THE EFFECT OF PILATES RESPIRATION-BASED CLASSICAL VOCAL TECHNIQUE ON STUDENT'S VOCAL PERFORMANCE: A SINGLE-CASE STUDY

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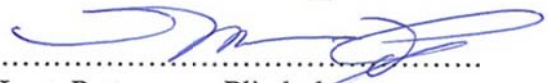

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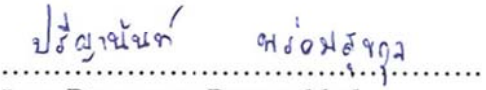

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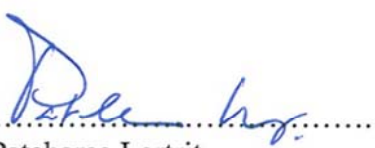

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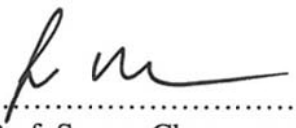

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ABSTRACT

The purpose of this study was to examine the effectiveness of Pilates Respiration-Based Classical vocal technique (PRBC) on student's vocal performance. The participants were two students who were trained in contemporary and classical singing. The single-case (AB) design was employed in this study, consisting of baseline session (A) and intervention session (B). The Classical Voice Rubrics Assessment was used to measure vocal performance outcomes, with findings presented by visual inspection.

During baseline sessions, participants were found to be not breathing sufficiently and not engaging their muscle supports during singing, which caused improper delivery of voice tones. Their vocal performances showed some progress during the second and third intervention sessions, then continuous improvement in their respiration and vocalization from the third and fourth sessions, until the last intervention session, when significant results were sustained. Regarding the PRBC, participants demonstrated improvement in vocal performance, including; 1) Breathing management, 2) Phrase duration, 3) Intonation/ Pitch, and 4) Tonal quality/ Interpretation.

Thus, the results of this study revealed that PRBC enhanced the classical voice performance of students effectively.

KEY WORDS: PILATES RESPIRATION / CLASSICAL VOICE TECHNIQUE /
STUDENT VOCAL PERFORMANCE

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การศึกษาประสิทธิผลของเทคนิคการขับร้องคลาสสิกตามหลักการหายใจแบบพิลาทิสที่มีต่อทักษะการขับร้องเพลงคลาสสิก: การวิจัยกรณีศึกษากรณีเดี่ยว

THE EFFECT OF PILATES RESPIRATION-BASED CLASSICAL VOCAL TECHNIQUE ON STUDENT'S VOCAL PERFORMANCE: A SINGLE-CASE STUDY

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บทคัดย่อ

การวิจัยในครั้งนี้มีวัตถุประสงค์เพื่อศึกษาประสิทธิผลของการร้องคลาสสิกตามหลักการหายใจแบบพิลาทิสที่มีต่อทักษะการร้องเพลงคลาสสิกของนักเรียน ผู้เข้าร่วมวิจัย คือ นักเรียนที่ผ่านการเรียนขับร้องแบบร่วมสมัยและคลาสสิกจำนวน 2 คน การวิจัยในครั้งนี้ใช้ระเบียบวิธีวิจัยกรณีศึกษากรณีเดี่ยว (AB single-case design) การทดลองประกอบด้วยระยะ Baseline (A) และ กิจกรรมการทดลอง (B) เครื่องมือที่ใช้ประเมินผลทักษะการขับร้องคือ Classical Voice Rubrics Assessment การวิจัยในครั้งนี้นำเสนอผลการวิเคราะห์ข้อมูลในรูปแบบกราฟเส้น (Visual inspection) แสดงพัฒนาการทักษะการขับร้องของนักเรียนในแต่ละคน

ผลการวิจัยพบว่า ในระยะ Baseline (A) ผู้เข้าร่วมทั้งสองคนมีลมหายใจที่ไม่เพียงพอในการร้องเพลงและไม่สามารถใช้กล้ามเนื้อในการส่งเสริมการร้องได้อย่างเหมาะสมโดยทำให้ใช้โทนเสียงในการร้องเพลงอย่างไม่มีประสิทธิภาพ เมื่อผู้เข้าร่วมทั้งสองคนได้รับการสอนการร้องคลาสสิกตามหลักการหายใจแบบพิลาทิส (B) ในครั้งที่สองและครั้งที่สาม ทักษะในการร้องเพลงของผู้เข้าร่วมทั้งสองคนค่อยๆพัฒนาขึ้นอย่างต่อเนื่องจนถึงระยะสุดท้าย การใช้เทคนิคการขับร้องคลาสสิกตามหลักการหายใจแบบพิลาทิสในครั้งนี้พบว่าผู้เข้าร่วมทั้งสองมีการพัฒนาทักษะด้านการร้องเพลงที่ดีขึ้นในด้าน 1) การบริหารการหายใจ 2) ระยะของประโยคเพลง 3) ท่วงทำนอง/ ระดับเสียง และ 4) คุณภาพของโทนเสียง/ การตีความ

ผลที่ได้จากการวิจัยสรุปได้ว่าการใช้เทคนิคการขับร้องคลาสสิกตามหลักการหายใจแบบพิลา ทิสที่มีต่อทักษะการขับร้องเพลงคลาสสิกสามารถช่วยพัฒนาทักษะการร้องเพลงคลาสสิกได้อย่างมีประสิทธิผล

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CHAPTER I
INTRODUCTION

1.1 Background of the Study

Singing voice is an instrument that humans have been using for a certain period of time. There are a number of singing methods that have been developed to help singers improve their singing voice and techniques to express the tone and quality. Essentially, voice instructors need to identify students' problems and combine necessary strategies to address them during lessons. There have been a variety of studies that point out to the importance of the singing techniques, which are related to active breathing, and are the primitive source of vocalization (Striny, 2007).Breathing is a part of the respiration system, and it is very important for students to understand their own body function as a whole, rather than know merely to "breathe deeply." Therefore, many students find it hard to engage their abdominal muscles with breathing and to combine the kinematic function with their body (Neely, 2012). For the primitive knowledge of vocalization, students need to understand the correct breathing, combine it with their own body and produce sound.

To sing with full expressions on head tones, students have to devote sufficient timeto take in all key lessons and learning process. In fact, the control level of consciousness is touched upon, saying that aspects should come across as the principle for singing(Nilsson, 2007). The teaching process needs to be simplified to let students use it as their natural habit and practice it adequately. McCoy (2014) supported that many years of singing experience demonstrates that the voice tone is supported by sufficient breathing. The process of voicing is related to the "support" that involves inspiratory and expiratory musculature. On the other hand, most of the voice teachers have been teaching students by their experiences. This strategy can be successful if students adapt them property to their own techniques. Nonetheless, some negative results could still arise if students fail to understand the techniques. Thus, students may take a longer time to understand their own body by combining several

techniques to improve their voice quality. Appelman (1986) clarified that voice pedagogy is a tool to help teachers and students meet the need for improvement, which helps them to combine the lessons with their singing through scientific and aesthetic elements. According to the singing principle, Collyer, Thorpe, Callaghan, and David (2008) concluded that the breathing capacity is influenced by kinematic function that allows the singer to be more proficient in singing. The amount of the air is essentially important, which determines the tonal quality of voice colors. Additionally, there are many methods that are integrated to improve vocalists' ability in higher levels of vocal performance through respiration systems. For instance, there are Alexander techniques, Yoga, and Pilates training. Particularly, Pilates is an exercise method that benefits physical structures. Also, the researcher found the benefits of Pilates respiration techniques through vocal studies.

The embodied values of Pilates define the term "Kinesthetic trace." This explains the body habits that contribute to the healthiness of the body, which raises learners' concern of their body during their routine and during their performances and practices (Holmes, 2013). The benefits of Pilates mainly help to balance the stability of muscle group that affects the core system, which includes abdominal, pelvic floor, and lower back muscles. These guide the supporting muscle groups and ensure proper figure for singing (Kelly, 2006). A number of studies have proved that Pilates method is an effective tool to develop vocal students along with voice pedagogy. The Pilates practices can be applied to help vocalists improve their performance abilities. For example, body flexibility and body exercises prepare singers with necessary performance potentials. Pilates training is the physical-treatment program, which has been invented to help improve the body function to combine with the psychology and develop the relationship between these two. The Pilates training tends to focus on body-mind coordination, work life daily activities, physical changes, personality, personal growth, emotion, and energy(Hawkins, 2004). The training programs motivate trainees to participate in the progress of their body function, which is specific for each part of the health benefit. The outcome of the Pilates training is the development of the dynamic physical control, the assurance of the appropriate muscular movement, and the balance of the skeletal working system at the "Low back-pelvis-hips providing either gentle strength training for rehabilitation" (Kloubec,

2005).Furthermore, Pilates is well-known as an active exercise that helps learners acquire more body strength. Previous research illustrates that Pilates exercises benefit vocalists not only to avoid the injuries but to help them prepare proper active inhale and maintain good posture that reflects the sound quality (Asher 2009). Also, these documents bring up specific and necessary common principles of Pilates breathing to integrate the process of body function that produces the sound quality of vocal resonance.

1.2 Need for the Study

Most of the time, vocal instructors work very hard to remove the individual-false habits from students. For instance, breathing and body tensions cause unhealthy singing. The correct breathing is necessary for singers to project sound within one inhalation of classical resonation. Vocal chords are moved and vibrated by the force of air(exhalation), muscle and larynx move for phonation in the mouth region (Markovic, 2002). Most importantly, voice instructors need to deliberate the complex problems that students confront, and assist them with theoretically and practically pedagogy to fix the problems. The Young Artist's programs at College of music, Mahidol University, found common technical problems with classical voice students. Many new learners struggle with uncomfortable body alignment and vocal agility control. In fact, they learn in different contexts, languages, and historical music knowledge. All these make it harder for students to feel comfortable enough to allow themselves to sing effectively. Most of them lack inspiration and capacity, and use the wrong muscles to support singing. The problems indicate that they cannot breathe and lower the diaphragm to expand the ribcage to allow intercostal muscle actions, which control the vocal range and quality. The investigation of common problems found that they had a lot of tensions at tongue and jaw, and lacked active-breathing techniques. Moreover, there are problems with language difficulties, consonants, vows and dictions. In addition, the most notable problem in male is the voice register in middle and low voice, while in female is the middle and high voice (high larynx position) (Subhakarn, 2013). Moreover, the researcher concluded that the Kinematic function is the main function to mobilize vocalizations. For instance, Chest wall kinematic

behavior expands ribcage and releases the air. However, this method does not agree with the idea of breathing support in voice classical singing concepts. Furthermore, the voice studio classes, which employ the abdominal wall and expanding ribcage (Chest wall), reduce vocal folds and sternocleidomastoids straining (Miller, 2004). The scientist indicates that proper breathing helps intercostal muscle to work effectively and beneficially for singers. This, however, does not mean that proper breathing does not harm the vocal chords. The most important thing is to not use too much effort in muscle contraction (Markovic, 2002). The researcher found that the palates respiration is similar to the vocal breathing pedagogies. Adult palates are used to improve the posture and respiration through the body kinematic function. The core capacity after exercises shows that proper posture helps singers be ready for their professional field (Kloubec, 2005). Torso Pilates program: for Adult, The journal of Voice and other physiotherapy journals also puts forward relevant information that can be applied to highlight the importance of posture and breathing in Pilates breathing technique in the vocal training. Nonetheless, more reliable research is needed with practical methodology and evidences that can verity the findings of related studies. Several techniques and pedagogy of voice instructors help students sing better, yet focus is not placed on the main element, which is the “breathing.” Breathing is a main component of voice production. The deep inhalation is the preparation for singers to sing, while diaphragm, thoracic, and abdominal muscles increase their activities, then body will work through the respiration system. To hold the phrase until the end, the vocalist needs to manage the breathing to sustain the musical line by using the air pressure release, phrase duration, and onset (Miller, 1996). Additionally, proper respiration is the principle singing preparation that affects the vocalists’ gesture. If singers focus on the right muscle groups, they should be able to hold the notes and sound effectively (Manifold, 2008). The study demonstrates the importance of relationship in deep respiration, which engages pelvic floor and respirational muscles, with transversus abdominis allowing the body to adjust proper alignment for singers. The study also helps beginners to release the tensions and gain supporting muscles. The larynx mobility and cervical stability are very essential for beginners to study classical singing. That is, decreasing sternocleidomastoid and scalene muscle functions and increasing the longuscolli-muscle function of thoracic and cervical spine allow one

muscle to be engaged and contribute to cervical stability. Also, body alignment will adjust into a proper position (Staes, Jansen, Vilette, Coveliers, Daniels, and Decoster, 2011). The importance of this passage is the process of “Physical Therapy as a Means to Optimize Posture and Voice Parameters in Student Classical Singers: A Case Report” (Henrich, 2010), which collaborated the Pilates function. The function assists students in preparing their body to be aware of the respiration and stimulate their muscles. The results have been successful in helping students’ body relax and be able to perform accurately on pitch, tonal, and dynamic of composition requirements. The voice projection in the “high sound level” is certainly important for classical singers to keep sustaining the range. Particularly, this is crucial for classical singers who sing in acoustic auditorium and perform outstanding form of orchestra (Henrich, 2010).

According to the previous studies, the results show that respiratory system is an essential mechanism to help singers improve the voice quality. Thus, this research aims to investigate the breathing system. The researcher perceived and eventually reflected the Pilates breathing techniques to apply in this study. The related studies support the Pilates method, which is potentially important to the vocalist’s physical improvement. Connecting physical features to the mind helps singers gain awareness while they perform on state. Additionally, Pilates is essential for vocal training and improves the strengthening of the muscles, mental consciousness, and body flexibilities by clinical experiments (Asher, 2009). Not only does Pilates improve breathing, but Pilates also develops body and mind awareness, which allows singers to apply techniques and focus on breathing while singing (Melton, 2016).

As mentioned above, Pilates method is very useful for singing. Unfortunately, there has not been adequate study on Pilates respiration that benefits classical voice performance. Therefore, this study presents in-depth details of Pilates respiration that help the researcher clarify and realize the effectiveness of applying Pilates respiration technique to classical voice performance skills of two students(single-case study), which are used to examine the outcome of this study. The results of this study will definitely benefit vocal trainers, students, and other researchers who are involved in this field. They will be able to develop intervention strategies in other vocal genres.

1.3 Research Purpose and Question

The purpose of this study was to investigate the effectiveness of Pilates respiration-based classical vocal technique on student vocal performance skills. This study sought to answer the research question: Does Pilates respiration technique enhance classical-voice performance, which includes breathing management, phrase duration, intonation/ pitch, and tonal quality/ interpretation, of the students?

1.4 Definition of Terms

Pilates: Pilates is a practical use of body and mind connection. The method helps learners to balance physical movement through engagement of exercises and breathing. Pilates breathing contributes to the body movements. During the movement, inhalation occurs with muscle extension, and exhalation with muscle flexion (Hawkins, 2004).

Pilates respiration-based classical vocal technique (PRBC): Pilates respiration controls the air volume and the depth of the thoracic cavity. Diaphragm is pushed out and dominates the abdominal muscles and pelvic floor muscles. Moreover, the study supports the effectiveness of Pilates respiration to improve active stability for inhale and exhale (Isacowitz & Clippinger, 2011).This study also presents the procedure of the application of Pilates respiration techniques in classical voice lessons. The elements of Pilates respiration-based classical vocal technique include lateral breathing, diaphragmatic breathing on neutral supine, pelvic floor muscles engagement, and exercises.

Classical voice performance: Classical voice performance is the ability of the singer to sing acoustically with body resonation. In fact, this requires precise control of pitch as singing requires understanding and interpretation of vocal musical repertoire, such as resonance tuning, body controls, musical, historical and theoretical skills (Striny, 2007). In this study, the classical voice performance refers to the performance of students that include the criteria of breathing management, phrase duration, intonation/ itch, and tonal quality/ interpretation.

Single-case study: A single case design is an accurate methodology that represents the outcome of clinical treatment and phenomena. When the treatment or

intervention is stimulated, the outcome is examined by the observers, which comparing the performance change through the dependent variable(Nock, Michel & Photos, 2007).This method investigates between treatment conditions and the control conditions (baseline), which make observers confident about the hypothesis. In this study employed the simple case-study AB design that starts with the baseline phrase (A) and follows by the intervention phrase (B).The visual analysis of this study appears as dependent statistical results. The method is flexible to allow intervention of individual cases to adjust the strategy to assist the music stimuli procedures.

CHAPETER II
REVIEW OF RELATED LITERATURE

This chapter presents the background information of this research, followed by in-depth information on the review of related literature. The contents were organized into three main topics: 1) the principle of classical singing, 2) the principle of Pilates and singing literatures, and 3) the developing of rubrics assessment.

2.1 The principle of classical singing and pedagogy

2.1.1 History of classical singing

Classical singing is a combined art form, consisting of music, dramatic story and literature that reflect the imagination of the composers and the versifiers. Opera artists have roles to perform in using highly sophisticated abilities, such as music reading skill, expression, characteristics, and individual esthetics. To sing classical music, singers need skills, along with healthy vocal performance, and personality (Sandgren, 2005). Opera represents the diverse dimensions of the art form that consist of dialogue, acting, costumes, scenery and action and music. The elements combine into a powerful message that makes people feel the dramatic expression of emotion. The elements of musical form are represented; first, overture music that leads the people's feeling into the story. This is followed by a conversation that is sung along with basso continuo of performers called recitative. Next, the instrumental expressions that are accompanied by an orchestra to drive the scene's structures. The chorus group may corroborated by other characters that support stories. The most important part is that of the main character, or soloist, who leads the dramatic tone and mood of the overall performance (Fisher, 2003).

The beginning of opera moved in many directions, which were influenced by many artistic currents. Throughout the sixteenth century, opera

experienced a revolution. Prior to this time, all music served the church. The Florentine Camerata, were group of humanist musician poets in the latter part of the Renaissance. They were the group that tried to improve all the technical problems in music elements and worked to develop new ideas and put those ideas into practice. Consequently, the diversity of the sixteen century arts impacted into the musical forms and directed the opera's development (Langridge, 2004) Research found that music used in the poetry's recital. At that time the poets and musicians cooperated to develop new ideas to produce the art forms of music and poetry. For example, they experimented with the strong accents of vowels and more arousal tones and beats. The Academie de musiqueet de poesie founded in Paris, 1570 was one important group that started these experiments. This society has been recognized as the originator of the French recitative; the main composers were Claude Lejeune, Jaques Mauduit and other composers (Robinson, 1967).

Baroques opera appeared as an extravagant drama. This type of opera provided a vivid depth of scene and staging perspective to allow the audiences to get closer to the action. The French Baroque "bizarre", was applied to refer to a style of luxurious architecture in Germany and France during the 17th and 18th centuries. This word was similar to the French word "Rocaille", which means "Fancy rock-work," which was one feature of these buildings. These two words have been used to express the music in Rococo's ornamentations and styles. The great composers that followed this style were French composers; "Franccois Couperin (1668-1733), Jean Philippe Rameau (1683-1764) and Johan Sebastian Bach (1735-1782) from Germany. Their compositions were developed with much more complexity and with the vertical contrast of textures and harmony, chord progression, dynamism, and articulation. For instance, solo voice, chorus and orchestra showed more contrast that demonstrated a combination of each element (Bourne, 2008)

The method Bel canto (Beautiful singing)was invented to help the singer to sing effectively on the art songs, oratorio, cantata, recitative and opera. Bel canto technique helps singers to sing effectively through pieces. Since the medieval period, singers have been trained to meet the tasks, which included musical phrases that connected to the next sequences. The musical elements were sustained with vivid ornamentation that delivered the new era of Baroque expression. Bel canto was first

used by the Italian composer and singer, Nicolas Vaccai before the year 1840. The Baroque era required singers to be able to sing using the new techniques that related with vertical harmony, countermelody and articulations that were used in this type of periodical composition. Singing vibrato was needed in order to provide the depth of musical expressions; however, whether singing as a group or solo vibrato was not a certainty to be added this in all phrases, in the Baroque style. To control of using the technique of vibrato, known as "Intensity vibrato," this was often used at the cadenza and at the end of musical phrase (Langridge, 2004). The characteristic of music was presented as sonata and concerto grosso forms and developed more on the Baroque composer's works; particularly, in Bach, Handel, Corelli Vivaldi.

It was important to understand the vocal classification in opera at that time, because the composers tended to compose the opera for the particular artist to demonstrate the role of each character, which depended on the range of his/her performance ability. In baroque, bass tone or deep chest voice was designed for bass parts. The higher tone deep chest voice was presented by the baritone voice, but was not be separated as different category. Similarly, in the female voice, deep chest tone designed the alto (contralto) part that were usually sang by mezzosoprano, or sometimes the soprano part sang by mezzo-sopranos (Bourne, 2008).

Research regarding breathing in bel canto techniques does not revealed the type of reliable sources we normally look for; because, in early Baroque, the Maestri was secretive about their knowledge in breathing and singing techniques. The early Italians were inspired to use a method called "appoggio," from appoggiare (to lean, to support). The Italian voice instructor claimed that this method involved inhaling into the chest cavity and "leaned up against the inside of the chest". The appoggio is very crucial process for overall methods, especially the head and hard palate resonation. Giovanni Sbriglia stated that exhalation naturally is better while singing. This method teaches student to breath properly and could enable the student to sing "filarilsuono spin the tone out". For example, sing from piano and louder to forte and then return pianissimo, or singing continuously or pausing sound with consonants etc. During 1880, a teacher named Garcia indicated that vocal resonation needed to take a full slow inhale which would be much effective than hurried. This inspiration led singers to focus on inspiratory muscles and contraction while breathing and expanding their

ribcages. Miller (2002) explained that the Italian school teaches students to inhale by lowering the sternum and subsiding the ribcage and engaging with diaphragmatic function. The diaphragm is a dome shape in natural position, while inhale thoracic cavity at front and back muscles expand, the contraction caused the diaphragm flatten out. The process caused the singer to feel the sensation of breathing lower to the abdominals (intrapleural pressure and atmospheric pressure); because, the air volume filling into lungs. The bel canto exhale method is to actively circulate out from lungs, with the volume of the air pressure of high capacity but the air volume also impeded to allow glottis close and sing. The singing musculature allows the air volume to release then internal intercostal muscles that band the ribs altogether. Additionally, transversus, internal and external oblique and abdominal muscles pulling downward allow the breath to work on phonations (Merek, 2006).

