

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