2.1.2 Vocal pedagogy

Richard Miller categorized the characteristics of four school methods; these are Italian, French, English, and German. The differentiation of each school from the rest are vocal component, breathing technique, vowel modification, voice registers, and vocal adjustment (Ware, 1998). The voice pedagogy is the method of helping students to learn vocal terminology and musical art; which importantly included scientific and aesthetics. The scientific cognitive delivered the body awareness, that helped the vocalists understand their own body and be able to use it well during learning procedures. The pure science in voice included anatomy, mathematics, acoustics, and linguistics. The learning of classical-voice may require almost aesthetic interpretation as overall procedure, but, the artistic and scientific need to focus as parallel procedures to achieve of learning implementation (Appelman, 1986). When teaching voice, the teacher needed to understand the student's physical conditions and biological development, in order to analyze what type of teaching program is proper for a certain age. For example, it is important to understand that the larynx is started emerging at the third month of embryo, larynx develop through the physical condition and development; infancy, child, puberty and maturity. The development of larynx turns the shape of vocal fold longer and tightening the

laryngeal structure during maturation and caused lowering down the voicing frequency (Ware, 1998).

2.1.2.1 Vocal training

Singers have various procedures during performance. These include breathing, voice resonation placement, song interpretation, vibrato, vocal folds tensions, relaxation, and muscle control etc. Individually, each person has a different tone and way to use the technique to each intonation and vowel. In contrast, even when two singers have similar range and tone quality, some might use different techniques to project the sound; some techniques might focus on lifting the soft palate and might be expanded by abdominal muscles and relaxing (Appelman, 1986). To contribute the sound which resonance projects, singer could interpret colors of sound that have different shades and dimensions. The most effective way to start with is to let the air come out naturally but active and no training with collaborating group of muscles (Markovic, 2002). Singers began to realize that they could resonate sound with different placements, For instance, while a soprano may sing in the lower register of alto range she might not feel comfortable to sing in lower ranges. However, this range may be needed the in many repertoires of sopranos. For example, consider Caro mio ben (Arietta, Giuseppe 1743-1798). The last four bars that vocal line ended; G-F-Eb-Eb3, in this range soprano might feel uncomfortable if they never been trained to sing chest register and combine the tone to head voice as shown in at figure 2.1

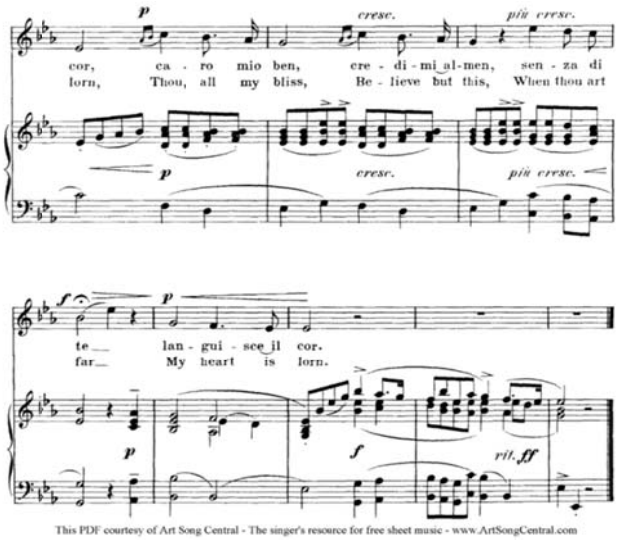


Figure 2.1"Caro mio ben" (Arietta, Giuseppe 1743-1798): www.ArtSongCentral.com

2.1.2.2 Vocal onset

To start singing in any tone or expression, the singer should keep in mind that how they are going to prepare their body. When commencing to sing the intense rhythmic, a singer may prepare to use a glottal (hard) onset, while others use an aspirate (soft) onset for the loosen of articulating expression. Balancing of necessary muscles during singing may help the vocalist to sing more comfortably with "gesture of the inhalation." They prepare for singing by opening the throat and lifting the soft palate with an easy sensation. This vertical action widely opens the cavity, which makes the arch of resonating formant. Due to enlarging the resonance chamber, the singer needs to prepare to stretch vertically on throat and to lower the larynx. The experts recommend that vocalists always use air pressure in starting onset phonation any type of vocal tone release.

2.1.2.3 Vocal agility

To sing coloratura passages, fioritura, staggato, or legato articulations, singers need to learn how to adjust their muscles activities. Vocal agility and sostenuto mainly coordinate by synergism of torso muscles, the balancing actions included the breathing, and intrinsic muscles of larynx adjustment. Singing proficiently requires the repositioning of the diaphragm during expiration. Delaying the release of air pressure is required for singing, and this delay needs flexibility and healthy muscles. Rigid muscles may cause unnecessary tension, and that would affect air releasing pressure. Thus, voice resonation needs both firm and flexible muscles. However, this balancing will need several practices to allow singer to feel comfortable and get used to it. The subjective recollection requires abdominals resistant with firming energy while singing agile staggato and legato. The consistency of the air pressure drives the larynx to generate the precise pitch and ringing phonation in head chest cavities. Thus, the vocalization mechanism depends on systemization of the expiratory and abdominal musculature insistent (Miller, 1996).

2.1.3 Phonation

The study found that the larynx is the principle organ that is developed and assists humans to breath, eat, and speak. The human larynx contains five cartilages

and muscles. The variation of the voice characters and vocal capacity of each individual are different. The larynx mechanism includes muscle structural memories. Masculine procedure of phonation can specify the basis of sound production. Vocalization needs the multi-muscles to experience multiple practices to allow the body to feel the multi-coherent as a muscular-sensation action. The tones are produced by the vibration of the thyroarytenoids muscles, but the thyroarytenoids cannot produce sound in all ranges. The synthesis of singing phonation refers to the fact that respiration is the originator of human voice witch produced by laryngeal and related musculatures. (Appelman, 1986). Additionally, the inhalation suspension of the air pressure by holding the inhalation position, the singer retards the breath cycles, which are; inhalation, exhalation, and phonation. This process requires the air emission to activate the laryngeal adjustments into the cavity-pressured degree as following by the ascending of the subglottic pressure (Miller, 2004).

2.1.3.1 The action body musculature

-The setting of thoracic muscles

- The viscera (coccygeuslevaresani) is maintained by the pelvicdiaphragm contraction.

- The contraction of abdominal diaphragms assists the middle torso and condenses the visera. The other muscles that are correlated are the serratus superior, serratus inferior, quadratus lumborum, pectoralis major, pectoralis minor, and latissimusdorsi. These muscles function within the elevate anterior, posterior, and vertical diameter of the upper abdomen and thorax. They allow the air to compress in lungs needed to expand intercostal spaces. Sphinctericis the action musculature exhalation (closing a circle), viscera compresses instantly and equalized all the related muscles (Appelman, 1986).

2.1.3.2 Action of laryngeal musculature

The researcher found “an aero-dynamic theory”, that the breath pressure and cavity resonation are more effected by “frequency and intensity” than the muscular or nerve system. Due tothis, the thyroarytenoids work hard to hold the long consistency pitch and this can cause more tensions and weary on the muscles.

Moreover, cricothyroid muscle was contracted by correlated with thyrorytenoids function, which is vocalization (Appelman, 1986). In addition, while the singer is lifting up the face and chin, it elevates the base of tongue which shortens the vocal track and it falsifies the voice quality. The three organs that caused inaccurate-voice function are tongue, jaw, and neck. Because, while the tongue is lifting, it also elevating the larynx which effected the hyoid bone and larynx system (Miller, 1993).

- Arytenoid functioning the glottis respiratory closure, and itis connected to lateral cricoaryteniod muscles.

- Vocalization is related to the lateral cricoarytenoid muscle that is anticipated with the midline of glottis-vocalist closure.

- Posterior Cricoarytenoid and lateral Cricoarytenoid muscles involved the Aryteniod cartilages function.

- Cricothyroid, thyroarytenoids, and circoarytenoids incorporate with increasing of vocal-fold elasticity.

- While increasing of vocal-fold elasticity, the folds are rising and separate in sound waves that are forced by the air volume. The breathing volume releases through the conical; as the wave travel upward (Appelman, 1986).

2.1.4 Voice register

Registration is the vocalization that is produced by the phonation and resonation processes. Basically, voice register has a combination which consists of "distinct, consecutive, and homogenous vocal tone" and it delivers tone and pitch in a proper ranges. The components of phonation included vibration of vocal fold, glottis, air releasing. This is the origin of pitch as known as frequency of vibration.

The components of voice resonation combined the subglottal and supraglottal systems to the larynx, and this functions governing vowel, and timbre sound as known as harmony spectrum. Tone quality combines with the artistic singing and singing experience with which the singer has memorized all muscles' mechanisms. The register is important to the singer so that they can sing in diversity ranges and produce dynamic quality. Generally, the singer will register their sound to adjust the vocal ranges to fit into the song. Often, singers have some difficulty with singing low pitch to high pitch, or singing with over-used voices (Ware, 1997).

2.1.4.1Short summary of vocal registers

- Glottal fry is the lowest pitchesin the register range, the soundis airy and no vibrato, withrelaxed the cricothyroid muscles.

- Modal voice is the register type with the cricothyroids and thyroarytenoids muscles engaged simultaneously.

- Chest voice is the heavy tones, the thyroarythenoid muscle dominates this function. This causes vocal folds which are shrunk and thick.

- Middle voice is balancing tone, the muscles of thyroarytenoid and cricotenoid functioning connected and the engagement of the dynamic equilibrium.

- Head voice is the light tones, the cricothyroid muscles dominated the voicing and stretched vocal folds to be thinner.

- Flasetto/flute is an ethereal-quality production, only circothyroids are contracted while vocal ligaments merely vibrate.

- Whistle is the shortening of vibration length, the cricothyroids are absolutely connected and the thyroarytenoids releases the tension. The pitch is created by moistening at the back of vocal folds (Malde, Allen & Zeller, 2009).

The voice Terminology describes the vocal placement that Chest Voice - the lowest register (region) of the voice; the register below, Falsetto - in the male, an artificial way of singing and voice resonate in a much higher register than of the natural voice. Head Voice - "the upper register of the voice above the break" (Bayerkohler, 2002). The voice register in the male category commonly has Passaggio modification between head voice and chest voice. Practically, terminology operates with the assumption referred that basses normally sing chest register, and tenors are singing chest register until F_4 or $F\#_4$ and passing to mostly head register in upper ranges of $F\#_4$ or G_4.The first register transition is the most comfortable singing range because this range as same as the speech ranges. Most adolescent male singers or untrained singers will lift their chins while singing, and the sound volume rising in the chest register but laryngeal were lifted. Secondo passaggiois the vocal range that located between chest and head resonation (middle range). The zona di passaggiois

the head resonation in the upper range, at this range usually used only by a trained-tenor voice.

With the voice register in female category, there is some misunderstanding about the falsetto, that every ranges is singing in chest. The terminology states that female falsetto is how males singing using their head voice. The upper ranges of female soprano could not be imitated by male singers. (Malde, Allen & Zeller, 2009).

2.1.4.2 The three type of female speech voices;

There are three types of female speech voices. First, they usually speak at head and rarely using chest voice. Second, they using both head and chest for speak with but with the sound dominated by head speech. Thirdly, is principally speaking with the chest. This is the example of voice used preference, which made the female voice different. Soprano voice does not need to sing chest register for the coloratura, but it does need to add the degree of singing chest voice in some ranges. The female singer could modify the passaggio by changing the chest register to head register in low range. But female could not shift chest register to head register in middle voice. On the contrary, a male singer could do so, passing through falsetto.

There are many varieties of range in the soprano voice from "coloratura to dramatic." The character in the dramatic soprano voice is more similar to dramatic mezzo soprano than the "light soprano" sound. The chest mixture is mostly used for timbre that allows the singer to sing in the low range (contralto) and middle range (mezzo). Sopranos will use a chest mixture to sing in range that below E_{b4}. The head mixture was originated by laryngeal action; in lower pitches the head mixture has less sensation than chest mixture. Head mixture in the middle range should be developing constructively from low to high pitch. Sopranos should carry the voice middle chest register until E_{b4} to $F_{\#4}$ and should not use the chest mixture for higher pitch, because of vocal safety concerns (Miller, 1996).

2.1.5 Sound and analytical process

Classical singing has a special sound that can be extremely loud if the singer can reach the higher voice registers, considering the quality of the head voice that is projected. Singers should start to learn and practice daily the use of the body to adjust the onset of classical vocalization. There are soft onsets, hard onsets and balance onsets. The technique of vocalization brings the body to prepare the alignment of the muscle that is related. "The action-Potential aptitude rise before phonation, both in the crick-thyroid and in the vocal muscles. This means that the intrinsic laryngeal muscles assume the position and degree of tension necessary for production of the tone of a certain pitch even before actual phonation" (Millers, 1996). The phonation production involves collaboration among the larynx, vocal fold, abdominal and intercostal muscles. As the body becomes an instrument and produces sound from throat, singers might not know that their vocal folds are working. In classical vocalizations, the method helps singer to sing with natural exhalation that helps them project the sound effortlessly. The system of respiration that makes the body to be in unity and allows kinetic functions to drive the sound that the singer can control and sing. While the singer inhales, the muscles and ribcage expand, working to force the movement of the diaphragm, and the singer has to feel free to exhale with relaxation. Due to the volume of the air in lungs decreasing steadily, the diaphragm contracts to the thoracic cavity. This causes the internal and external oblique to return to their natural positions (Appelman, 1986).

2.1.6 Vocal resonance

Vocal resonation is the most vital sound to singing in various styles. In opera, singing has a wide range of shape in the vocal tracts, which collaborate by body and mind control and other adjustments; for example, the jaw, lips, larynx tongue, and musculature. The resonation action is cultivated by the vocal tract that resonates to the resonating chambers. The aspect that helps the singer to produce their resonating shape is to control the movable organs that are connected. For the constriction of the pharyngeal, the singer will have to control the back of the throat. Next, the singer must elevate soft palate, open throat wide, drop the jaw, and move it along with vowel change, relaxing resonators and moving freely with larynx. Moreover, the singer has

to balance the head position on the atlanto-occipital joint by lifting the chin up strait. To provide acoustical sound, the singer will need to drop the larynx and use connected muscle to hold the formant. While singing, the singer should remain the relaxation of laryngeal position. This action should place the larynx in the correct position. To develop the vocal resonance, the singer needs awareness to concentrate on the important musculatures that are related to the vocal tract. The most important thing is to balance the body and relax through the exercise and performances (Malde, Allen, &Zeller, 2009).

The vocal tract has a shape and length, that make it unique infrequency model. The sound will be enhanced when resonance frequency has been produced by the vocal folds' vibration. There are many frequencies that are produced by the glottis. The singing voice consists of complexion-resonance frequency. The vibration of natural frequency is required the air cavity to vibrate. The size of the cavity determines the pitch ranges; for example the bigger of air cavity, the lower of pitch range. The higher the frequency, the smaller the air cavity. Trained singers can shape their voice tones, pitches and voice characteristics with singing modification. Singing chest voice, the singer sings through the ribcage with forced vibration. However, the chest and subglottic system will limit the singer for enhancing the tonal quality in the high range. To enhance the voice resonance, the singer needs to understand vocal positioning. Singers shave to know their voice position, so they can use the right technique for each tone. There six important positions in vocal shape; laryngeal positioning, tongue positioning, pharyngeal positioning, soft palate positioning, jaw positioning, and lips and mouth positioning. Voice placement is needed the as a part of pedagogy and acoustical development (Ware, 1998). Wolffe, Gaeva, & Smith (2009) stated that acoustic impedance of vocal formant needs a significant amount of air volume. The glottis was constricting narrower and shorter while frequency is higher. The frequencies required that the mass volume of air capacity that input flow within the force acts in the glottis area. To enhance these processes, the singer needs to learn about the sensation of vibration frequency. Vocalization is the wider term. The singer needs to use voice positioning and to identify localization. For example, when singer is placing the head tone and keeping the consistency of tonal quality, the sensation of jaw positioning will lead the singer to relax the cheeks and mandible, then swing the

jaw dropping position. Moreover, the soft palate positioning that consisted of hard and soft palates, while elevating soft palate the vocal shape will contribute the tract configuration by focus on shape and dimension of sound.(Ware, 1998). Thus, the quality of voice resonation concerns the air volume that singer needs and an awareness to prepare their body to get breath support before they start to sing in any musical phrase.

2.1.7 Bodyand posture alignment

Most of the time the, the singer uses the whole body to sing. There is the long term investment to prepare the body's capacity to be ready to perform as character roles. Generally, a healthy vocalist requires; firstly, setting a goal and the each period's objective. Secondly, standardizing the efficiency techniques and musical interpretations. Thirdly, prioritizing the schedule and committing to hours of practice and training. Finally, to improve the physical condition and muscles' capacity to contribute to the body and mind's energy, in order to improve and give a good performance. The muscle function will accelerate the vital energy and build strength. Physical exercise is an option for the singer to be able to control the muscle movement and reduce stress. The body structure is stabilized by muscles, ligaments, and tendons. The nervous system is the central control of the body's movement. The muscles used in singing also need to be used repeatedly until they serve effectively. The most essential exercises for vocalist are the coordinated muscles of the core, or torso, especially the middle and low abdominals, and thoracic area (Ware, 1998). To help singer sing properly, it is important that they understand their own body and control it. The body balance is the principle method to achieve the classical-singing task. The benefits of posture alignment are relaxation, muscle balance, breathing comfortably, tone quality, and concentration and expressiveness, There are six places to balance in the posture; A-O joint, arm structure, Thorax in relationship to lumbar spine, hip joints, knee joint, and ankle joint. To allow kinesthetic flow, the vocalist needs to visualize the way to move those "six places", that helped them keep the healthy voice and fluently express their musical ability (Malde, Allen ,& Zeller, 2009).

1) A-O joint balance; the top-atlas and is connected to the occiput skull, the head is supporting the weight by atlas to the spine. Balancing

A-O joint is important to release the tension between head and body and allow the person to sing freely. Moreover, allowing kinesthetic movement is affecting great results while contributing the highest range of singing voice.

2) Arm structure balance; resting the body is needed to balance muscles and skeletons. The connection of the thorax and lumbar spine is essential to balance arms; the collarbone, shoulder blade, upper arm bone, two lower arm bones, a wrist and hand. To balance the arm structure, vocalists try to practice by lifting shoulders until close to the ears as much as they can, next try dropping shoulders to neutral position with relaxation.

3) Thoracic balance; the thorax is located between the neck and the diaphragm, and along the lumbar spine. The thoracic cavity contains ribs, heart, lungs, diaphragm and lumbar. A Singer may occasionally tilt the thorax forward during singing, and also tilt the thorax backward to pass the pressures on the lower back.

4) Hip joint balance; The pelvis is connected to the upper part of the body and supports the weight to legs. The pelvis contains two bones, at the top of it is something called the iliac crest. The singer should be aware of their posture by mapping the hip joints, so that the weight will be expanded through spine and pelvic area while sitting to practice. The mapping of the torso is essential for moving freely without tensions. This including respiration, body gesturing and bending forward. During singing, try to bending forward at hip joints by keeping the upper body (torso) in one unit, then try to balance the movement of hip joints while sitting or standing.

5) Knee joints balance; the functions of knee joints are locking, balancing and bending. The knee joint will be locked if the upper part (thorax) goes too far backward to the lumbar spine, so the body will not fall. You can map to balance the knee joints by bending knee, then feeling the thighs support weight and trying to balance the related musculatures. Next, try bending again and finding balance the connection between upper body (thorax) and lumbar spine.

6) Ankle joint balance; the ankle joint bone received the weight from legs (tebia and fibular). Balancing ankle joint bones need mapping on the upper part from head downward to ankle joint. First, balance the A-O joint, then map

the relationship between thorax and lumbar spine. Secondly, balance the weight on the hip and knee joint, then get ready to map on to the ankle joint (Malde, Allen, &Zeller, 2009).

Balancing the posture is beneficial for a singer, so that they can adjust can try to relax while performing. For singers, the body is as an instrument, and the quality of sound is dependent on their physical condition. The vocal athlete has been mentioned to compare to other sport players whose body must be ready to compete (Ware, 1998).

2.1.8Active respiration technique affect on sound quality

Singers should understand their own body, that how it systemize themselves during performance. Singing through throat straining can make sound came out hoarse and can lead to an unhealthy voice. Thus, singers need to use the chest register mixture to help equalize the sound resonance in order to sing through throat without tension(Coffin, 2002).According to this statement, students should be learn based on the own natural characteristic of their own voice. Some may sound harsh, raw, or with a robust shrill voice, and the teacher will have to integrate the techniques to adjust to help student to learn resonating their voice. There was only one way to help student to reach the higher standard of carrying the note and make the proper sound, “to exercise (whole notes) rendered with repose and taken one by one with due graduation”(Coffin, 2002). In the lower to the middle range of male and female voice, the sound should have to come up to the head cavity by lifting the soft palate and point the chest resonation that to helps the lower register by lighting up the sound (Lehmann, 2009)Body acoustic mechanisms associate with well controlled vowels and can easily control the pitch and tuning. Body alignment is the key for singers to achieve the success of making the proper acoustic sound. As result, it is very important for the performers to prepare themselves to inhale with not too rush and exhale with natural flow, but not lose to use the support of muscle to steady the resonance of sound. “Without exaggerated respiratory activity the tongue is relaxed in the mouth”(Miller, 1996). That may happen when the singer have a rushed breathing within a second, because, to breathe in a big amount the air volume too quickly can cause tension from neck and try to expand the ribcages. That may awaken the body to stress especially

surrounded internal muscles, external oblique muscles and abdominal muscles. As for the gesture of singing while breathing: Giovanni Batisst Lamperi states that one should “sing on the gesture of inhalation”, due to subglottic pressure being released asair volume for lung, then while singers sing they should allow the air come along with the word, articulations expressions and not breathe and over-exaggerate making inhalation and exhalation phonations (Miller, 2004).

2.1.8.1 Breathing Mechanism

The relation between diaphragm and abdominal muscles contribute to the respiration cycle and motivate air flow. The breathing method for the vocalist should be considered as the primary mapping. There are three principal methods that a singer may identify and apply for singing; high torso, middle torso, low torso and middle and low torso (Ware, 1998).

1) High torso breathing; this breathing is neutral breathing but occasionally, deep upper chest breathing. For example, while we finished running and we need more oxygen to the lungs, so we breathing quickly but deeply with filling up the thoracic cavity. This breathing method does not apply to the voice pedagogy, because, it causes muscle tension and causes unsteady control.

2) The middle torso breathing is the method that allow singer to breathe deeply by expanding the ribcage mainly at the side and by causing the chest to partly move forward but not lifting upper chest and pull in the abdominals. This method does not related to the abdominal respiration; the breathing tends to focus on the high restrain of the air pressure that will cause improper vocalization, especially at high ranges.

3) Low torso breathing is the method of deep inhalation into lungs by lowering the diaphragm but relaxing the abdominals while releasing air pressure. Additionally, this method is used for practice in meditation, yoga and in the “German school”.

4) Middle and low torso breathing is related with the rib expansion and distending the abdominal muscle downward. This method combines the middle, low torso breathing techniques, and consists of expanding the chest with fully

breathing through the lungs and lowering the muscles to release the air pressure. This method is uses in the Italian school (Ware, 1998).

In addition, Miller (2004) stated that the breathing sustention should be exercised with rhythmic patterns or through sequences. The pacing can be the lengthened or shortened, depending on the design of the lesson that serves the music ornamentation and timbre. Moreover, the most important active respiration method should be silent breathing through mouth, whether slowly or rapidly.

2.1.8.2 The singing supports

In classical singing, correct breathing is essential for developing technical skills and vocal exercises, which are important for the singing instrument. If the singer understands the sensation of body-respiration system, they can be adjusted, balancing subglottic pressure, air-released pressure and laryngeal muscular responses. The singing support uses the systematic manner to build it up, and this support needs the respiration procedures as the tool. To build this action, the singer needs to control the speed of comfortable inhalation and the releasing of air pressure. Moreover, breathing control requires a high volume of sub glottis pressure and stable laryngeal duties.

The word “appoggio” is translated as “support”. The appoggio technique combines the muscle balance between the organs of thoracic cavity and neck as a phonation system. The appoggio-related inhalation cycle effects the action of the muscle in middle torso area (epigastric), lower torso (umbilical region) and diaphragmatic movement. The function of appoggio is mainly focused on the sternum, the high torso area must be balanced in order to keep the high sternum position. The high-sternum position maintains the capacity of respiration cycles. This technique focuses on the expansion of the trunk region, the movement of this position draws outwardly during inhalation, such as; the sternum and the umbilicus. Nevertheless, the outward movements must also be lateral, but this action is not related to the lowering of abdominal-wall pushing (Miller, 1996). The respiration muscles consist of the pelvic diaphragm, abdominal diaphragm, pectoralis major, pectoralis minor, latissimus dorsi, levatores costorum, serratus posterior inferior and quadratus lumborum. While the inspiration muscles are ruling the movement of the diaphragm,

the thoracic muscles elevate the pleural space and bring air through lungs. The expiration appears when the upper torso musculature and lower torso musculature move against the pleural cavity, thus, the movements create higher pressure within lungs than outside the body.

At the onset of singing it is very important for the singer to start with the correct sound, and correct singing needs a high volume of air stream. The vocalist must disciplinarily control of the movement of these muscles and balance the action of both inspiration and expiration (Appelman, 1967). Additionally, the study found that the base of the muscle forces is the pelvis. The pelvis supports muscles and protects the internal organs; moreover, it also supports the trunk muscles that reinforce the upper body and head. The pelvis is the region that contains the strongest muscles in human body. “The powering from the power base” is the concept of the singing that use the pelvic girdle as an engineering construction of singing because, the singer is breathing with the extension of legs and stand firm on feet, which is a standpoint of the singing production (Nelson & Blades-Zeller, 2002)

2.2 Classical voice performance criteria

The performance criteria in this study was the tool to evaluate the students’ vocal performance, which is classified into four categories as follows: 1) breathing management, 2) phrase duration, 3) intonation/ pitch, 4) and tonal quality/ interpretation.

2.2.1 Breathing management

The appoggiatura system is the breathing management method that applies the coordination of muscles and respiratory function into phonation. The breathing mechanism includes the sterno, costal, diaphragmatic, and epigastric actions (Miller, 2002). The more air volume, the more free expression in vocal resonance; owing to the fact that when the singer uses more effort in inspiration, the singer will use far less effort to sing with naturally flow. Additionally, the singer needs to understand that lungs are the power source that allow them to sing effectively in all

ranges. This is because the lungs act as empty sacs and while the singer is opening there aspiratory function, the lungs expand in six directions first, when the belly and ribcage move forward. The second direction is when the spine lengthens, with organs moving backward, while the ribcage expands. Third is when the abdominals and ribs expand into the left and right sides. Four this when the scapula and clavicle elevate up, and finally when the pelvic girdle lowers outwardly and slightly expands to the hips (Nelson & Zeller, 2002).

2.2.2 Phrase duration

The inspiratory system is the principle system involved in singing phrases. It is necessary for the singer for pacing through the musical sequences because, the inhalation system takes control of the air volume that is released form the lungs and that engage the with diaphragmatic movement and ribcage expansions. The upper and lower torso muscles engage those systems that control the capacity of full breath within the lungs (Miller, 1996). The lengthening process is important to develop the singing suspensions. To retard the expiration is important for singing in the long phrase, which needs the abdominal musculature and trunk muscles to retard the movement of the diaphragm into its position. Thus, singers should be able to understand and moderate their breathing and sense there aspiratory system during singing preparation (Nelson & Zeller, 2002.)

2.2.3 Intonation/ Pitch

Voice resonation is the acoustic-quality sound of vowels or diphthong patterns etc. The singers can be archived to sing with head-tonal quality through several languages; such as, German, Italian, French, English, etc. Because, the more experienced in vowels and consonant adjustment, the singer knows how to express sound with several forms and can produce properly in several shape of pitches. Particularly, singers are always concerned about the consonant that shapes the vocal-resonator tract and consonance. Thus, the singer should learn more about singing registers that produce an accurate pitch that is involved with avoiding forcing tension into body (Miller, 1996). The vowel intensity has contributed the acoustic quality, and voice pedagogy has tended to be designed as the standard scales or

diversity of Italian or phonetic vowels to construct the acoustic ornamentation and timbre (Appleman, 1967).

2.2.4 Tonal quality/interpretation

In some terminology, it is indicated that vocal timbre should be analyzed on the vowel modification. The open voice (Voce aperta) specifies the resonance factors in any vocal ranges, that there are variances, especially in the upper-middle and upper register. The close voice (vocachiusa) interprets the balancing of low and high harmonic fragments in any vocal range. The vocachiusa presents the dimension and shape of voice timbre to be lightened and darkened in any voicing scales. The suonocoperto (voce coperta) is a “covering”, which is leading a hard thyroarytenoid function that takes part on the rising pitch. This method is found in primo passaggio but it does not balance neutral vowels into the secondo passaggio pivotal point. The voce coperta is related in method to vocachusa but evaded the vocaaperta method about vowel modification (Miller, 1996).

There are several methods to help the singer accomplish the musical task, but they find it difficult to interpret the vocal timbre. The “cultural conditioning” was mentioned as a timbre concept, and many techniques and styles were influenced by the “cultural preference”. The human body is the capable of freely producing sound while compared to other instruments. Singers need well-formed and coordinated bodies while producing the sound. The tone and the artistic quality is formed the by traditions that consist of story, norms, or the ideal contents. The vocal timbre concepts must correlate with acoustic nature and freedom of physical expression (Striny, 2007). Therefore, to produce a freely musical aesthetic, the singer must be heard the producing a sound that responds with muscles and emotional responses. Teachers should not only focus on the artistic expression, but also point out the insecure habits that caused the unhealthy voice of the student. Moreover, the student should be instructed to identify their physical issues and be able to discuss the technical strategies to address those issues during the private and performance classes.

2.3 The principle of Pilates and singing literatures

Pilates was invented by Joseph Hubertus Pilates. He was born in 1883, in Monchengdbach, Germany. He was the second child of nine in the family. Joseph was instructed about wellbeing of healthy values by his parents. His father was determined about fitness, and his mother instructed him with regard to philosophies. However, Joseph was diagnosed with rickets, asthma and rheumatic fever. Being challenged with all of these sicknesses, Joseph was weak but he tried strengthening his body by learning the about human anatomy and he explored western and eastern exercises. He has combined the Greek and Roman philosophy to his exercise and practice in sports, such as, body building, gymnastics, skiing, diving and boxing. Over the years Joseph trained others; military forces, policemen, boxers, self-defense students and those who had physical ailments. Joseph's methods were applied by Von Laban and combined with dancing, and his methods became well known in dance society. Due to the political situation in Germany, Pilates moved to the U.S. in 1920. He setup a physical training gym for boxers, athletes, and dancers near Madison Square Garden. His methods were very popular because of the combination of physical and mental conditioning treatments. Joseph invented about 20 exercises machines and received the first patent of gymnastic apparatus on March, 15, 1927, by U.S. Patent office (Rincke, 2015)

> *"All new ideas are revolutionary. When their underlying theory is proven through practical application, it becomes only a matter of time for them to develop and flourish. Truth will prevail. That is why I know my teachings will reach the masses and finally be adopted as universal"* (Joseph Pilates-1934).

Recently, Pilates became the constructive physical training programs, which included fitness classes, physical therapy treatment centers, in dancing school, in hospital, and sport centers (Wiggin, 2013). The mind-body is a principle concept of his cooperative exercises method. The methods helped balancing the posture by strengthening muscular and joint system. The benefit of Pilates was identified as having these essential keys:

- Body alignment (neutral spine): this method to alleviate tension on the muscles, that the work of muscles helps learner gain the muscles mass and release of tension. The key benefit of this system to contribute the proper bone structure, which is very important for movement and flexibility (Cooper, 2016).The vital systems supported by Pilates movements are spinal and muscular. This stabilizes the body control of movement of the exercise that benefit with increased flexibility and body strength. The function involves abdominal and spinal extension and contraction (Isacowitz & Clippinger, 2011)

- Strength: the concept of the body conditioning program in Pilates exercises focused on the body using the weight resistance of their own body rather using the equipment. The strengthening programs indicated into diversity exercises, such as, the movements of lying, sitting, and standing, etc. The key benefit of this treatment focused on improving the performance of the body movement, especially the dancer or athletes, in order to empower and strengthen the core muscles (Cooper, 2016).The key of Pilates training is that it helps learner gain their core strength and stabilization. The Pilates exercise focuses of using the core exercise before going to other exercises levels. The method is to develop the abdominal movement to strengthen the correlation of spinal muscles and the diversity-muscle actions (Isacowitz & Clippinger, 2011).

- Flexibility: the concept of flexibility is defined as saying that increased body strength needs flexible muscles and joints that combine the mobility function in order to use the body figure effectively without pain, tensions and injury. The key benefit of this concept is focused on the effective movement of body, which contributes the energy of movement and position and also helps by boosting of blood circulation. Moreover, this concept of exercise contributed by causing the related muscles and joints to move freely, and avoiding tension or pain during movements (Cooper, 2016).During the people’s lifetimes, they often experience the weakening of body movement. Pilates exercises help activate the body structure by strengthening the core muscles, joints, tendons, skeletons, and related musculature that stabilize the body structure and movements without stiffness and avoiding injury but improving body performances. (Blazevic, Vindulin, &Trakovski, 2015)

- Shape and tone: another benefit of Pilates exercises is that they help the learner to develop the muscles into shapes that they need to develop their posture; for example arm, legs, buttock, or core muscles (Cooper, 2016). In addition, the muscles will respond and recover faster, often just a couple of weeks after a workout. Because of that, the learner can be more energetic to move or react during daily activities (Marrithew, 2008).

- Endurance: Generally, most of the time people get physically tired from muscle activities; such as running, or climbing up stairs. Pilates exercises help be causing the muscle to work longer; because, individual work helps build the stamina, and by concentrating on self-body weight resistance, the muscles will be more strengthened after several repetitions (Cooper, 2016).

2.3.1 Pilates Respiration and training

The primary benefit of Pilates practice is breathing. To breath in Pilates, the trainee will learn about the function of the thoracic cavity and learn how to connect to the abdomen functions. Pilates breathing can supply the concepts of providing oxygen to the body and balancing the PH level in the blood and displacement of carbon dioxide. With the inhale, breathing through nose, Pilates respiration effects the diaphragm to slide downwardly during inhalation which allows oxygen to get through to the lungs. The shape of the diaphragm is similar as the hammock connected to ribcage and expanded the inter-costal muscles. The exhale allowed ribcages to be minimized naturally, the diaphragm shrunk and moved upward and engaged the related abdominal muscles to contract to natural positions (Isacowitz, & Clippinger, 2011).

Pilates training is an effective way to gain body strength. It helps the body to be flexible. The other benefit of the Pilates programs is to connect psychologically into body movements. The study presented the exercises that help core strength, which is abdomen training, establish lower back stability, and contributing to the abdominal musculature (Kloubec, 2005). The scientific studies proved that Pilates is effective treatment that helped patients improve their posture. It also helps body to stabilize the function of the movement, and the exercises help correlated muscles around the joints to be more flexible and to work properly. When each of the functions work properly

the body will also respond with effectively improving muscles, movement, and stabilized flexibility “Injuries usually occur because we’re out of balance,” Stott states (Asp, 2000).

2.3.2 The application of Pilates method and vocal performance

It is important to focus on breathing for singing preparation. Breathing is the energy source of the body instrument, as much as the brass or woodwind instruments need air. The consistent air flow is essential for tone quality in the singing voice (McCoy, 2014)The deep-active breathing is necessary for a singer to allow the air consistency flow out. “The sound of a great singer only requires a certain amount of breath”, “in great singing, breath becomes synonymous with sound.”, “No waste no tension: these are basic attributes of Head Voice sound production”. (Striny, 2007). To cultivate consistent air flow, muscles need to strengthen and stabilize the core muscles with flexibility. Pushing the abdominals hard can cause the muscles to become too tight, which effected the contraction on back and prohibit the expansion of the ribcage, causing the inadequate breath capacity for singing. Singers need the setting of vocal folds to cultivate the volume and pitches, and it is necessary to balance the low torso and coordinate with air pressure. (McCoy, 2014) indicated that the breathing, vibration, resonation and articulation system are working together during singing and that the air volume mobilizes these systems through the movements of vocal folds. Basically, a singer is breathing to exchanging oxygen into their body systems. Additionally, they are releasing air pressure into a phonation operation. Finally, they need to supply the voice tone with steady air flow to the epiglottis function (larynx). There is a complexity in combining the proper breathing techniques into singing or vocal exercising. Collyer, Kenny, & Archer, (2009) concluded that there were many factors that help singer to apply breathing strategy. The results show that there are very complex breathing functions, and that a general breathing pedagogy was not helping the student to understand the complexity of muscle functions, but there are other factors also needed; repertoire, exercises, and voice categories to contribute to the muscle memory and individual understanding.

The Pilates practice strengthens the core muscles that important to stabilize the respiration muscles to be more resilient. Moreover, exercising the

related musculature and stabilizing the joint of the lower spine, hips and pelvic area that surround the lower torso is also necessary for stabilizing the respiration function during the performance (Fliedlander, 2015).The study found that Pilates training improved the breathing and physiological conditions, that help singers to produce a good tone quality. During the "Pilates based exercises" that apply the breathing and body preparation for singing, opening laterally the ribcage expansion cultivates relaxation of the upper chest, especially the muscles under the shoulder blades, or "trapezius". This muscle relaxing will be release the tensions of head, neck and shoulder, that allow the singer to sing comfortably. The importance about the application of Pilates to voice practicing is to combine the techniques together as an effective tool. The first benefit is, the understanding of other information among the specialists. Second, the practitioner should be able to adapt the techniques during the Pilates classes. Third, and the most important part, is that the practitioner adapts the techniques of Pilates into the effective application. Pilates enlightens us in cooperating with our own body capacity which can assist the acting, singing practitioner and contribute to them experiencing self-ruling and expression (Melton, 2016).

Voice pedagogy is essential for the singer in helping them combine their body with body functions. The amount of air volume is an essential element of the phonating system to help the singer to stabilize movement of muscles that control the expiratory volume and phonating systems. The balance of expiration is the major mechanism that produces the intensity of the singing voice, for example, pitch, timbre and color, etc. The central nervous system takes control of this complicated system by combining these functions together. Pilates technique is the key to combine the beneficial exercises and adapting into muscle action into vocalization. Nevertheless, the singer will receive the benefit of (PNF-based Pilates exercises), by improving their breathing management (sing longer), use efficiently of muscle support (be able to sing louder with resonation), and be able to concentrate on physically and mentally related muscle and effected sound production. Pilates-based exercise is the concept that helps singers manage their body alignment and improved the figure, working synchronously with the respiration system during Pilates exercise. Therefore, Pilates-based exercises have pertinence to the voice pedagogy, and its elevated singing strategy with "Modern mind-body technique"(Asher, 2009). In this study body and mind control is the

volition strategy that helped the singer to manipulate the muscles and posture flexibility and released the tensions. The study helped researchers find a combination of Pilates respiration techniques and understand the important part of the muscle tension that effected vocal resonator (vibration) conditions. Additionally, this study will be available to the next researcher who is interested in the benefits of Pilates Methods in voice resonation with performers, in order to make a spectrum graph in order to identify the quality of sound change. Also to researchers who want to develop voice curriculums in the future. The following outlines the procedures related to the studies in human body structure, lung capacity and respiration. Pilates training has contributing body functions, singing techniques and voice pedagogies:-

-Pilates respiration-based breathing management: The study found that the active breathing is particularly assisted vocal mechanism. The Pilates training increased the respiration capacity for the singer to balance their body structure, which related physical movements and muscles. The Pilates breathing contribute the silent breathing that helps singers to control their voices easier and avoid losing the tone; because, the sufficient breathing has engages the singing supports that engage the abdominal muscles, and pelvic floor muscles (Melton, 2016).In addition, The Pilates practitioner was benefited to control breathing with low abdominal expansion that helps them to sustain the natural exhalation during singing and movements (Friedlander, 2015). Thus, the Pilates method stimuli the motor-learning skill about respiration mechanism and contributes singer to stabilized their body and tensions during voice performance.

- Pilates respiration-based Phrase duration: To sing longer, students need to be trained about the coordination of muscles during the inhalation and exhalation. In addition, mind-body controlling is most important for singer while singing; because, these functions contributes the correct postures that assists vocal performance (Asher, 2006). Pilates breathing method supplement the abdominal contraction while implied the diaphragmatic respiration that maintain the core muscle that keep body to stabilize the posture (Isacowitz & Clippinger, 2011).

- Pilates respiration-based Intonation/ pitch: Melton (2016) declared that Pilates method helps directly by allowing the breath and start phonation through muscles actions, for example, singers releasing their trapezius, neck, and shoulders out

of tension during exhalation. Additionally, Nelson and Zeller (2002) stated that singer needs a large amount of air volume to control their singing, to be free flowing in singing efficiently and accurately in sound pitches, and strengthening by sense of expanding the ribcage and abdominal wall then sustaining with torso the restricted the diaphragm into a natural position.

- Pilates respiration-based tonal quality/ interpretation: The Pilates breathing method deliberates the pattern to help singers be more aware of their body-mind connection. The method leads volitional breathing that supports the long-active breath with core supports and torso functions that constructively produce the quality of voice tones (Asher, 2009). Moreover, Pilates-breathing integration helps singers open their chest wall and cartilage and freely move laterally, which moves the sternum within position that restricted it from lifting shoulders and caused tensions and vocal sound (Melton, 2016).

CHAPTER III
RESEARCH METHODOLOGY

The purpose of this study was to investigate the effectiveness of Pilates respiration-based classical vocal technique (PRBC) in improving student's vocal performances. This chapter consists of research design, participants, baseline, music stimuli, procedure, dependent measure, and data analysis.

3.1 Research Design

Single-case research design was employed to investigate clinical procedure, and serve patients who were diagnosed with the symptom. The treatment may be applied to the diagnosed by a specialist, and the advantage of the single case approach was observed closely. In fact, results were returned to the investigator within the session. The results are vividly exhibited between the experimentation and the dynamic phenomena. Moreover, the single-case study is more flexible in estimating the outcome rather than the major sampling design. The researcher is able to provide individual intervention that is beneficial, and can re-experiment the previous interventions to be more innovative treatment (Nock, Michel & Photos, 2007).

The single case is designed, firstly, to investigate the individual case such as a person, a unit, a group, or a classroom with principle behaviors and phenomena. Secondly, the intervention can help the investigator explore and look in detail at the information that will answer the questions in qualitative analysis. Thirdly, the method emphasizes a specific direction in which the scholar needs in order to find the results and conclude previous interventions. Lastly, the researcher collects overall data without control group (Nock, Michel, Photos, 2007). "Single subject" is occasionally mentioned as "single case or single system." The single case design is open for the investigator to find the result within the variety groups. The case studies are full of researcher's evaluation that is qualitative description and treatment. Researcher and clinician can present their project with completed work with accomplished assessment.

The process of development needs efficiency and a flexible tool to estimate the outcome, and revolutionize to the future experimental research.

However, the first aspect that is evaluated after collecting data and conducting analysis is the independent variable. This concluded that one is limited validity, and involves the final evaluation. The single-case design is the designed platform to gather all data to emphasize the result from specific cases (Logan, 2007). Additionally, quasi-experimental research design is a platform of single-case study that requires an independent variable which is designed for a few cases of participants. The forms of the single case experimental design are A-B, A-B-A-B, and A-B-C-BA-B including the baseline and intervention procedures. A-B-A-B is the multiple baseline design with four experiment procedures. These help the researcher to examine the outcome of alternating baseline condition (Kazdin, 1982). The single case A-B-C-B is the condition of (C) procedure that is modified from (B) condition into (C) condition. It proceeds by the alternation of extra attention and control changed (Nock, Michel, &Photos, 2007).

In this study, single-case study (AB) design was employed to investigate in-depth experimental data of two participants. It included a baseline phrase with treatment phrases that were implemented for participants′ performance development. For this study, classical voice classes are the baseline phrases (A). They allow participants to learn regular lessons with “Exercises for the acquisition of agility” (Miller, 2009),and repertoire. Then, it is followed by phrase (B), which includes the intervention sessions that allow participants to learn the Pilates respiration-based classical vocal technique. The researcher can systematically measure their improvement.

3.2 Participants

The participants for this study were two students who have been learning classical voice lessons prior to their participation in this study. The choices of participants was determined based on the following criteria: 1) students who have been trained in classical voice lessons for at least one course/ four months, 2) students who have achieved a score in intonation/ pitch of equal/ or above 2, according to the

Classical Voice Rubric Assessment, and 3) students who have received a score in breathing management, phrase duration, and tonal quality/ interpretation of equal to or lower than 2.

Participant 1: The first participant is a 26-year-old male tenor. He obtained his bachelor degree in music, with a major performance in "contemporary voice." He studied a classical-voice basic lesson in one semester of his undergraduate study. He was selected to participate in this intervention through classical voice performance forms. Before this study started, participant 1 showed a difficulty in breathing control and using muscles to support singing classical music. Moreover, he demonstrated problem with body tensions around his neck, upper torso and middle torso, all of which limited him to singing higher ranges. The tonal quality of middle register was thus restrained. Due to his complications, the sound was not freely expressed, and resulted in the constriction in his throat while singing. Therefore, he was scored 1 in breathing management, 2 in phrase duration, 3 in intonation/ pitch, and 2 in tonal quality/ interpretation.

Participant 2: The second participant is a17-year-oldfemale soprano. She has been studying contemporary voice lessons for eight years, and has recently taken up classical vocal lessons for approximately four months. During the classical voice classes, participant 2 showed inconsistency with her voice-tonal control, and often times had a difficulty with the breathing preparations. Her breathing was insufficient due to the elevated upper chest. Tensions were observed on her neck during singing. However, the most serious problem in her singing occurred in the lower range when she sang through her glottis region rather than focusing on the chest region. Consequently, she had a difficulty in singing in higher ranges due to the inappropriate control of her tonal voice qualities. This condition is described as hoarseness sound expressions. Therefore, she was scored 2 in breathing management, 1 in phrase duration, 2 in intonation/ pitch, and 1 in tonal quality/ interpretation.

3.3 Baseline

In the baseline sessions, participants took classical voice lessons for a total of four sessions in a music studio at the College of music, Mahidol University, for

participant 1, and at the Musical Art Studio Bangkok for participant 2. The programs included breathing techniques and exercises, *"The Acquisition of Agility"* (Miller, 1996),vocal exercises, different scale patterns, and song "Caro mio Ben." There was no Pilates took place in the baseline phase. In addition, the classical voice lessons were held to collect data of the two participants for 50 minutes. The class contents and the summary of illustrating numbers in the baseline sessions are presented in Table 3.1.

Table 3.1 Baseline Session Elements

Technique	**Baseline Elements**	**Time Duration/ *Minutes***
1.	Breathing techniques and exercises	5
2.	The Acquisition of agility method	10
3.	Vocal warming up/ exercises	10
4.	Repertoires/ - *"Caro mio ben"*	25
Total	-	50

3.4 Music Stimuli

3.4.1 Intervention Theory

This intervention applies the Pilates respiration-based classical vocal technique (PRBC)by allowing the participants to perceive the body and mind awareness that contributes to classical singing. The elements of respiration-anatomical system are related to the body mechanism in the way that they fill air in the thoracic cavity. The Pilates method involves explicit procedures, which urge the body to let oxygen pass through the diffusion of lung capacity.

Breathing mechanism is the primary process of this intervention, which is called pulmonary ventilation system. This system deals with the inhalation and exhalation. "When the dome shaped diaphragm contract, it flattens out, allowing more

height in the thoracic cavity" (Isacowitz & Clippingger, 2011). The inhalation propels the respiratory muscles and related muscles, especially the diaphragm, to contract and drop downward. The thoracic cavity expands in height and allows the air to fill deeper. The ribcage is expanded and moves downward to rectus abdominis and external oblique. In this intervention process, participants learned the Pilates respiration mechanism and focused on breathing diaphragmatically. This controlled the abdominal muscle to move forward, which was related to the trasversus abdoninis. This also controlled the pubic floors to move downward and contract. Therefore, the participants acquired the respiration strategy, which offered necessary breathing techniques and exercises that can be applied to their vocal performances. Additionally, the researcher examined the participants' vocal performances, and observed the tensions in their figures and the movement of related muscles, such as neck, arms, legs, chest(ribcage), and core muscle. The observation indicated the overall correct figure in the Pilates respiration system through the practice of "neutral supine" position.

3.4.2 Pilates Respiration-Based Classical Vocal Technique (PRBC)

The balancing of the vocal resonators depends on the elimination of unnecessary tension and the proper alignment of the body. Indeed, the unnecessary tension with insufficient breathing while singing usually causes the singer to be overly exhausted. Oftentimes, the singer experiences many stressful situations, such as performances, important rehearsals, and auditions. Nonetheless, proper body alignment can assure more self-confidence and poise under these stressful situations. Many teachers agree that good posture communicates confidence (Asher, 2009). The good postural alignment for singers is not static. The body control and concentration on dynamic movement isthe correct postural activity. A moment to the next may change based on how the singer feels during the stage performance. The body awareness and alignment becomes even more crucial on staged performances, such as an opera. Most importantly, the main focus is on the singing, because the singer increasingly dominates the performance roles, and singers must find ways to sing well even when they are not in ready conditions (Neely, 2012).

As the singer's body must continually change and move, he or she must develop a strong sense of self-awareness to maintain proper postures. As an effective method, Pilates collaboratively contributes to the body and mind, which emphasizes body alignment and correct breathing. Moreover, Pilates exercises have proven clinically to strengthen muscles and increase flexibility of body coordination. Therefore, integrated vocal and Pilates training has the potential to improve voice performance and to develop a physiology that avoids overused injury (Hawkins, 2004).

With that in mind, vocal trainers should be educated in the principles for phonation function as much as physical mechanism. They should be able to combine breathing techniques to help students improve and learn properly. Therefore, Pilates is one of the options for teachers to combine appropriate breathing techniques for individual students. In fact, Pilates breathing principle is the key factor that allows this intervention to be consistent and contribute to classical singing. To inhale deeply allows oxygen to circulate in the blood, which helps the body release tensions from stressed muscles. On the other hand, exhaling until the last breath of air allows supporting muscles to work effectively, thus learners emphasize the right group of muscles. The method allows participants to feel relaxed and release all neck and shoulder tensions by taking a deep breath (Merrithew Corporation, 2001).In this study, participants learned the major principles of Pilates Respiration techniques and were taught about physical collaboration. The PRBC intervention was one of the most important factors that develops singers′ body control and musical focus. This experimentation comprises four stages: 1) lateral breathing, 2) diaphragmatic breathing on neutral supine, 3) pelvic floor muscle engagement, and 4) integration exercises.

3.4.2.1 Lateral Breathing

In the first stage, participants were seated on the fitness mat with strait back and relaxed neck and shoulders. They breathed through the nose slowly and relaxingly by crossing the fingers of the two hands and placing them on the lower chest. Participants allowed the ribcage to expand laterally, then the hands were gently moved apart, thus carefully prohibiting the chest from slipping forward. They

held their breath counting from one to four. Next, participants exhaled slowly by ejecting all the air through the mouth and kept repeating it until they felt comfortable and could breathe correctly (Kelly,2006).

3.4.2.2 Diaphragmatic Breathing on Neutral Spine

In the second stage, participants lied on their back, lifted knees with neutral spine alignment, and breathed in Pilates breathing techniques. Participants released the neck and shoulder tensions and relaxed. They tilted the pelvis upward (imprint position), inhaled through the nose, and exhaled through the teeth with lips pursed (neutral position). They breathed letting air to the diaphragm and expanded the abdominal muscles outward. Then, they released the breath slowly without neck and shoulder tensions (Isacowitz, & Clippinger, 2011).Diaphragmatic breathing allows the participants to feel the air volume that releases the tensions of the abdominal muscles. During the inhalation, participants must expand laterally the chest and hold the breath while counting from one to four, then exhale naturally.

3.4.2.3 Pelvic Floor Muscles Engagement

In the third stage, participants learned to exercise the pelvic floor muscles. The pelvic floor muscle is the inner muscles that are often ignored, but are actually important for balancing and firming muscle platform. That is, the pelvic floor is engaged with transverse abdominis, and both muscles move synchronously during Pilates exercises (Kelly, 2006). As soon as the participants accomplished the lateral and diaphragmatic breathing, they were ready to continue the practice of lifting and squeezing the pelvic floor muscles during the abdominals contraction. Participants learned the pelvic-floor activities by pulling the anal down and squeezing it during diaphragmatic respiration. Once they simultaneously combined all three stages, they aimed to continue the Pilates respiration exercises for ten minutes at the beginning of every intervention session.

3.4.2.4 Integration Exercises

In the fourth stage, participants stood up with a relaxing posture in the voice sessions. They aimed to use the diaphragmatic breathing while

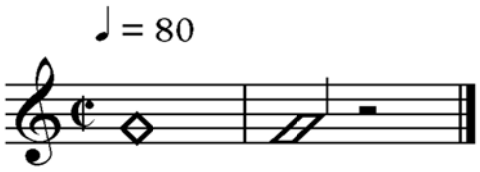
engaging with the pelvic floor muscles. Participants inhale during the three combined stages of Pilates respiration mentioned above, while counting from one to four. Next, they exhaled while maintaining the position of lower abdominals (Hypogastric or pubic region) by pushing outward for five times. Therefore, they released with a certain amount of air volume. When participants focused on the breathing management without phonation, the inhalation must be silent. In addition, they combined the three stages of breathing management, and passed exercises that contributed to the diaphragmatic function and muscle support mechanism. This PRBC exercises included three levels.

Level 1: Stand up and breathe silently on rhythmic continuity in three phrases (Inhalation, Detention, and Exhalation) by counting the numbers in the table below. The more numbers indicate the more extensive breathing of air volume.

Table 3.2 PRBC Breathing Detention

PRBC Breathing Detention		
Inhalation	**Detention**	**Exhalation**
12345	**12345**	**12345**
1234	**1234**	**1234**
123	**123**	**123**
12	**12**	**12**
1	**1**	**1**

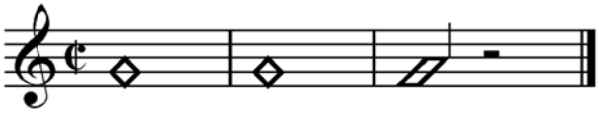
Level 2: These exercises were designed to develop the breathing management without notation. Participants sustained the breathing into sounding (Ssss) until the ending beat for three levels. The second method allowed participants to control higher air pressure by managing the breathing into sounding (Brrr), with the lips rolled form exercise 1-3.



Ssss_____

Brrr_____

Figure 3.1 Exercise 1

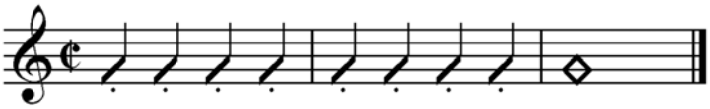


Ssss_____

Brrr_____

Figure 3.2 Exercise2

Active-breathing staccato: Pushing abdominals at the "pubic region" outwardly during the exhalation along with every staccato beat and whole beat.



Ssss_____

Brrr_____

Figure 3.3 Exercise 3

Level 3:

These exercises established the full breathing energy with continuous notations and different scales in three levels. Participants started rolling the lips from lower key ranges and modulated in several neighboring keys from exercise 4-6.

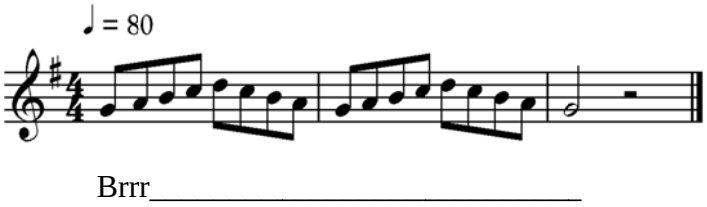


Figure 3.4 Exercise 4

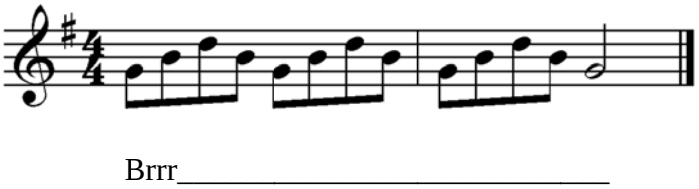


Figure 3.5 Exercise 5

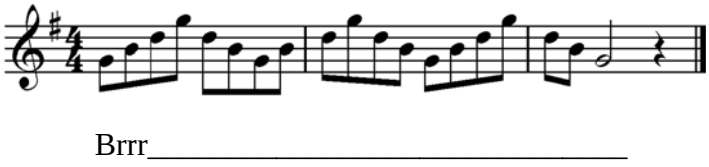


Figure 3.6 Exercise 6

3.4.3 Music Selection

The private studio classes selected three methods for learning. These methods considerably cultivate the vocalization, which is an important advancement for each lesson. Firstly, students learn a variety of scales that are brought from "The Structure of Singing" written by Richard Miller. The section in this literature is "Exercise for the acquisition of agility," with many patterns of several voice exercise pedagogies being too advanced for beginners and some learners. These exercises were designed to serve students who deal with different pitch, rhythmic, vowel, tone and musical sequences. Each of the exercise patterns should be modulated in several neighboring keys, and sung in middle voice (Miller, 2009).Secondly, while new learners can be trained to a higher pitch with head voice, they are not yet familiar with singing with words, such as English, German and French. Thus, teachers may have to find another way to help students sing better with foreign dictions. Italian literatures were recommended to be the primary source of learning for beginners. This includes

“Suggested ideal curriculum (starting with the core): Languages: basic Italian and English only at this stage” (Chapman 2011).

Male tenor voice is in the range between C3 to C5.The singer’s range is defined as the pitches and sound spectrum of vocal tract and tonal quality or sound resonation (Johnson, 2007). According to Miller (1993), the “training for tenor voices” concluded that this voice type sings sufficiently in head tone, but does not sing easily in middle high and high voices, and the pivotal points often reach around Eb 4 and Ab 4. Non-operatic piece and Baroque repertoire are recommended for this voice category. Therefore, participant 1 is a tenor eleggiero (light tenor) voice type, and his voice should be assigned to sing in Morbidezza (sweetness) tone with non-intense of rhythmic patterns at the beginning. Thus, “Caromio ben” in key E flat major, and “Steal away” in key A flat major were chosen to be the first and second song for participant 1. English repertoire enriches the tone, which helps him develop the vowels, consonant and techniques after learning Italian pieces. Participant 1 was able to continue with Italian to English vowel modification and tonal quality.

Williams (2012) summarized that an adolescent girl who sings high range is an unusual sensation, but vocal organ is developing to grow up to 34%. The vocal onset may not fully develop into richness of tone. Additionally, the training strategy in their pitch range, tonal quality and stamina are limited. Teachers need to customize appropriate lessons and compensatory habits for them, which improve the vocal skill in this physical condition. Moreover, the larynx of females has continuously developed after the puberty period, and at the age of fourteen, it is appropriate for females to start the private lesson. The logical principle for adolescent female singers to start singing is that they should avoid shifting into too low and high tessituras extremes. Additionally, they should not be singing the intensity of music rhythmic and scale patterns, but should keep consistency in remaining in the middle range until they improve and feel comfortable singing in other ranges. The soprano ranges are classified into these register zones: at the lower pasaggio (chest) from G3 to Eb4, at the lower middle from Bb3 to C5, upper middle from C#5 to F#5, upper from G5 to C6, and flageolet from D6 to A6 (Miller, 2000).

Before this study, participant 2 was comfortable singing in upper middle range, C#5 to F#5. Caro mio ben in key Eb major was chosen to be her first song,

because the range of this song is between Eb3 to F4. The range helped participant 2 to develop lower (primo) pasaggio and reflected her ability to sing in mixed chest voice. “Pie Jesu” in key Ab major was chosen to be her second song. Soprano needs to develop the tone quality, which is enhanced by active breathing and muscle support. The reason for choosing Latin songs for participant 2 was that she needs to continue developing her vocal agility, which deals with respirational volition, phonation and voice resonation. The simplistic vowel and consonants in Latin songs provide a method that is similar to Italian. On the other hand, the researcher set a higher key on the second song “Pie Jesu” to promote the soprano’s formants Latin literature. This allowed participant 2 to enlarge the word figures that will help her sing the “Onset” rather than regarding the consonants, which constricted the syllabication.

3.4.4 Intervention Strategies

This intervention combined two experimental strategies. First, each session began with the introduction of Pilates respiration for participants to understand the Pilates respiration and anatomical-related information. Next, this step allowed participants to start learning one of the intervention components, which is the Pilates respiration-based classical vocal technique (PRBC). Students experienced the engagement of body and mind control, which is connected to their physical awareness of the intervention methods, thoracic cavity, abdominal muscles and pelvic floor muscles. When students had been trained for 10 minutes, the next method was private voice classes. The classical-voice session lasted for 50 minutes, and consisted of vocal exercises that are guided by the book “The structure of singing.” Each participant learned two music literatures. The participants were engaged in singing classical voice lessons by combining PRBC to improve their performances, for approximately 60 minutes in ten intervention sessions. Each session included fiveprocedures:1) PRBC that consisted of lateral breathing, diaphragmatic, breathing on neutral supine and pelvic floor muscles,2) integrationexercises,3) “The acquisition of agility”(Miller, 1996) method, 4) Vocal warm up/ exercises, and 5) repertoires that included “Caro mio ben” with “Steal away” for participant 1, and Caro mio ben with “Pie Jesu” for participant 2. These are illustrated in Table 3.3.

Table 3.3 Summary of Intervention Strategy Procedures / 1 Hour

Procedure	**Participant 1** ***10 sessions***	**Participant 2** ***10 sessions***	**Time Duration** ***Minutes***
1.	Pilates respiration-based classical vocal technique (PRBC) 1)Lateral breathing 2)Diaphragmatic breathing on Neutral supine 3) Pelvic floor muscles engagement respiration	Pilates respiration-based classical vocal technique (PRBC) 1)Lateral breathing 2) Diaphragmatic breathing on Neutral supine 3) Pelvic floor muscles engagement respiration	10
2.	Integration exercises	Integration exercises	5
3.	Voice-Acquisition of agility method	Vocal-Acquisition of agility method	10
4.	Vocal warm up/ exercises	Vocal warm up/ exercises	10
5.	Repertoires/ - Caro mio ben - Steal away	Repertoires/ - Caro mio ben - Pie Jesu	25
Total	-	-	60

3.4.5 Intervention Materials:

3.4.5.1 Pilates tools

- Gym cloths, participants need to wear comfortable clothes to allow them to move and breathe freely.
- Gym Fitness mat, participants lay on the fitness mat.
- Towel, participants place towel on the gym fitness mat.
- Bottle of water, in case participants are thirsty after PBAC.

3.4.5.2 Music instrument and tools

- Piano, for playing an accompaniment.

- Sheet music, voice exercises and songs sheets.
- Check list form, to evaluate the participants' performances.
- Visual and audio recorder to collect data in all sessions.

3.4.6Intervention Schedule

After four baseline (A) sessions finished, participant 1 and participant 2 started to take the Pilates respiration-based classical vocal techniques individually (B) for one time a week, within a period of 4 months. Since this intervention involved a minor below 18 years of age, parents were allowed to observe during the intervention hours. In this study, all students participated individually in the baseline session (A) for 50 minutes in 4 sessions. Next, they acquired intervention (B) for 60 minutes in 10 sessions. This is exhibited in table 3.4.

Table 3.4 The Number of Sessions

Session / Participant	Baseline/ 50 minutes (A)	Intervention/ 60 minutes (B)
Participant 1	4	10
Participant 2	4	10

3.4.6.1 The duration session

For this study, both participants enrolled in the individual music stimuli (B). Each session takes 60 minutes, and included Pilates respiration-based classical vocal techniques, integration exercises, classical vocal warming up and singing.

3.4.7Setting

The researcher is a classical vocal teacher and specializes in Pilates respiration techniques that created the Pilates respiration-based classical vocal technique (PRBC). Two Participants are located into different training locations. Participant 1was at the College of Music, Mahidol University. Participant 2was in a music training studio at Musical Art studio, Bangkok. All studios provided convenient spaces for PBAC and sufficient equipment that allowed the researcher to explain

concepts to the participants. Equipment included computer laptop, white board and marker, piano, sheet music, and air conditioning.

3.5 Procedures

A single-case experimental design was employed in this study to examine the effect of the Pilates respiration-based classical vocal technique (PRBC) on the students' vocal performances. The participants are classical voice students who are qualified according to the criteria as mentioned in3.2. After the study was approved by MU-SSIRB, participant 1 and the parents of participant 2 were asked to sign the participant information sheet and the consent form in order to partake in this study. According to the study, the simulation factors guided the participants to understand the function of the phonation mechanism by being taught the PRBC exercises. The researcher employed the single-case simple (A-B) design that was presented in the baseline sessions (phase A) for 4 sessions. Each session lasted for 50 minutes, with regular classical voice lessons. Then, they took the intervention sessions (phase B)for 10 sessions. Each session lasted for 60 minutes, with PRBC before classical voice lessons. Additionally, the researcher evaluated both participants at the end of all baseline and intervention sessions by Classical Voice Rubrics Assessment forms. All sessions were recorded by a video recorder for subsequent inspection of actual-vocal improvement.

3.6 Dependent Measures

To collect data, the Classical Voice Rubrics Assessment was developed as a research instrument. The criteria descriptions helped to grade participants objectively using the rating scales based on their performances. The levels of the criteria were classified to evaluate the performance levels, which targeted objective assessment for collecting data from participants. The rubrics assessment helped clarify the expectations on students' performances by providing the descriptive objectivities. This classical voice rubrics assessment aimed to evaluate the level of criteria that included four items: *1) breathing management, 2) phrase duration,3) intonation/ pitch, and*

4) tonal quality and interpretation. In addition, each item of Classical Voice Rubrics Assessment is categorized into five performance levels: 1) poor, 2) minimal, 3) sufficient, 4) above average, and 5) excellence.

1) Breathing management: To investigate the breathing control, the use of downward and outward, and the reliance on the lower abdominal muscle to work as a support and release the body's tension during singing.

2) Phrasing duration: To measure the ability to handle singing phrase cycles. This compound may last for more than two phrases. Moreover, this rates students who could sing through the phrases with effortless and natural flow.

3) Intonation/ Pitch: At this point, to measure their singing pitch, the ranges of the participants' musical expressions and the efficiency to harmonically blend with accompaniments.

4) Tonal quality/ Timbre: To evaluate the quality and purity of the head voice resonance without hoarse sound and disturbance of cracked voice. Participants are able to sing all ranges that involved upper-head voice register in varied vocal registers with comfort. This stage estimated the musical expressions in carrying volume, intensity, and dynamic, which reflect the emotion of tone/ quality. This also includes bright and dark tones or (Passaggio modification), rough/ smooth along with the articulations.

3.6.1 Classical voice Rubrics assessment

Developing rubrics assessment and criteria is important to clearly determine the performance levels. With this, the instructor can align the course with a specific module to help students meet their requirements. Rubrics is defined and agreed upon by all the evaluators, making its likeliness in providing comparable ratings even higher. Moreover, classical voice rubrics assessment was developed, firstly, with the tool indicated in the literature review of "Assessment & Evaluation in Higher Education." Sadler (2005) put forward appropriate description rating levels. Secondly, the information criteria were analyzed to develop this form. Thirdly, the description rating levels were supervised by experts who specialized in classical vocal teaching. Fourthly, the reliability of this form was examined by inter-observers.

Finally, this assessment form was later improved for more appropriate description that is suitable for this study.

3.6.2 Collecting Data with Classical Voice Rubrics Assessment Form

In this study, the data were collected through the observation at the end of all sessions and the subsequent observation on videos. The classical voice rubrics assessment form was used to collect data by identifying the level of participants' vocal performances. The observers identified and rated participants' performance level, which is categorized into one of the 5 score levels, namely,1) poor, 2) minimal, 3) sufficient, 4) above average, and 5) excellence. The descriptive levels are presented in figure 3.7.

For Breathing Management

5 = The student breathes deeply and expands the abdominal muscle and ribcage laterally, relaxing upper torso.

4 = The student breathes deeply and expands the abdominal support and ribcage laterally and air volume flows.

3 = The student manages to breathe deeply with inaudible but shows some tensions on neck. For Phrase duration.

2 = The student occasionally manages to breathe deeper but shows the tensions on neck and breathes audibly.

1 = The student needs to improve a lot of deep breathing and neck tensions, shoulders and upper chest lifting.

For Phrase Duration

5 = The student can sing through the phrase with effortless and natural flow.

4 = The student can sing effortlessly through the phrases.

3 = The student can sing through the end of all the phrases but not smoothly.

2 = The student occasionally sing until the end of phrasing.

1 = The student fails to hold the phrase until the end.

For Intonation/ Pitch

5 = Singing precisely in tune and naturally expresses without effort.

4 = Student sings confidently with accurate pitches.

3 = Pitch is precisely in tune, only a few errors in pitches, but does not interrupt the performance.

2 = Pitch is mostly accurate, but errors interrupt the performance.

1 = Student sings with many inaccurate pitches.

For Tonal Quality/ Interpretation

5 = Student sings clearly in all ranges with head register and fully resonation, with comfort and relaxed body alignment, / Student expresses precisely the emotions of tone of bright, medium, deep and smooth passaggio modification.

4 = Student sings clearly in all ranges with head voice register and delivers with comfortable singing voice. / Student is able to sing with clear tone of bright, medium, deep and smooth of the song.

3 = Student sings clearly with head voice on the middle and upper ranges, but with some hoarseness sound, / Student manages to interpret proper tone; bright, medium and smooth, according to music literature.

2 = Student sings clearly with head voice on the middle range but sound hoarseness on the higher registers, / Student has ability to sing; tone of bright, medium, deep, and smooth but lack quality in some sections.

1 = Student sings with a hoarse character in all ranges; low middle and high range, / Student cannot interpret the right tone of bright, medium, deep, and smooth of the music literature.

Figure 3.7 Definitions of the Assessment Items for the Classical Voice Rubrics Assessment Form

3.6.3 Inter-rater Reliability

This method of inter-observer reliability was employed to support the credibility of this research project. The experts were allowed to check the reliability of the instrument tools and to observe the experiment process. The rubrics assessment (Rating scales) was examined between Inter-rater reliability and Inter-rater agreement. In fact, the observer randomly examined partially (20%) of all the interventions, through recorded videos of each participant. The correlation coefficients were used to measure the associate of paired measurement between two observers. Therefore, this Pearson's product showed the consistency between the two observers. The inter-rater reliability of breathing management section indicated a strongly significant result in

statistical correlation (r =.87, p< .05). In addition, the phase duration section showed a strongly significant correlation (r = 1.0, p< .01). The inter-rater reliability of the intonation/ pitch (r = .87, p < .05) demonstrated high agreement rates between the two observers. However, Tonal quality/Interpretation produced did not illustrate a strong correlation (r= .33, p = .02) between the two observers.

3.7Data Analysis

Visual analysis: The data collection demonstrated in detail the visual inspection of graph. According to this study, the observation data of classical voice performance was analyzed by the baseline and treatment periods. Each participant represented the statistical analysis graphs, which exhibited the level changes and the trend of participants' performance competency.

CHAPTER IV
RESULTS

The purpose of this study is to investigate the Pilates respiration-based classical vocal technique in students' vocal performances. This chapter presents the findings of two case studies. The findings of each case consist of two sections: background of participant, and visual analysis of classical vocal performance including 1) breathing management, 2) phraseduration,3) intonation/ pitch, and 4) tonal quality/ interpretation. Details are discussed below.

4.1 Case Summary

Participant 1

Background

Participant 1 is a male aged 25 years old. Before participating in the experiment, he studied contemporary voice major at the Music College, Mahodol University, for four years. At the moment, he is pursuing a master's degree in music education in contemporary voice major. He is a music teacher, teaching privately in piano and voice at a music school. From the observation, he has a potential to express music with excellent tone and dynamic, and to broaden his musical skills. Indeed, he is able to read music and express it properly in different styles. However, there are still some errors in rhythm and pitch, and some musical articulation sections in his classical voice performance.

Furthermore, he had learned classical voice techniques in four classes before he decided to participate in this intervention. After four classical voice lessons, he is able to sing in classical style, but with the limitation of carrying tune and tone classically. This results from his insufficient breathing and muscle tensions. Therefore,

participant 1 poorly controled singing from the middle range up to the higher range. It was hard for him to adjust the different vocal placement and several registers. The sound was not freely expressed on head register. He occasionally used throat to robust the sound more than head register, which caused constrictions on vocal folds and harsh sound on middle and higher ranges. Most apparently on visual inspection, his body was under tensions. For instance, his shoulder lifted and his throat muscle was uncomfortable while singing.

The Visual Analysis of Classical Vocal Performance.

During baseline and treatment sessions, classical voice Rubrics assessment form was used to collect the data (classical vocal performance) of participant 1, consisting of 1) breathing management, 2) phrase duration, 3) intonation/ pitch, and 4) Tonal quality/ Interpretation. The visual analysis was used to represent the data analysis of all the sessions. Additionally, the results were from the beginning of baseline session to the last intervention session. The results are presented below as line graphs.

4.1.1 Breathing management

During baseline sessions, participant 1 managed to breathe deeply and audibly. His upper chest was lifted, and some tension was expressed at his neck muscle, with mean occurrence of 2 and the range of 2 to 2. The result that was reflected constantly was scored 2 from session 1 to session 4. During the intervention session, the mean occurrence was 3.2 and the range was 3 to 5. The scores were reflected constantly from session 5 to session 7. In session 8, participant 1 learned the second song; thus, his inhalation control dropped to 2. The following sessions from session 9, it slightly increased to score 3 and remained still at the same range until session 12. The scores were improved to 4 in session 13, and gradually improved to 5 in session 14, as shown in Figure 4.1.

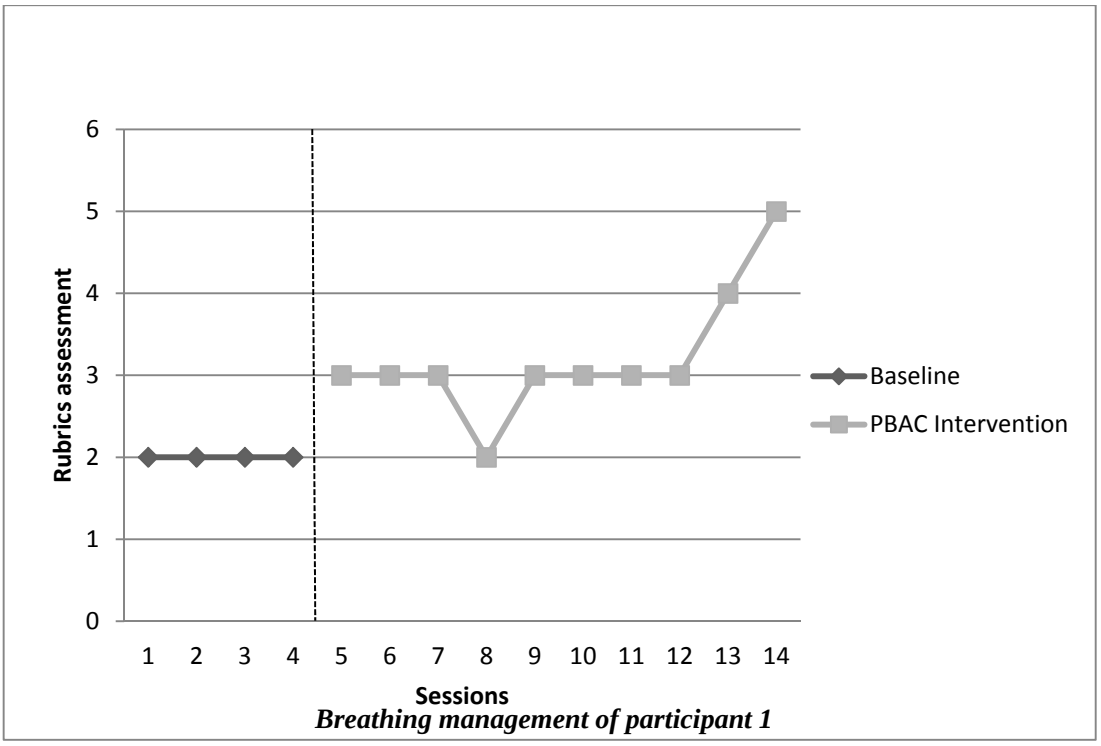


Figure 4.1 Rating scale's numbers of breathing management of participant 1: during baseline, and intervention sessions.

4.1.2 Phrase duration

Phrase duration refers to participant's ability to extend phrase during his performance at the end of the session. This function requires the level of air flow and subglottic pressure that collaborate with muscle modification (Miller, 1993).During the baseline session, his singing phrase management, the score constantly remained at 2, with mean occurrence of 2 and range of 2 to 2. After introducing the treatment, the score increased to level 3, with mean occurrence of 2.9 and range of 2 to 5. After three treatment sessions, the score from session 8 to 9dropped to 2 at the second song (Steal away). From session 10 to 12, the score was constant. The score increased slightly to 4 in session 13, and to 5 in session 14, as shown in Figure 4.2.

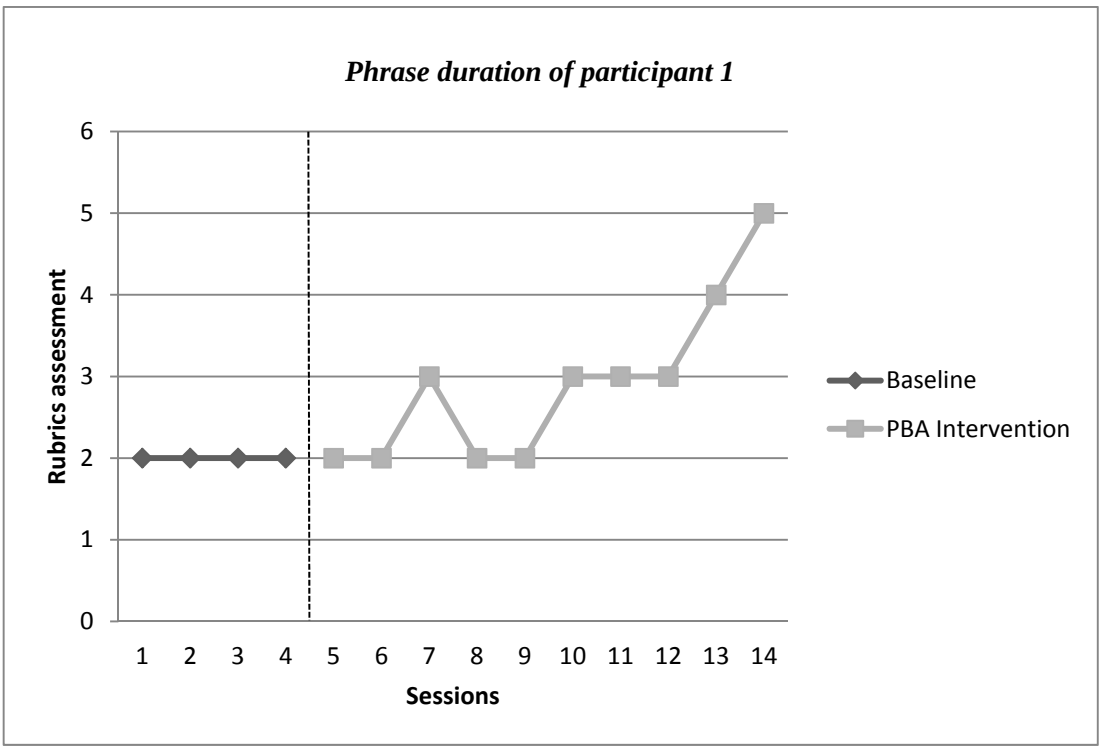


Figure 4.2 Rating scale's numbers of phrase duration of participant 1: during baseline, and intervention sessions.

4.1.3 Intonation/ Pitch

During session 1 to 3, the score of participant 1 was 2. In the 4th session (baseline), score 3 occurred, with a mean occurrence of 2.25 at the range of 2 to 3. The score of the next intervention session constantly remained from the last baseline session to treatment session 5 and 6. The score improved to 4, with a mean occurrence of 3.5 at the range of 3 to 4. At the second song, the score suddenly dropped to 3 and remained there for three sessions: from session 8 to 10. The next session, the score increased from3 to4 and remained still throughout four sessions: from session 11 to 14, as shown in Figure 4.3.

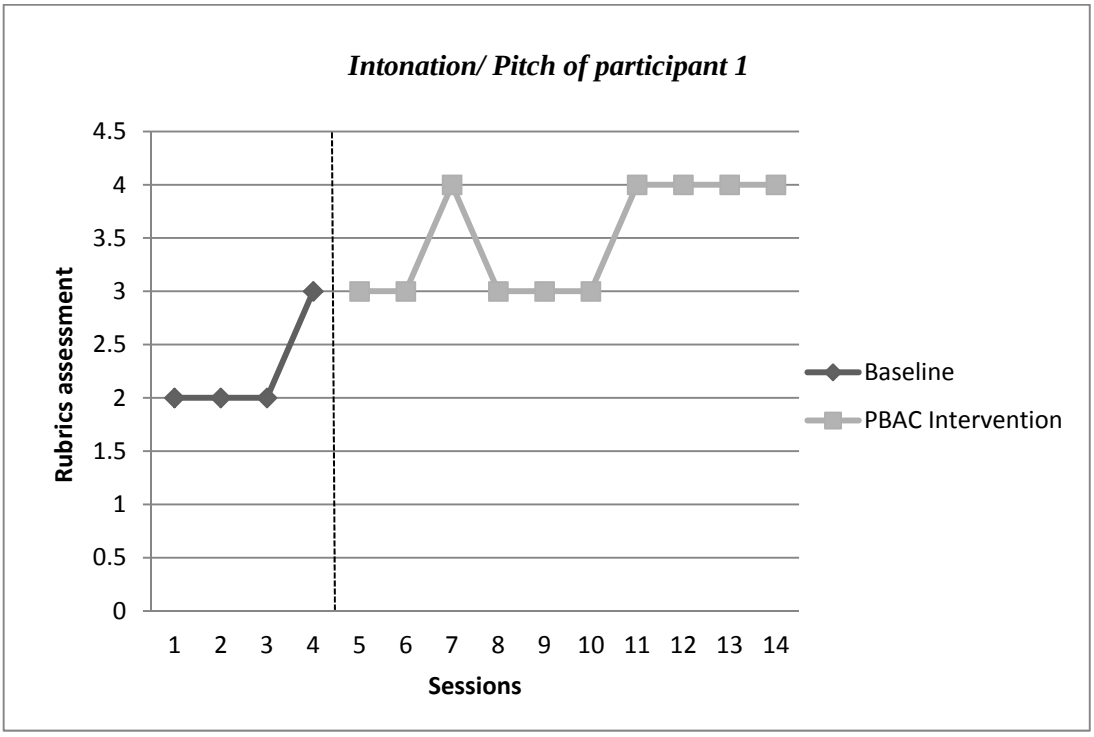


Figure 4.3 Rating scale's numbers of intonation/ pitch of participant 1: during baseline, and intervention sessions.

4.1.4 Tonal quality/ interpretation

Participant 1 scored 1at his first song (Caro mio ben). The next score of session 2 and 3 rose to 2, with a mean occurrence of 2 and a range of 1 to 3. In the last baseline session, the score improved to 3, and remained until the treatment session 5 and 6. The last session (7) of the first song, score improved to 4, with a mean occurrence of 3.4 at the range of 3 to 4. In session 8, the score dropped to 3 and remained stable until session 11. The last three sessions, 12 to 14, the score increased to 4,as shown in Figure 4.4.

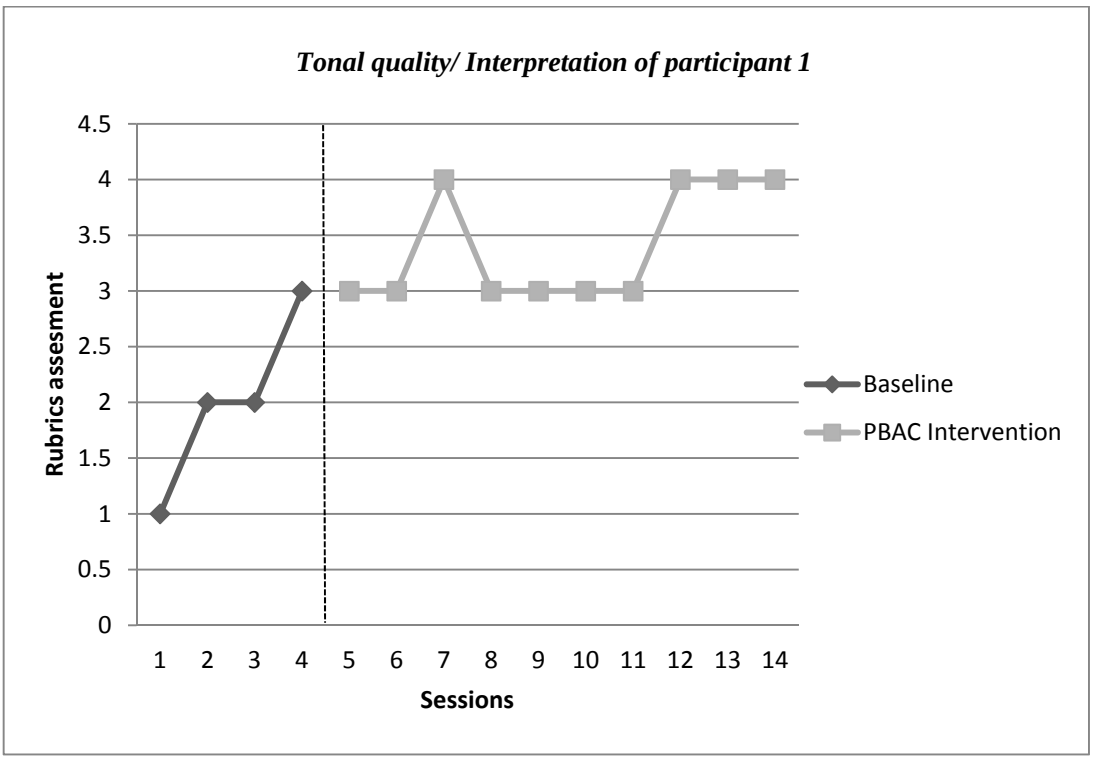


Figure 4.4 Rating scale's numbers of tonal quality/ Interpretation of participant 1: during baseline, and intervention sessions.

4.2 Case summary

Participant 2

Background

Participant 2 is a 17-year-old female with musical training in voice and piano since 5 years of age. Previous development reveals her musical sense that shows the ability to sing on pitch with a diversity of genres, such as musical theatre and contemporary music. Moreover, she learned classical piano and received the royal certificate (grade 8). She has been learning contemporary vocal lessons with two teachers since she was 10. Additionally, she learned with the researcher for 10 lessons and participated in this experiment.

From previous studies, she sings contemporary music and is able to sing in tune with musical competency. Nonetheless, when singing in high note on (mask resonation), the sound mixed with hoarseness, and it was occasionally off tuning (flat). Moreover, she had insufficient breath to sing on suspension notes. In terms of classical singing, she has to learn all the new breathing techniques and vocalization.

The Visual Analysis of Classical Vocal Performance

During baseline and treatment sessions, developing rubric assessment(Rating scales) was used to collect the data (classical vocal performance) of participant 2, consisting of1) Breathing management, 2) Phrase duration, 3) Intonation/ Pitch, and 4) Tonal quality/ Interpretation. The visual analysis was used to represent the data analysis of all the sessions. Results from the beginning of the baseline session to the last intervention session are illustrated below as line graphs and column graph.

4.2.1 Breathing management

The breathing management section increased from score 1 to 2 in the 2nd session, and remained constant until the5thsession. The mean occurrence was 1.75 at the range of 1 to 2. During the first intervention session, the score of breathing control remained at 2 and slightly increased to 3 from session 6 to 10. Next, in the 11th session, an observation revealed that score 4 constantly remained until the 14th week, with a mean occurrence of 3.3 at the range of 2 to 4, as shown in Figure 4.5.

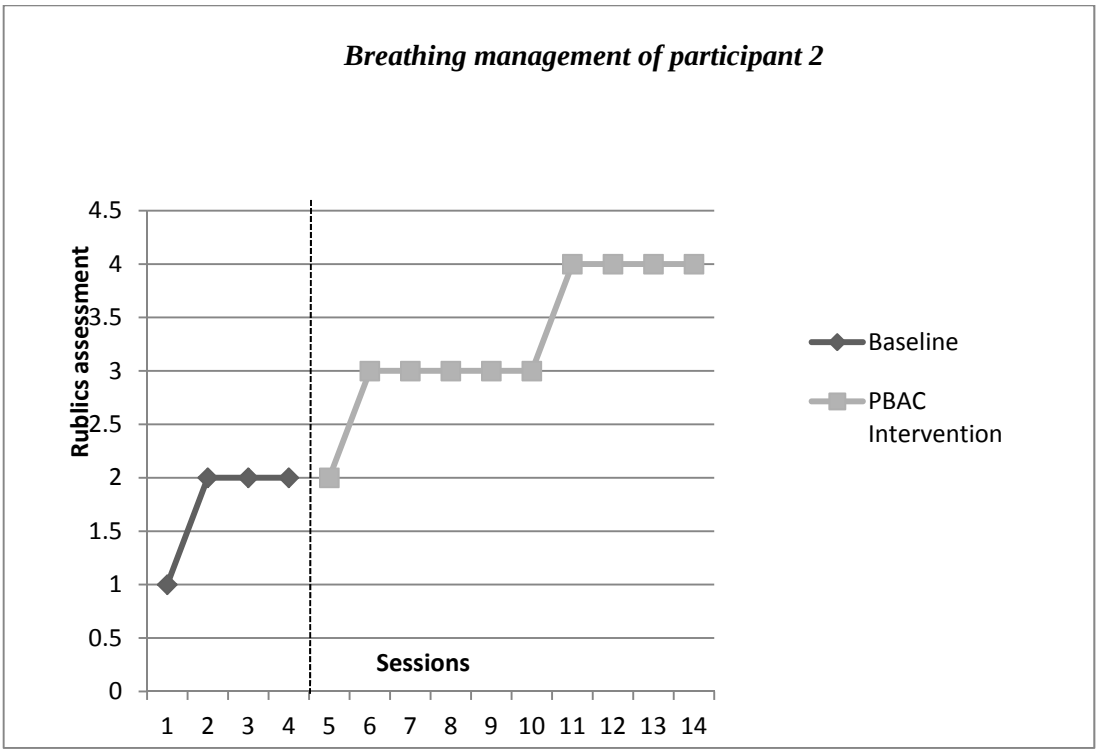


Figure 4.5 Rating scale's numbers of breathing management of participant 2: during baseline, and intervention sessions.

4.2.2 Phrase duration

All through the baseline session, line graph presented the score of level 2 on her phrase duration, with a mean occurrence of 2 and a range of 2 to 2, which remained stable throughout the following session 5 and 6. The next treatment session (7), the score was at level 3, which remained relatively stable at scale 3 until week 12. The mean occurrence of within intervention sessions was 3, with the range of 2 to 4. The score rose to 4 at treatment session 13, and constantly remained still to the last session (14), as shown in Figure 4.6.

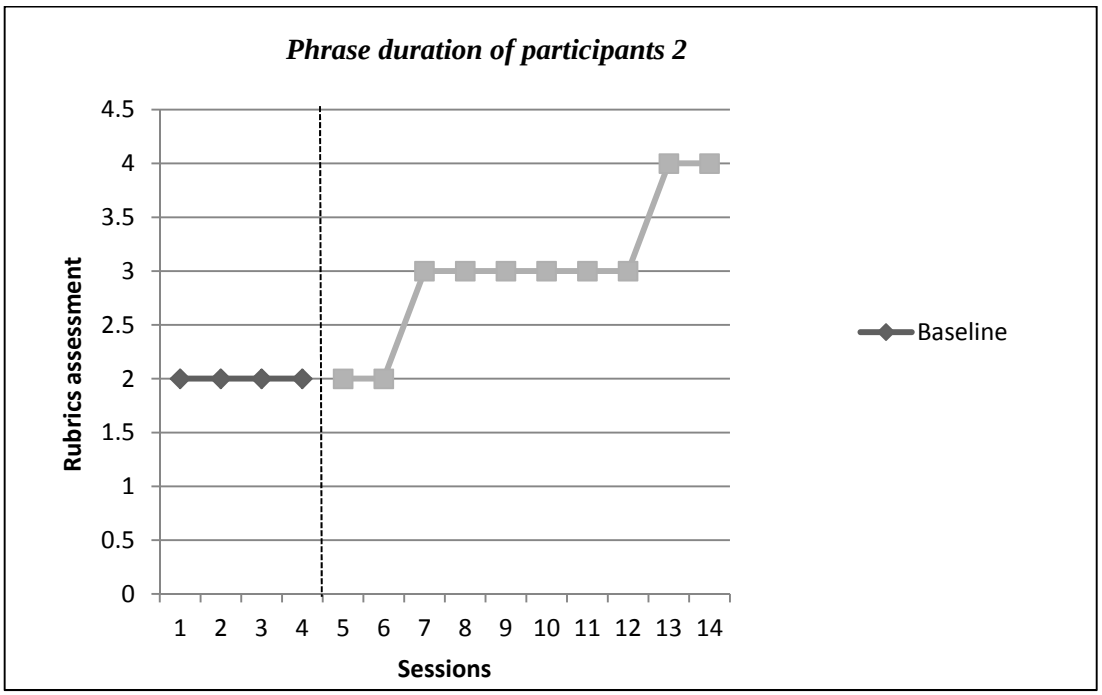


Figure 4.6 Rating scale's numbers of Phrase duration of participant 1: during baseline, and intervention sessions.

4.2.3 Intonation/ Pitch

During the baseline session, she improved (Intonation/ pitch) to score 3 at the 2nd baseline session, and constantly remained still to session 4, with mean occurrence of 2.75 at the range of 2 to 3. After introducing the PBAC intervention, participant 2 scored 3 and remained at the same level until session 9. In session 8, she learned the new song (Pie Jesu), she received score 4 in session 10 and 11. After session 11,her score fell to 3in session 12. However, the 13th session slightly improved to score 4. The mean occurrence of intonation/ pitch measurement was 3.4, with the range of 3 to 4. Score 4 remained until the last session (14), as shown in Figure 4.7.

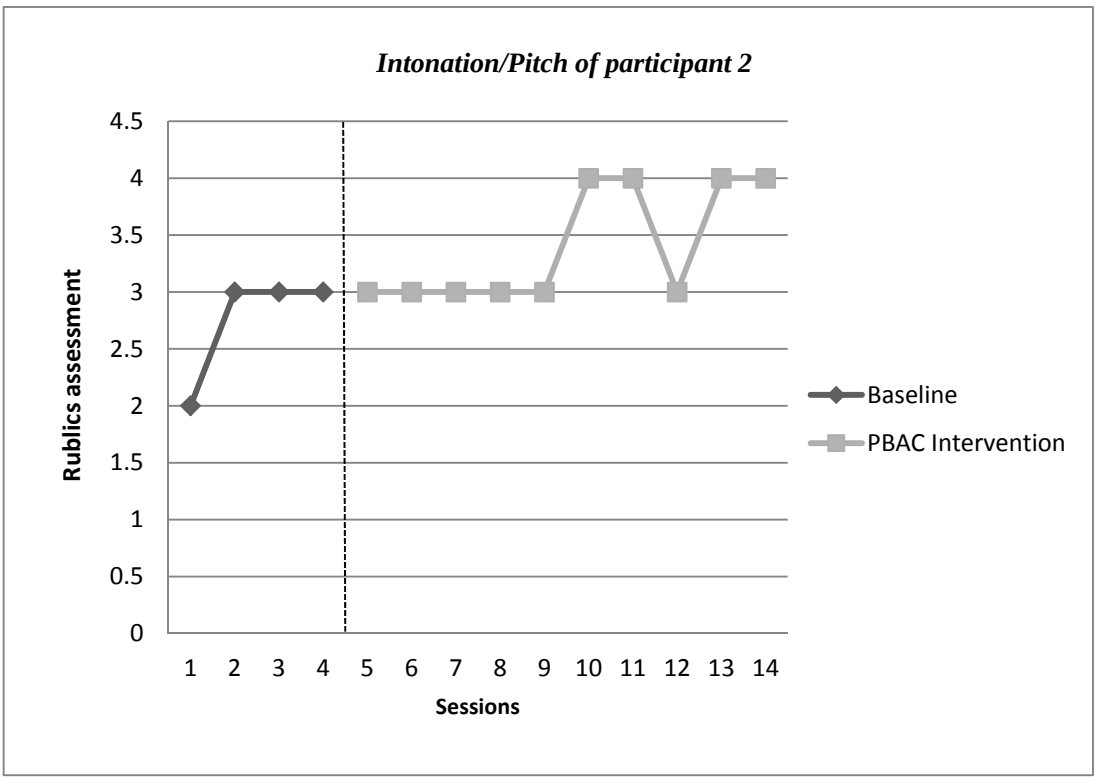


Figure 4.7 Rating scale's numbers of intonation/ pitch of participant 2: during baseline, and intervention sessions.

4.2.4 Tonal quality/ Interpretation

This section measures the quality texture of the sound that operates without unnecessary tension. Participant 2 was rated score 1 in her first session. The score of the2nd session was 2, and it remained stable until the last baseline session (4), with mean occurrence of 1.75 at the range of 1 to 2.Next, the first intervention session 5, the score remained the same from the baseline session, and remained stable until session 8. Session 8 was her first time to learn the new song, and the score was 2. The next session (9), the score slightly increased to 3, and remained stable until session 13. Additionally, her score was 4in session 14. The mean occurrence of tonal quality/ interpretation measurement was 3.3, with the range of 2 to 4, as shown in Figure 4.8.

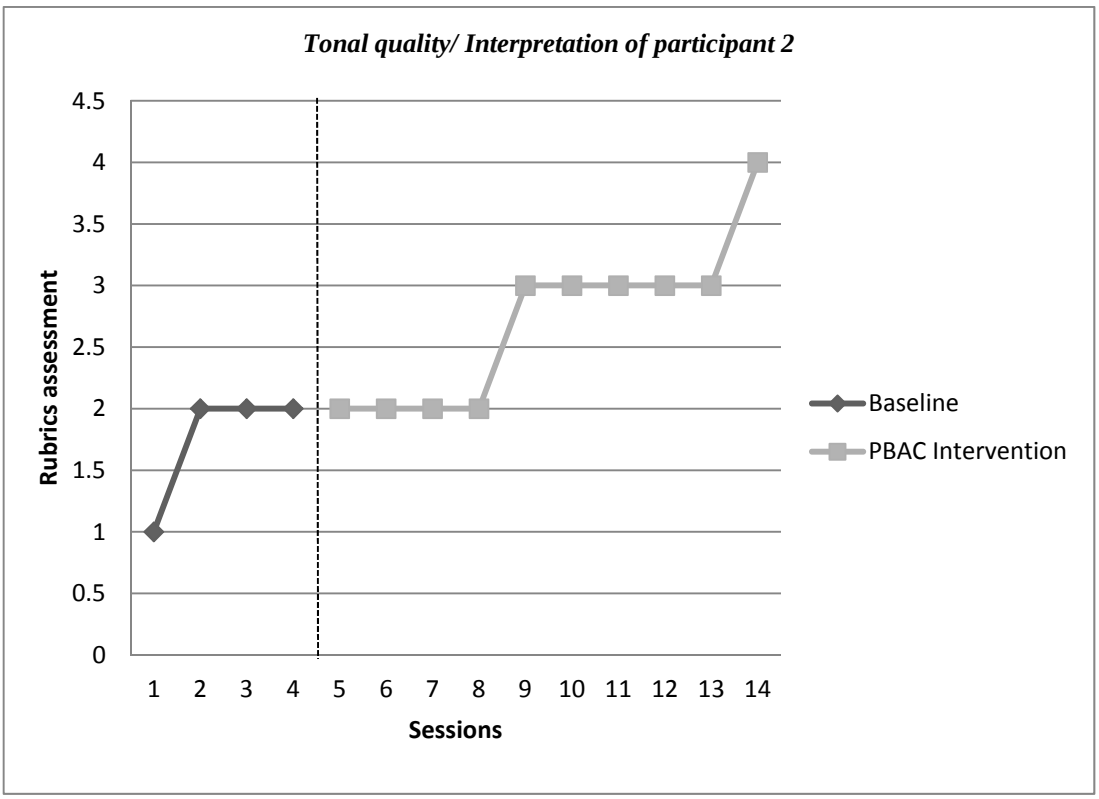


Figure 4.8 Rating scale's numbers of tonal quality/ interpretation of participant 2: during baseline, and intervention sessions.

CHAPTER V
DISCUSSION

The purpose of this study was to examine the progression of classical voice performance with voice students, who began to learn with classical voice lessons using a Pilates respiration-based classical vocal technique. The question of this study: Does Pilates respiration technique enhance classical-voice performance; breathing management, phrase duration, intonation/ pitch, and tonal quality/ interpretation of students? The study presented the implications of crucial-respiration mechanisms that help beginners improve expeditiously on their performances during the treatment periods. The Pilates respiration is an interpreter which represented the important role within phonation functions that contributed physically-mentally to the participant's awareness in adjusting the torso-regions for stimulating the reaction of muscles preparation.

This study employed the single case design to investigate in-depth by collecting data on the relationship of Pilates breathing-applied classical singing (PBAC) within individual voice lessons. The single case design allowed the study to choose a wide-range of samples; such as, male participant and adolescent-female participant. The (AB) design was included during the investigation. (A) applied to a baseline period and this study consisted of 4 session, and (B) applied to an intervention period and this study consisted of 10 sessions. The researcher collected data for all periods by recording the performances on video, and rated the scores of the participants' performances by Classical Voice Rubrics Assessment. In addition, inter-rater reliability was included to examine the reliability of the Classical Voice Rubrics Assessment, and the performance videos were randomly rated by two observers for 20% of all sessions.

This chapter presents the discussion of intervention results, which consisted of breathing management, phrase duration, intonation/ pitch, and tonal

quality/interpretation, the implications for classical voice teachers and music classical voice students, and recommendations for the further research.

5.1 The Pilates respiration-based classical vocal technique and breathing management

This topic presented the discussion about the outcome of PRBC and breathing management on two participants. Data collection in the baseline sessions evidenced that the scales range of 1 to 2, both participants had a difficulty in breathing and singing. According to the trends that show in figures 4.1 and 4.5, the participants had tension in their body during inhalations and throughout exhalation. While all participants inhaled, they elevated the upper chest and most tension was swathed at neck with audibility. This problem caused ineffective coordination of beneficial musculatures, which made it difficult to breathe deeply and their bodies were poorly imparted while singing. At this point, the two participants could not make their abdominals expand to refine the point of basic-comfortable inspiration. During the last baseline session, Participant 1 steadily remained at the same level in the breathing management. Participant 2progressed in breathing technique; nevertheless, participants still had inadequate inhalation and this caused them tension on neck and thoracic cavity areas. After the application of PRBC method during classical vocal sections, participant 1 developed the breathing technique to the scored 3 in the first session and remained stable until session 7th.He dropped to a 2 score at session 8, because the song changed and this appeared to steal away what he had learned in the previous song, such as, notes, vowels, consonants and breath management. He progressed the breathing management in 9th to 12thsessions and scored 3 and developed continuously to score 4 and5 in the last two sessions. Thus, he fully developed in body control with relaxation during his last intervention session. On the contrary, participant 2 had not developed the breathing management at the first intervention session. She developed the breathing control better in session 6 and remained stable with a score of 3until the 10thsession. Moreover, participant 2 positively progressed her breathing performance to score 4in the 11thsession and remained stable until the 14th session. In addition, during the individual sessions,

each participant was able to develop their breathing control in each session during learning hours. Thus, the research proved that Pilates could help singers improve their breathing performance as Friedlander (2015) stated, when he said that singers should emphasize on building up a substantial air collection and address the “pushing” tendency on their abdominals. Pilates-respiration training is a method that helps singer to sustain the breathing mechanism during stage performance. This is because the breathing technique supports the core-muscles exercises that systematize the joint of lower spine, hips and pelvis and balanced lower torso. Therefore, the training key of the Pilates is to strengthen and flexible the shoulders, upper torso, medium torso and lower torso that allow singers to release tensions. Additionally, in vocal pedagogy as Appelman (1986) summarized, the conceptual method of breathing control is very important to stabilize the physical adjustment. During singing if singers breathe to their upper chest that will cause tension in subglottic and the vocal fold will stay narrower. When this happens, the sound will cause restraining and it interferes with sound quality. Moreover, singers have to balance their breathing and stabilize the modification of sound level. For example, while sing fortissimo singers need a large amount of air pressure, and to sing pianissimo there is less need for air pressure, which affects the laryngeal and vocal mechanism. It is essential for students to gain more awareness and feel comfortable with their own body. Additionally, they are enabled to synchronize the classical voice technique with physical mobility, in order to start learning properly for early voice. Thus, the research results of this study have shown that Pilates breathing was beneficial for singers.

5.2 The Pilates respiration-based classical vocal technique and phrase duration

Phrase duration is used to evaluate the performance ability that participants to be able to sing through musical phrases. To sing through the four to five bars within a song, singers have to prepare the deep breath and let air pressure flow. While releasing the air singers tend to feel the lower abdominal muscles and related trunk muscles expanded, the chest expansion will be shrunken to normal position. Additionally, the abdominal muscle will not work properly while singer controls the breath

with pectoral musculature that causes diaphragm to move back quickly.(Miller, 1996). The result of visual analysis revealed the development of both participants performances. Participant 1 started with a score of 2 and remained at this level until the last baseline session. Although he took two intervention sessions, the result still remained at 2. There were some difficulties for him to engage the breathing modification to his muscle support. He had excessive tensions along his upper abdomen and that caused his neck tension, which caused the inconsistently balanced air emission. This caused his head tone to be limited and he regularly could not sing to the end of phrases. During these periods, he could follow the instructions, but there was some tension around his trunk muscles and this caused the sound to be restrained on his voice. Next, at session 10, he managed to sing through the phrases and control his breathing with less tension, but only with some difficulties on the long suspension notes. He improved the phrasing management continuously in the last two sessions to scored 4 and 5; because, he gained more awareness of the engagement between his breathing and controlling his musculature. This made his performances much more satisfactory at the last two sessions, which he sang through phrases with relaxation and naturally flowed.

For the participant 2, she remained with a score of 2from session 1st to session 6th because her breathing control was poorly managed and she could not controlled the related muscles properly. At this point, she improved on the phrasing control and scored 3 and remained stable from session 7 to session 12. Similarly, participant 2 spent a while to improve her performances. While practicing the exercises, she managed to take a deep breath with her diaphragmatic muscles but, she had a distraction from coordinating the force between expiration and phonations. Similarly, she made progress on the last two sessions, the 13th and 14th. At this scale participant 2 was able to more confidently understand the musical piece. She supplemented her performance with holding her breath effortlessly. Thus, this study proved that the PRBC method contributed to the participants' ability to control their singing phrases, as Asher (1997) found, writing about the importance of this method and concluding that the Pilates breathing method; pelvic floor C-Curve regular forced inhalations to singer by strengthening lumbar multifidus functioning with spinal vertebrae, the most important function of breathing is to empower the diaphragm and

engage the pelvic floor muscles to be more flexible. Moreover, this function strengthens the downward abdominal muscles that relate tranversus abdominis. Asher noted that in singing, respiratory is important as much as natural breathing; singers need active breathing that correlates the phonation mechanism. So, the effective breathe training helps singers to maximize high volume of air pressure by coordination between body and mind. In addition, Appelman (1986) summarized that singing need consistent breathing pressure to sustain the vocalization functions, the most important is expiration which makes phonatory effort and Miller (1996) clarified that the objective of breathing volition in singing which is necessary of all skill levels, the control of the force of the expiration is the key to controlling singing.

5.3 The Pilates respiration-based classical vocal technique and Intonation/ Pitch

During baseline sessions, two participants had difficulty with voice resonation. The two participants occasionally sounded restrained in their throat area and sounded out of tune (flat) while singing at a high pitch. On the other hand, they managed to sing on pitch at the lower and medium ranges. Participant 1scored 2from the1st to 3rdsessionand improved to a 3 score at the 4thsession. In these ranges, it was measured that he tried to combine his breathing musculature to support the head voice but still could not connect the right muscles to sing with head voice. During treatment session 5 and session 6, he still scored a 3. In these sessions he managed to breath deeper and he released the air pressure better than the previous weeks. This was because, Pilates help him to reduce the tensions around upper torso and shoulders as Striny (2007) when he wrote that while singers can reach all pitch ranges, when they reduce their body tension. Similarly, participant 2 started with a score of 2, and she progressed to 3 from her 2nd to her 4th session.. She could apply the principal of breathing and her voice register in falsetto improved. Her Intonation/ Pitch performance was scored 3 and remained stable until the 5th to 9thintervention sessions. During these sessions, she improved her deep inhalation, but there were issues about her muscular control, which made her exhalation release inconsistently

pressured. Because of this, she could not engage the exhalation to produce the suspension notes with vibrato properly, which caused some incorrect intonations. She progressed to a score of 4during the 10th. At this session, participant 2responded to the PRBC method and could combine her musculature control to sing as kinematic moderation. Thus, she was able to sing precisely in most pitches with confidence, but, there was some body and neck tension during her performances. During session 12, she dropped her performance level to sufficient, due to the fact that there was an inconvenient timeline that participant two could not come in as scheduled and postponed for four weeks. At this point, participant 2 felt uncomfortable with her musculature control and was unfamiliar with singing techniques. During the two last sessions, she was able to utilize the PRBC method to help control her body to produce accurate pitches. Her score progressed to a 4 at the intervention sessions 13 14, based on the effectiveness of PRBC and Intonation/ Pitch evaluation, consisting of accurate tunes, expressed naturally, and her comfortable singing. Additionally, the previous study demonstrated that the Pilates-based exercises were mainly helpful in improving active respiration for speaking and singing because the learner could improve physical flexibility and release the stiffness that usually occurred in other activities through breathing activity (Melton, 2016). Moreover, Brizick (2012) concluded that Pilates method in her singing class mainly contributed by freeing the head and neck from holding rigid, and reforming the core muscles to be strong and pliable. The purpose of this method was to decrease the exterior tensions and to activate the resonation cavities to allow singers to freely produce ringing registers. In addition, the vocal pedagogy concluded that the method established body-mind awareness that stabilized the muscles' duties and vocal mechanism and created a sturdy voice. As a result, the larynx rises up differently, blending while singing high notes rising, which makes the respiratory tract become tense and misshapen. While singing, the pitch was created by the vibration of vocal folds in the column of air. The edge of vocal chords is thin while singing high notes, and the edges of vocal chords are thicker while singing low. The cricoid muscles are the mechanism of head voice register, which controls the sizes of vocal folds while singing. This musculature function controls the direction of how vocal cords response back and forth in the larynx (Striny, 2007).

5.4 The Pilates respiration-based classical vocal technique and tonal quality/ interpretation

The study of the Pilates respiration-base on tonal quality interpretation included two participants. The result of this study demonstrated that, after receiving PRBC exercises, both participants showed the progression their vocal performance, including the principle of phonation and enabled them to modify these techniques instantly in the diversity-voice registers. This section involved a measure of the quality texture of the sound that operated without unnecessary tension. The head-sound production included head voice texture and chest voice texture that collaborated by Passaggio modification. This helped the participant to vocalize different voice expression, which consisted of light, medium, or deep sound texture. Moreover, the two registers were used to measure the participant's operating equilibrium.

Participant 1demonstrated head resonation and interpretation poorly at the first baseline session but improved to a score of 2 at the 2ndsession and remained at the same scale until the 3rdsession. He progressed to the score 3 at the last baseline session. In terms of breathing techniques, he had some difficulty breathing. As a result of this, he tried breathing deeply but his breathing was audible, which caused tension on his upper chest and lifted his shoulders Because of this, his voice performance had hoarseness textures on middle and higher pitches. His voice texture was in an unhealthy condition, due to the fact that there was some misunderstanding about the excessive brightness at his head resonation. He could not identify his voice properly while singing a classical song. Therefore, he tended to sing louder with his throat and sounding nasal, which added his tension on his upper body. This inappropriate posture caused the imbalance of pasaggio and vowel modification, such as, tone register, vowels, and pitches, but his interpretation was expressed with acceptable clarity on his performance. During the 5th and 6thintervention sessions, he remained ata score of 3in that he improved his breathing techniques by inhaling with inaudibility, and modified his breathing mechanism and combined to related musculatures better. The last session of his first song, participant 1 improved to an above average scale because he could breathe properly and adapted his breathing to deliver the frontal resonance and ring the head sound. He improved the performance to a 4 at session 7, which was his final performance of the first song. At this stage, he

was able to make the clearer ringing-head sound with less upper torso tension, there were only a few suspension notes that were hoarse sounding. Since the beginning of learning a new repertoire from session 8, his performance dropped to a score of 4, and his performance remained stable until session 11, because , he learned more about English vowels, adjusted his passagio modification, and he was more concerned about the rhythmic. At the end of the last three sessions he managed to improve his performances and scored 4. Moreover, during this period, participant 1 used the PRBC techniques to improve his related muscle control, and adapted this for singing. At the end of the session, when it was the time to perform; he was uncomfortable breathing and singing through the whole song. After few time performances, though, he managed to understand the elements of the song, and he had more confidence to breathe inaudibly and deeply. Therefore, his frontal and head resonation was comfortably controlled and produced clearly musical expression and interpretations.

In looking at to participant 2 results, she learned quickly with all exercises, and was able to control her trunk muscles to sing in each session better, such as, breathing exercise, voice acquisition of agility exercise, and classical-voice warming up. However, participant 2 was only average in combining these techniques to her performances because there was some difficulty in feeling familiar with her head resonance. While signing, she usually resonated her voice on subglottic and frontal regions, which made the sound frequency drop. Moreover, most of the time while she was singing the ending of suspension notes, she was poorly holding the pitches until the last beat, which caused her to sound off tune (Flat).During session

9, she improved her performance skills with tonal and interpretation in sufficient skill. During these sessions, she managed to sing head resonation better than informer sessions. She combined the PRBC active breathing to relax the upper torso, which made her middle and high voice registers brighten, but there were only few pitches sound hoarseness appeared in high range. Moreover, there was throat singing at the lower range, which was brighten on hear her voice. She showed more progressed at the last treatment session (14^{th}), and her scored was 4. As a result of, PRBC contributed her to relax the torsos and adapted the trunk musculature to control her breathing that she could produce better head resonation. Moreover, she abled to adjust to sing the lower and middle ranges with her chest mixtures and open chest

sound, that was provide voice dimensions clearly with different ranges. For the Pilates method, Melton (2016) explained that Pilates breathing can adjust to use for singing, which contributed the control of smooth breathing and stabilize the movements that help sustain the quality of voice tones. As the classical method, Breathing mechanism is necessary for student to understand and control it for developing properly in their early voice Breathing mechanism is necessary for student to understand and control it for developing properly in their early voice (Striny, 2007). Moreover, Miller (1996) supported that singing timbre focus on breathing to get the supports muscles to sing effectively on lower register in female.

5.5 Implications for classical voice teachers and classical voice students

Based on the data collections and result descriptions, it was suggested that this type of intervention could be necessary to assist classical-voice students to learn classical voice properly and avoid injury during vocalization. Additionally, the results represented that the Pilates respiration-based classical-vocal technique (PBRC) could enhance student vocal performances.

In terms of PRBC, voice instructors should be trained in the principle of the Pilates respiration method and Pilates exercises with a Pilates practitioner until they understand the components of the Pilates method and are proficient in transferring the principle of breathing techniques to others, or voice teachers could invite the Pilates practitioner to work alongside them prior to or during the voice studio classes. Thereafter, the voice teacher will be more concerned about the respiration function on their teaching. They will understand more about the breathing problems which students frequently experience. Moreover, because students usually inhale with lifting their shoulders and clavicle, causing tension of the upper body and causing subglottic tension the teacher should strictly observe the students to insure that they breathe properly, by allowing student to focus on respiration function, using PRBC. The teacher should not rush their student to focus on singing, then breathing from the beginning. Moreover, the teacher should allow students to feel their abdomen muscles expand laterally, and really feel the abdominal muscles working and hold the

position and hear the air pressure. For example, they might let students sing through technical verbiage, using “Ssss or Brrr”, voice consonant. In doing so, when the air flows properly, the teacher could hear. That teacher can check for and interrupted vocal tract and will realize student’s musculature if there is resistance during expiration.

In terms of Pilates respiration-based classical vocal technique, the classical voice student needs to understand the body functions that are related to singing. Students should be taking the principle of Pilates respiration lessons and the Pilates exercises with a Pilates practitioner. After that, voice students would discuss with their coach in order to understand about the vocalization and applying the PRBC in their practices. Additionally, student would be focused on how muscles work while breathing. Then, the student would be able to focus on their deep inspiration noiselessly, while holding down the lateral-abdominal muscles and maintaining a raised sternum. Additionally, students should feel comfortable with the upper part of their body and prepare properly on their pre-phonatory position, and then sing with diaphragmatic breathing. Most importantly, students will have to adjust their related techniques to these breathing exercises, such as, relaxing the jaw, relaxing the lips, relaxing and resting the tongue, opening the throat and lifting up their soft palate.

Based on the elements of PRBC, the researcher found that teaching strategies allowed students to experience with comfortable singing in classical style. The principle concept of this intervention was to investigate the musculature that was useful and worked efficiently for classical voice lessons. For this study, Pilates contributed by helping the student to experience the musculature mechanism during expiration. When students utilized the Pilates breathing techniques, they tended to focus on the respiration functions and muscle support more, and used it to be an important part of improving their singing when compared to their baseline sessions. Therefore, they became familiar with those musculatures and felt relaxed in the upper part of their body and balanced their posture. This process helped them to learn voice lessons more efficiently and avoid any larynx injury while retaining the correct posture during breathing exercises, vocal warming up/ exercise, and repertoire.

5.6 Recommendation for further research

Because this study employed an in-depth investigation of a single-case study, the number of participants was limited. The results of each participant were different, because the first participant was a tenor voice and the second participant was a soprano voice. This study did not use the cases-comparative method, thus, there was a limit to the age and quantity of the participants in order to find the percentages of improvement. In the future, the researcher may utilize more participants by employing the experimental study to classify an experimental group and a control group. Additionally, the researcher could identify the outcome and compare the progression between the two groups and may observe the pre-test and post-test scores of the target groups.

Based on the Pilates respiration-based classical vocal technique, there are many exercises that could be beneficial for a classical singer. The other exercises besides breathing techniques, include mat workouts that implement the body flexibility, fortify the torso muscles, and improve the posture alignment, with such exercises as rolling back, the roll up, rolling down the spine (mobility), the hundred, the swimming, the leg stretch, leg-pull prone, and the side bend, etc.

Future research may be conducted on the application of Pilates respiration on contemporary singing; such as vocal jazz and popular voice styles. The method could help them focus more about breathing concern and be able to adjust their singing techniques.

Moreover, the future research may conduct the Pilates-respiration system on the case-study analysis and employ the Narrative methods to describe the change of the case phenomena.

CHAPTER VI
CONCLUSION

The purpose of this study was to examine the Pilates respiration-based classical vocal technique in students' vocal performances. This intervention assessment had four criteria: 1) breathing management, 2) phrase duration, 3) intonation/ pitch, and 4) tonal quality/ timbre. The study employed the single-case research design. Indeed, the researcher utilized the Rubrics-assessment forms through the evaluation procedures. The participants in this study comprised one soprano and one tenor.

The data collection procedures extended over four months to carry out the four baseline and music stimuli sessions for each participant. The single-case study took place from September to December 2015. The data were gathered at the end of every session. This study included all baseline and intervention sessions. The baseline session took approximately 50 minutes for four sessions, and the intervention session took 60 minutes for 10 sessions. The location of this study was at the College of Music at Mahidol University for participant 1, and at the Musical Art Studio for participant 2.The researcher recorded the data using video recording in all baseline sessions and intervention sessions of the two participants. The Inter-rater reliability was employed to support this research instrument. This method highlighted the inter-rater agreement of this research instrument (rating scale: Classical Voice Rubrics Assessment) by allowing the expert to observe and examine randomly through video recording for (20%) of all the sessions.

The research strategy consisted of 5 procedures. To start with, the participants learned the Pilates respiration-based classical vocal technique. Secondly, the participants practiced the PBAC exercises to learn proper breathing techniques and to use proper musculatures to provide support during respiration. Thirdly, the participants learned the Voice-Acquisition of Agility lessons. This lesson guided the participants to sing with different vowels, which allowed them to experience pitch and

rhythmic patterns (Miller, 1996). Next, both participants learned vocal exercises (warming up). This procedure let the participants vocalize through the air pressure by starting the “onset” of Nasal Cavity, and to learn to sing head resonance by constantly changing the position of voice resonators. They modulated in different neighboring keys with a diversity of consonantal phonemes. The criterions of these exercises focused on the tonal qualities, and the dynamic and timbres. Finally, the participants learned the repertoires with standard classical literatures and aria that are required for beginners, which consisted of Italian: “Caro mio ben,” Latin: “Pie Jesu,” and English: “Steal away.”

The research results provided an effective tool to improve the participants’ performances within voice sections. This procedure demonstrated that the Pilates respiration-based classical vocal technique provides the vocalization preparation in classical singing by supplying the correct breathing and muscle supports throughout the singing lessons and voicing techniques. The Pilates respiration-based classical vocal technique was a practical method that enhances classical voice performances of participants. These participants learned the collaboration of the Pilates respiration and PRBC exercises in their classical singing. The stimulation covered the vocalization system that included sufficient breathing in singing skills. The importance of the breathing system led to the participants’ body and mind cooperation. Oftentimes, both participants lacked self-awareness during the singing preparation, especially the active respiration system that included breathing with lateral and intercostal breathing, with the diaphragmatic system that provided musculature support. In terms of classical voice performance, this intervention is an effective tool that helps apply the exercises to their principles. This helps them to start properly with classical singing as an on set-singing for beginners. Essentially, the use of Pilates respiration-based classical vocal technique assisted both participants in improving the breathing and muscle support functions. The PRBC intervention was a practical technique that has equipped the participants with breathing support, which includes breathing detention exercise that trains them to breathe deeply and resist the air pressure while exhaling with muscle support. Finally, this method improved the respiration and muscle competency, which play a big part in supporting the participants in their classical performances.

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APPENDICES

APPENDIX A
HUMAN SUBJECT APPROVAL DOCUMENT

Certificate of MU-SSIRB Approval

★★★★★★★★★★★★

Certificate of Approval No.:	2015/293.0109
MU-SSIRB No.:	2015/308 (B2)
Title of Project:	THE EFFECT OF PILATES RESPIRATION-BASED CLASSICAL VOCAL TECHNIQUE ON STUDENT VOCAL PERFORMANCE: A SINGLE-CASE STUDY
Principal Investigator:	MR. SETH KAMPIRANON
Name of Institution:	College of Music, Mahidol University
Approval Includes:	1) MU-SSIRB Submission form version received date 28 August 2015 2) Participant Information sheet version date 28 August 2015 3) Informed Consent Form version date 28 August 2015

The Committee for Research Ethics (Social Sciences) is in full compliance with International Guidelines of Human Research Protection such as Declaration of Helsinki, The Belmont Report, CIOMS Guidelines and the International Conference on Harmonization in Good Clinical Practice (ICH-GCP)

Date of Approval: September 1, 2015
Date of Expiration: August 31, 2016

Chairman

(Emeritus Professor Dr.Santhat Sermsri)

Head of the Institute

(Assoc.Prof.Dr.Wariya Chinwanno)
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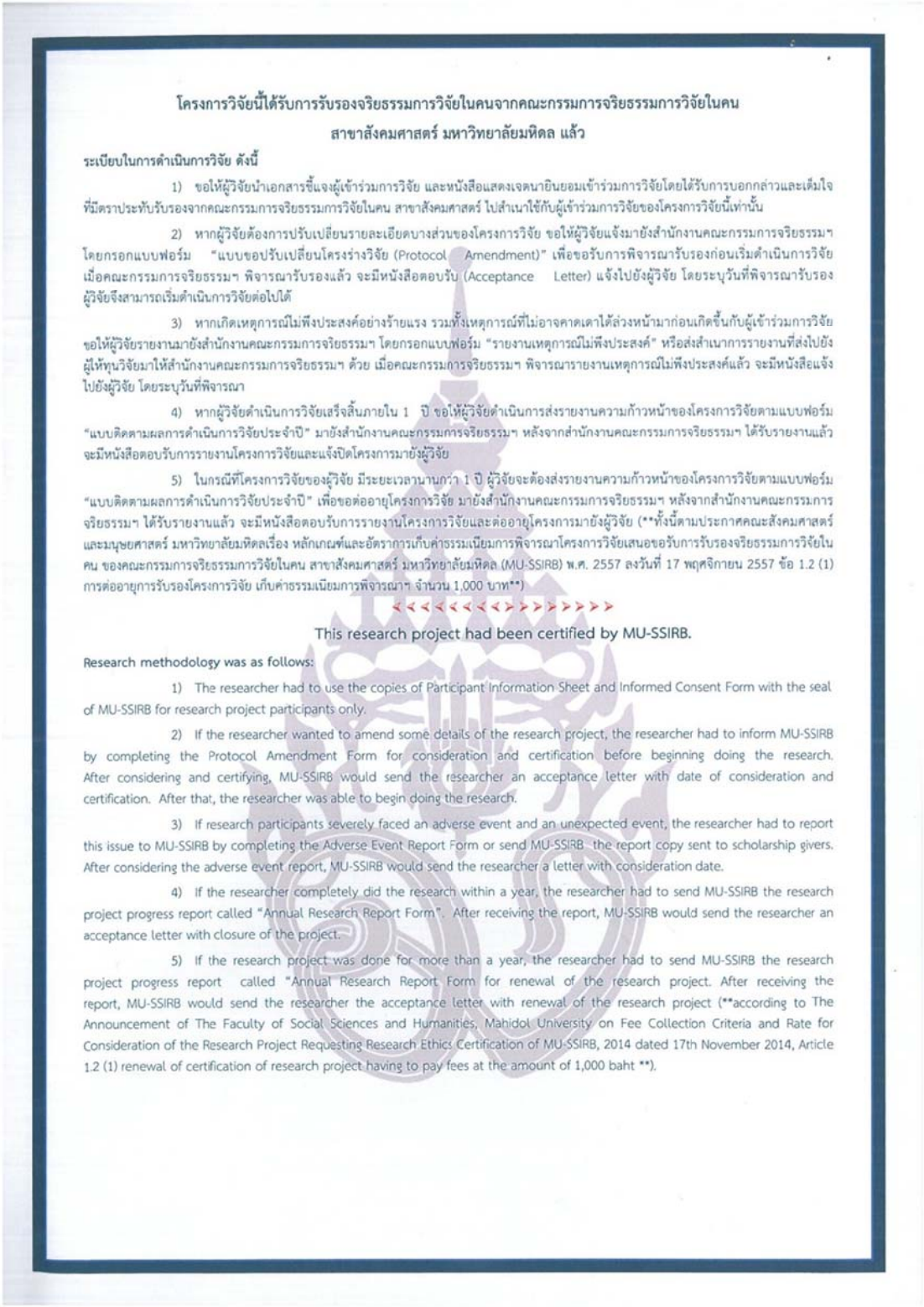


โครงการวิจัยนี้ได้รับการรับรองจริยธรรมการวิจัยในคนจากคณะกรรมการจริยธรรมการวิจัยในคน สาขาสังคมศาสตร์ มหาวิทยาลัยมหิดล แล้ว

ระเบียบในการดำเนินการวิจัย ดังนี้

1) ขอให้ผู้วิจัยนำเอกสารชี้แจงผู้เข้าร่วมการวิจัย และหนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัยโดยได้รับการบอกกล่าวและเต็มใจที่มีตราประทับรับรองจากคณะกรรมการจริยธรรมการวิจัยในคน สาขาสังคมศาสตร์ ไปสำเนาใช้กับผู้เข้าร่วมการวิจัยของโครงการวิจัยนี้เท่านั้น

2) หากผู้วิจัยต้องการปรับเปลี่ยนรายละเอียดบางส่วนของโครงการวิจัย ขอให้ผู้วิจัยแจ้งมายังสำนักงานคณะกรรมการจริยธรรมฯ โดยกรอกแบบฟอร์ม "แบบขอปรับเปลี่ยนโครงร่างวิจัย (Protocol Amendment)" เพื่อขอรับการพิจารณารับรองก่อนเริ่มดำเนินการวิจัย เมื่อคณะกรรมการจริยธรรมฯ พิจารณารับรองแล้ว จะมีหนังสือตอบรับ (Acceptance Letter) แจ้งไปยังผู้วิจัย โดยระบุวันที่พิจารณารับรอง ผู้วิจัยจึงสามารถเริ่มดำเนินการวิจัยต่อไปได้

3) หากเกิดเหตุการณ์ไม่พึงประสงค์อย่างร้ายแรง รวมทั้งเหตุการณ์ที่ไม่อาจคาดเดาได้ล่วงหน้ามาก่อนเกิดขึ้นกับผู้เข้าร่วมการวิจัย ขอให้ผู้วิจัยรายงานมายังสำนักงานคณะกรรมการจริยธรรมฯ โดยกรอกแบบฟอร์ม "รายงานเหตุการณ์ไม่พึงประสงค์" หรือส่งสำเนาการรายงานที่ส่งไปยังผู้ให้ทุนวิจัยมาให้สำนักงานคณะกรรมการจริยธรรมฯ ด้วย เมื่อคณะกรรมการจริยธรรมฯ พิจารณารายงานเหตุการณ์ไม่พึงประสงค์แล้ว จะมีหนังสือแจ้งไปยังผู้วิจัย โดยระบุวันที่พิจารณา

4) หากผู้วิจัยดำเนินการวิจัยเสร็จสิ้นภายใน 1 ปี ขอให้ผู้วิจัยดำเนินการส่งรายงานความก้าวหน้าของโครงการวิจัยตามแบบฟอร์ม "แบบติดตามผลการดำเนินการวิจัยประจำปี" มายังสำนักงานคณะกรรมการจริยธรรมฯ หลังจากสำนักงานคณะกรรมการจริยธรรมฯ ได้รับรายงานแล้ว จะมีหนังสือตอบรับการรายงานโครงการวิจัยและแจ้งปิดโครงการมายังผู้วิจัย

5) ในกรณีที่โครงการวิจัยของผู้วิจัย มีระยะเวลานานกว่า 1 ปี ผู้วิจัยจะต้องส่งรายงานความก้าวหน้าของโครงการวิจัยตามแบบฟอร์ม "แบบติดตามผลการดำเนินการวิจัยประจำปี" เพื่อขออายุโครงการวิจัย มายังสำนักงานคณะกรรมการจริยธรรมฯ หลังจากสำนักงานคณะกรรมการจริยธรรมฯ ได้รับรายงานแล้ว จะมีหนังสือตอบรับการรายงานโครงการวิจัยและต่ออายุโครงการมายังผู้วิจัย (**ทั้งนี้ตามประกาศคณะสังคมศาสตร์และมนุษยศาสตร์ มหาวิทยาลัยมหิดลเรื่อง หลักเกณฑ์และอัตราการเก็บค่าธรรมเนียมการพิจารณาโครงการวิจัยเสนอขอรับการรับรองจริยธรรมการวิจัยในคน ของคณะกรรมการจริยธรรมการวิจัยในคน สาขาสังคมศาสตร์ มหาวิทยาลัยมหิดล (MU-SSIRB) พ.ศ. 2557 ลงวันที่ 17 พฤศจิกายน 2557 ข้อ 1.2 (1) การต่ออายุการรับรองโครงการวิจัย เก็บค่าธรรมเนียมการพิจารณาฯ จำนวน 1,000 บาท**)

This research project had been certified by MU-SSIRB.

Research methodology was as follows:

1) The researcher had to use the copies of Participant Information Sheet and Informed Consent Form with the seal of MU-SSIRB for research project participants only.

2) If the researcher wanted to amend some details of the research project, the researcher had to inform MU-SSIRB by completing the Protocol Amendment Form for consideration and certification before beginning doing the research. After considering and certifying, MU-SSIRB would send the researcher an acceptance letter with date of consideration and certification. After that, the researcher was able to begin doing the research.

3) If research participants severely faced an adverse event and an unexpected event, the researcher had to report this issue to MU-SSIRB by completing the Adverse Event Report Form or send MU-SSIRB the report copy sent to scholarship givers. After considering the adverse event report, MU-SSIRB would send the researcher a letter with consideration date.

4) If the researcher completely did the research within a year, the researcher had to send MU-SSIRB the research project progress report called "Annual Research Report Form". After receiving the report, MU-SSIRB would send the researcher an acceptance letter with closure of the project.

5) If the research project was done for more than a year, the researcher had to send MU-SSIRB the research project progress report called "Annual Research Report Form for renewal of the research project. After receiving the report, MU-SSIRB would send the researcher the acceptance letter with renewal of the research project (**according to The Announcement of The Faculty of Social Sciences and Humanities, Mahidol University on Fee Collection Criteria and Rate for Consideration of the Research Project Requesting Research Ethics Certification of MU-SSIRB, 2014 dated 17th November 2014, Article 1.2 (1) renewal of certification of research project having to pay fees at the amount of 1,000 baht **).

APPENDIX B

CLASSICAL VOICERUBRICS ASSESSMENT CRITERIA

Instructor name: _____
Student name: _____
Repertoire: _____
Date & Times: _____

ASSESSMENT ITEMS	CRITERIA				
	1 Poor	**2 Minimal**	**3 Sufficient**	**4 Above Average**	**5 Excellence**
1)Breathing management	The student needs much improvement with their breathing and with neck muscle tension, and with shoulders and upper chest lifting.	The student occasionally manages to breathe deeper, but shows tension in the neck and breathes audibly.	The student manages to breathe deeply and inaudibly, but shows some tension in the neck.	The student breathes deeply and expands the abdominal support and ribcage laterally and air volume flows.	The student breathes deeply and expands the abdominal muscle and ribcage laterally, and relaxing on upper torso.
2)Phrase duration	The student regularly cannot hold the phrase until the end.	The student occasionally sings until the end of phrasing	The student can sing through the end all of the phrases, but is not smooth.	The student can sing effortlessly through the phrases.	The student can sing through the phrase effortlessly and with naturally flow.
3)Intonation/ Pitch	The student sings with many inaccurate pitches.	Pitch is mostly accurate but errors interrupted the performance	Pitch is precisely in tune with only few errors in pitches which do not interrupt the performance	The student sings confidently with accurate pitch.	The student sings precisely in tune, with natural expression effortlessly.
4)Tonal quality/ Interpretation	Student sings with hoarse character in middle and high ranges/ Student cannot interpret the right tone of bright, medium, deep, and smooth within music literature.	Student sings clearly with head voice in the middle range but sounds hoarse in the higher registers/ Student has ability to sing in tones of bright, medium, deep, and smooth, but lacks quality in some sections.	Student sings clearly with head voice in the middle and upper ranges, but with some hoarseness/ Student manages to interpret proper tone; bright, medium and smooth, according to music literature.	Student sings clearly in all ranges with head voice register and delivers with comfortable singing voice. / Student is able to sing with clear tones of bright, medium, deep, and smooth within song	Student sings clearly in all ranges with head register and full resonation, with comfort and relaxed body alignment / Student expresses precisely with emotion tones of bright, medium, deep, and smooth on the passaggio modifications.

CLASSICAL VOICE RUBRICS ASSESSMENT FORM

Instructor name: _____
Student name: _____
Repertoire: _____
Date & Times: _____

ASSESSMENT ITEMS	CRITERIA				
	1 Poor	**2 Minimal**	**3 Sufficient**	**4 Above Average**	**5 Excellent**
1. Breathing management					
2. Phrase durations					
3. Intonation/Pitch					
4. Tonal quality/ Interpretation					
Total					

Comment/Recommendation

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

APPENDIX C
PILATES RESPIRATION-BASED CLASSICAL-VOCAL LESSON PLANS

Regular Classical Voice session (Baseline: A)

Goal

Enhancing the vocal performance skills

Learning objective

The student can be able to improve classical voice singing, which includes: breathing management, phrase duration, intonation/ pitch, tonal quality/ interpretation skills.

Contents

Breathing techniques and exercises: breathing is very important in order for the singer to sing effectively that synchronized diaphragmatic breathing and abdominals as a system. The method of this lesson leads the student to understand the engagement of the breathing system, which includes lateral breathing that expands the ribcage to allow the air volume into the lungs. Moreover, afterward, the student should be able to expand the ribcage correctly, having learned to inhale and exhale as an diaphragmatic action by pushing the abdominal muscles downwardly and remain firmly on that muscle's position. Thus, student is able to release the air pressure consistently.

The acquisition of agility method by *The structure of singing system and art in vocal technique* (Miller, 1996).The student has to combine lateral breathing and diaphragmatic actions in this method by singing through simplistic melodies and phonetic vowels by starting from exercise 1, and only one sequence per session with clear head register.

Vocal warming up and exercises are the methods that allow the student to sing through different alphabets and vowels to allow him/her to project the sound with different registers; for example, nasal, frontal forehead, full head, chest, and mixed register (passagio modification).

Repertoires/ *"Caro mio ben"* is first aria that allows the student to learn with melodic patterns and sing with simplistic diphthong, alphabet, vowels with consonants.

Session 1

Baseline: classical voice lesson

Learning objectives

1. Student can breathe deeply through diaphragmatic function for 2 of 5 trials.
2. Student can vocalize onset through the acquisition of agility exercises with clear head tonal quality for 1 of 3 trials.
3. Student can sing the major scale with head tonal quality for low voice to middle voice.
4. Student can sing the melodies of "Caro mio ben" correctly for 3 phrases.

Procedure:

Introduction:

1. The teacher introduces the classical voice production to the participants.
2. The teacher explains the significance of the respiratory system

Learning activities:

1. The teacher teaches student to control breathing through diaphragmatic breathing exercises by standing and inhaling and exhaling through mouth and relaxing the body by holding the position by breath exercises (Sssss and Brrrr) 3-5 times per session.

2. The teacher teaches student to sing vocal onsets through the acquisition of agility exercises by relying on diaphragmatic breathing and lower abdominal support by exercise 3.1 (sequence 1), by modulating into diversity of keys change.

3. Student stands and sings the major-scale exercises with a diversity of key changes, with relaxation but properly controlling breathing support by modulating into diverse keys shifts through lateral vowels into rounded vowels and adjusting into different vowels from low voice to middle voice.

4. Student learns repertoire (Caro mio ben) and sings through above breathing method by singing the pitches with (O) and (R) of song “Caro mio ben”.

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant’s learning cognition by reviewing the weak and strong points.

Materials:

- Piano, sheet music, voice exercises and songs sheets.

Assessment:

-The teacher observes classical vocal skills from participants in studio.

-The teacher observes classical vocal skill of participants from video and scores them using the Classical Voice Rubrics Assessment.

Session 2

Baseline: classical voice lesson

Learning objective:

1. Student can breathe deeply through diaphragmatic function in 3 of 5 trials.

2. Student can vocalize onset through the acquisition of agility exercises with clear head tonal quality in 2 of 3 trials.

3. Student can sing the major scale with head tonal quality for low voice to middle voice.

4. Student can sing the melodies of “Caro mio ben” correctly for 6 phrases.

Procedure:

Introduction:

1. The teacher reviews the previous lessons and introduces the vocal exercises to the participants.

2. The teacher explains the significant of respiratory system with new exercises.

Learning activities:

1. The teacher teaches participants to learn breathing control and exercises, including diaphragmatic breathing, by standing and trying to release their breath during exercises (Sssss and Brrrr).

2. The teacher teaches participants to perform vocal onset of the acquisition of agility at exercise 3.1 (sequence 2), with modulation into diverse keys change.

3. The teacher teaches participants to sing vocal warm-ups and exercises through major scale, modulating into diverse keys and shifting through lateral vowels into rounded vowels and adjusting into different vowels from low voice, middle voice, and into middle high voice.

4. The teacher teaches participants to learn repertoire by Singing the song's pitches with alphabets (O and R) next (A and E) of song "Caro mio ben".

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant's learning cognition by reviewing the weak and strong points.

Material:

-Piano, sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes classical vocal skills from participants in studio.

- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

Session 3

Baseline: classical voice lesson

Learning objective:

1. Students can breathe deeply through diaphragmatic function in 3 of 5 trials.

2. Student can vocalize onset through the acquisition of agility exercises with clear head tonal quality in 2 of 3 trials.

3. Student can sing the major scale with head tonal quality for low voice through middle voice.

4. Student can sing the melodies through alphabet A and E of “Caro mio ben” correctly for all phrases.

Procedure:

Introduction:

1. The teacher reviews the previous lessons and introduces the vocal exercises to the participants.

2. The teacher emphasizes respiratory system with new exercises.

Learning activities:

1. The teacher teaches participants to learn breathing control and exercises, including diaphragmatic breathing by standing and trying to release their breath during exercises (Sssss and Brrrr).

2. The teacher teaches participants vocal onset of the acquisition of agility at exercise 3.2 (sequence 1), with modulation into diverse keys changes.

3. The teacher teaches participants vocal warm-ups and exercises by singing major scales modulating into diverse key shifts through lateral vowels into rounded vowels and adjusting into different vowels from low voice, middle voice, and into middle high voice.

4. The teacher teaches participants repertoire by singing the pitches with alphabets (A and E) and sing through the words of “Caro mio ben”.

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant's learning cognition by reviewing the weak and strong point.

Material:

- Piano, sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes classical vocal skills from participants in studio.

- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

Session 4

Baseline: classical voice lesson

Learning objective:

1. Student can breathe deeply through diaphragmatic function in 5 of 10 trials.

2. Student can sing the onset through the acquisition of agility exercises with clear head tonal quality in 3 of 5 trials.

3. Student can sing the major scale with head tonal quality for low voice through middle voice and high voice.

4. Student can sing precisely on pitches with alphabet (R) and sing with the wording and musical components of "Caro mio ben".

Procedure:

Introduction:

1. The teacher reviews the previous lessons and introduces the vocal exercises to the participants.

2. The teacher emphasizes the respiratory system in middle and high voices.

Learning activities:

1. The teacher teaches participants breathing control and exercises by singing through diaphragmatic breathing, by standing and trying to release their breath

During exercises (Sssss and Brrrr).

2. The teacher teaches participants vocal onset of the acquisition of agility at exercise 3.2 (sequence 2), with modulation into diverse key changes.

3. The teacher teaches participants vocal warm-ups and exercises for major scale modulation into diverse keys, shifting through lateral vowels into rounded vowels and adjusting into different vowels from low voice, middle voice, and into high voice.

4. The teacher teaches participants repertoire by singing the pitches with alphabet (R) and singing with the wording and musical components of "Caro mio ben".

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant's learning cognition by reviewed the weak and strong points.

Material:

- Piano, sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes classical vocal skills from participants in studio.

- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

The principle and rational of lesson plan and for intervention

Phase (B): PRBC

Goal

Enhancing the vocal performance skills

Learning objective

The student can be able to engage the PRBC technique and improve classical voice singing, which includes: breathing management, phrase duration, intonation/ pitch, tonal quality/ interpretation skills.

Contents

The PRBC intervention is the method that elevates singers' body control and their musical focus. This experimentation consists of four stages; 1) lateral breathing, 2) diaphragmatic breathing on neutral supine, 3) pelvic floor muscle engagement, and 4) integration exercises.

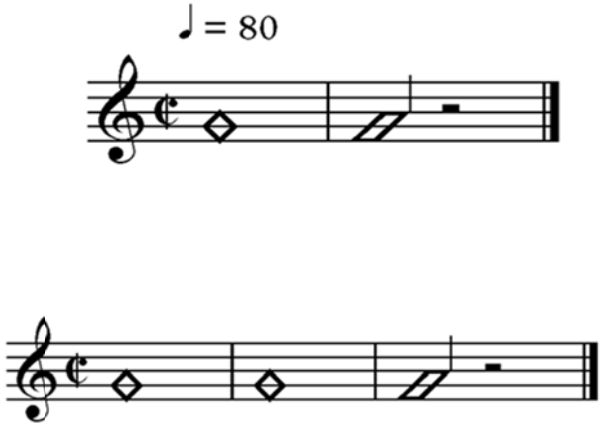
Integration exercises allow the student to focus on the breath management without phonation; the inhalation must be silent. Secondly, the participant combines the three stages of breathe management and passes through exercises that contribute to the diaphragmatic function and the muscles-support mechanism. This PRBC exercise includes three levels.

First: PRBC Breathing Detention

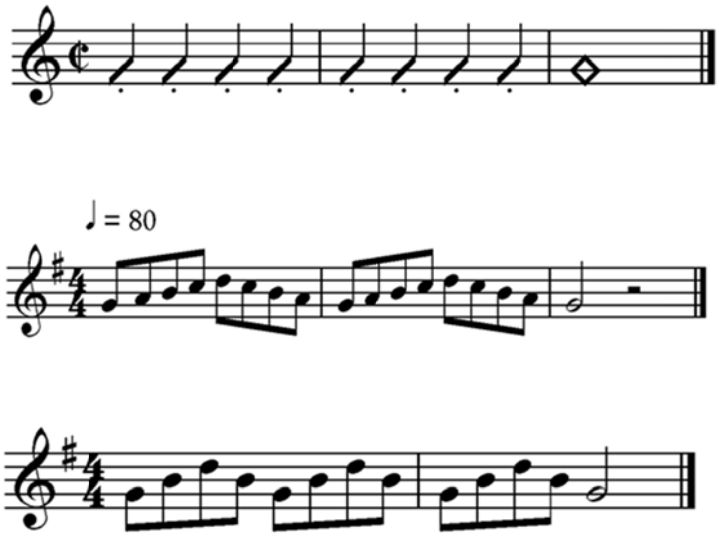
PRBC Breathing Detention		
Inhalation	**Detention**	**Exhalation**
12345	**12345**	**12345**
1234	**1234**	**1234**
123	**123**	**123**
12	**12**	**12**
1	**1**	**1**

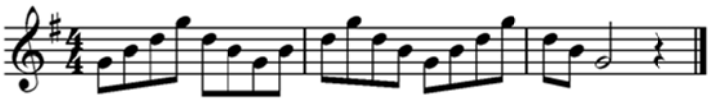
Second: Breathing management

These exercises were designed for developing the breath management without notation. Participants sustain the breathing into sounding (Ssss) until the ending beat for three levels. The second method allows participants to control higher air pressure by managing the breathing into sound (Brrr), with the lips rolling form.



Third: Singing by pushing abdominals at the "pubic region" outwardly during the exhalation along with every staccato beat and whole beat.





-The acquisition of agility method by the structure of singing system and art in vocal technique (Miller, 1996). The student has to combine lateral breathing and diaphragmatic actions to this method by singing through simplistic melodies and phonetic vowels, by starting from exercise 3, and only one sequence per session with clear head voice.

-Vocal warm-ups and exercises is the method that allows students to sing through different alphabets and vowels to allow him/her to project the sound with different registers, for example: nasal, frontal forehead, full head, chest, and mixed register (passagio modification).

Repertoires:

-Steal away- is an English repertoire that allows student to learn with melodic patterns and singing with English pronunciation that allows students to improve the opening of their lips and jaw that moves differently from Italian, which includes the diphthong, alphabet, vowels with consonants.

-Pie Jesu- is a Latin repertoire with a higher key than the first song. This piece allows the student to continue developing the tonal quality that has a characteristic which is very similar to Italian voice shape and consonant.

Session 5

Intervention session: PRBC

Learning objective:

1. The student can breathe deeply with the methods of Pilates respiration technique, and PRBC exercises with their singingin2 of 5 trails.

2. Student can sing with integration exercises which include the Pilates respiration methods with consistent air flow in 2 of 5 trials.

3. Student can sing the vocal onset through the acquisition of agility exercises with clear head tonal quality in3 of 5 trials.

4. Student can sing the major scale with head tonal quality for low voice through middle voice and high voice.

5. Student can sing precisely with the wording and musical components of the song “Caro mio ben”.

Procedure:

Introduction:

1.The teacher introduces the lesson contents to the participant.

2.The teacher explains the importance of Pilates-respiratory method and singing techniques

Learning activities:

1. The teacher teaches student the PRBC method and exercises with respiration techniques, including lateral breathing, diaphragmatic breathing neutral supine.

2. Teacher teaches student with integration exercises that include the Pilates respiration methods by standing and trying to release their breath into exercises (Sssss and Brrrr).

3. The teacher teaches student vocal onset of the acquisition of agility at exercise 3.3 (sequence 1), with modulation into diverse key changes.

4. The teacher teaches student to learn vocal warm-ups and exercises with major scale modulation into diverse key shifts through lateral vowels into rounded vowels and adjusting into different vowels from low voice, middle voice, and into high voice.

5. The teacher teaches student the repertoire; “Caro mio ben” and singing with meaning the words and musical components.

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant’s learning cognitive by reviewing the weak and strong points.

Material:

- Gym mat, towel and a bottle of water
- Piano sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes classical vocal skills from participants in studio.

- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

Session 6

Intervention session: PRBC

Learning objective:

1. The student can breathe deeply with the methods of Pilates respiration technique, and PRBC exercises with their singing in 3 of 5 trails.

2. Student can sing with integration exercises that included the Pilates respiration methods with consistent air flow in 3 of 5 trials.

3. Student can sing the vocal onset through the acquisition of agility exercises with clear head tonal quality in3 of 5 trials.

4. Student can sing the major scale with head tonal quality for low voice through middle voice and high voice.

5. Student can interpret sing precisely with the wording and musical components the song “Caro mio ben”.

Procedure:

Introduction:

1. The teacher reviews the previous lesson and introduces the lesson contents to the participant.

2. The teacher explains and reviews the importance of Pilates-respiratory method and singing techniques, which includes the different vowels from low voice, middle voice, and into high voice.

Learning activities

1. The teacher teaches participants the PRBC method and exercises, which include Pilates respiration techniques, including lateral breathing, diaphragmatic breathing neutral supine, and pelvic floor muscle engagement.

2. The teacher teaches integration exercises, which include the Pilates respiration methods by allowing student to standing and trying to release their breath into exercises (Sssss and Brrrr).

3. The teacher teaches student vocal onset of the acquisition of agility at exercise 3.3 (sequence 2), with modulation into diverse key changes.

4. The teacher teaches student vocal warm-ups and exercises by singing major scale modulating into diverse key shifts through lateral vowels into rounded vowels and adjusted into different vowels from low voice, middle voice, and into high voice.

5. The teacher teaches student repertoire with “Caro mio ben” through interpretation the of song’s components.

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant’s learning cognition by reviewed the weak and strong points.

Material:

- Gym mat, towel and a bottle of water
- Piano sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes classical vocal skills from participants in studio.
- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

Session 7

Intervention session: PRBC

Learning objective:

1. The student can breathe deeply with the methods of Pilates respiration technique, and PRBC exercises with their singing in 3 of 5 trails.

2. Student can sing with integration exercises that included the Pilates respiration methods with consistency air flow in3 of 5 trials.

3. Student can sing the vocal onset through the acquisition of agility exercises with clear head tonal quality in3 of 5 trials.

4. Student can sing precisely the major scale with head tonal quality for low voice through middle voice and high voice.

5. Student can interpret song precisely with the timbre and musical components of song “Caro mio ben”.

Procedure:

Introduction:

1.The teacher reviews the previous lesson and introduces the lesson contents to the participant.

2. The teacher explains and reviews the importance of the Pilates-respiratory method and singing techniques during singing with different registers.

Learning activities:

1.The teacher teaches student the PRBC method and exercises, which include Pilates respiration techniques, including lateral breathing, diaphragmatic breathing neutral supine, and pelvic floor muscle engagement.

2. Teacher teaches integration exercises that include the Pilates respiration methods by standing and trying to release their breath into exercises of (Sssss and Brrrr).

3. The teacher teaches student to learn vocal onset of the acquisition of agility at exercise 3.3 (sequence 3), with modulation into diverse key changes.

4. The teacher teaches student vocal warm-ups and exercises through major scale modulation into diverse key shifts through lateral vowels into rounded vowels and adjusted into different vowels from low voice, middle voice, and into high voice.

5. The researcher teaches the song through interpretation of the song components of “Caro mio ben”, which include timbre and interpretation.

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant’s learning cognition by reviewing the weak and strong points.

Material:

- Gym mat, towel and a bottle of water

- Piano sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes classical vocal skills from participants in studio.

- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

Session 8

Intervention session: PRBC

Learning objective:

1. The student can breathe deeply with the methods of Pilates respiration technique, and PRBC exercises with their singing in 5 of 10 trails.

2. Student can sing with integration exercises that include the Pilates respiration methods with consistent air flow in 4 of 5 trials.

3. Student can sing the vocal onset through the acquisition of agility exercises with clear head tonal quality in 4 of 5 trials.

4. Student can sing precisely the major scale with head tonal quality for low voice through middle voice and high voice.

5. Student can sing a new piece by singing the (O and R) along with song melodies precisely for 4 phrases of “Steal away”.

Procedure:

Introduction

1.The teacher reviews the previous lessons and introduces the new lesson contents to the participant.

2.The teacher explains and reviews the importance of the Pilates-respiratory method and singing techniques on passaggio modification.

Learning activities

1. The teacher teaches student the PRBC method and exercises, which include Pilates respiration techniques, including lateral breathing, diaphragmatic breathing

neutral supine, and pelvic floor muscle engagement.

2. The teacher teaches integration exercises that include the Pilates respiration methods by allowing the student to stand and try to release their breath into exercises of (Sssss and Brrrr).

3. The teacher teaches student vocal onset of the Acquisition of agility at exercise 3.4 (sequence 2), with modulation into diverse key changes.

4. The teacher teaches students to learn vocal warm-ups and exercises through major scale modulation into diverse key shifts through lateral vowels into rounded vowels and adjusting into different vowels from low voice, middle voice, and into high voice.

5. The teacher teaches a new piece by singing the (O and R) along with songs' melodies; Participant 1 will sing "Steal away" and participant 2 will sing "Pie Jesu"

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant's learning cognition by reviewing the weak and strong points.

Material:

- Gym mat, towel and a bottle of water
- Piano sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes classical vocal skills from participants in studio.
- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

Session 9

Intervention session: PRBC

Learning objective:

1.The student can breathe deeply with the methods of Pilates respiration technique, and PRBC exercises with their singing in 5 of 10 trails.

2. Student can sing with integration exercises that included the Pilates respiration methods with consistency air flow in 4 of 5 trials.

3. Student can sing the vocal onset through the acquisition of agility exercises with clear head tonal quality in4 of 5 trials.

4. Student can sing precisely the major scale with head tonal quality for low voice through middle voice and high voice.

5. Student can sing precisely with alphabets (A and E) along with song's melodies

Procedure:

Introduction:

1. The teacher introduces the lesson contents to the participant.

2. The teacher explains and reviews the importance of the Pilates-respiratory method and singing techniques on different vowels and registers.

Learning activities:

1. The teacher teaches student the PRBC method by including lateral breathing, diaphragmatic breathing neutral supine, and pelvic floor muscle engagement.

2. The teacher teaches student integration exercises that include the Pilates respiration methods by standing and trying to release their breath into exercises of (Sssss and Brrrr).

3. The teacher teaches student vocal onset of the acquisition of agility at exercise 3.4 (sequence 3), with modulation into diverse key changes.

4. The teacher teaches vocal warm-ups and exercises and singing major scale by modulating into diverse key shifts through lateral vowels into rounded vowels and adjusting into different vowels from low voice, middle voice, and into high voice.

5.The teacher teaches student repertoire by singing with the alphabets (A and E) along with song's melodies, and the participants will start to learn the words and meaning of these songs:

Participant 1 will sing "Steal away" and

Participant 2 will sing "Pie Jesu"

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant's learning cognition by reviewing the weak and strong points.

Material:

- Gym mat, towel and a bottle of water

- Piano sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes classical vocal skills from participants in studio.

- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

Session 10

Intervention session: PRBC

Learning objective:

1. The student can breathe deeply with the methods of the Pilates respiration technique, and PRBC exercises with their singing in6 of 10 trails.

2. Student can sing with integration exercises that included the Pilates respiration methods with consistency air flow in 5 of 5 trials.

3. Student can sing the vocal onset through the acquisition of agility exercises with clear head tonal quality in5 of 5 trials.

4. Student can sing precisely the major scale with head tonal quality for low voice through middle voice and high voice.

5. Student can precisely sing the alphabets (R) along with song's melodies, and the participants will sing correctly with word, and musical components.

Procedure:

Introduction

1. The teacher introduces the lesson contents to the student.

2. The teacher explains and reviews the importance of the Pilates-respiratory method and singing techniques which include the lyrics, and musical components

Learning activities

1. The teacher teaches student the PRBC method that includes lateral breathing, diaphragmatic breathing neutral supine, and pelvic floor muscle engagement.

2. Teacher introduces and combines the method integration exercises that include the Pilates respiration methods by standing and trying to release their breath into exercises of (Sssss and Brrrr).

3. The teacher teaches student vocal onset of the acquisition of agility at exercise 3.5 (sequence 1), by modulating into diverse key changes.

4. The teacher teaches student to sing tonal quality of vocal warm-ups and exercises. The participant will learn to sing major scale modulating into diverse key shifts through lateral vowels into rounded vowels and adjusted into different vowels from low voice through middle voice and into high voice.

5. The teacher teaches student the repertoire by singing the alphabets (R) along with song's melodies, and the participants will sing correctly with word, and musical components;

Participant 1 will sing "Steal away" and

Participant 2 will sing "Pie Jesu"

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant's learning cognition by reviewing the weak and strong points.

Material:

- Gym mat, towel and a bottle of water
- Piano sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes the progress from participant within studio.

- The teacher observes classical vocal skill from participant from video and scores them through Classical Voice Rubrics Assessment.

Session 11

Intervention session: PRBC

Learning objective:

1. The student can breathe deeply with the methods of Pilates respiration technique, and PRBC exercises with their singing in 7 of 10 trails.

2. Student can sing with integration exercises that included the Pilates respiration methods with consistency air flow in 6 of 10 trials.

3. Student can sing the vocal onset through the acquisition of agility exercises with clear head tonal quality in 6 of 10 trials.

4. Student can sing precisely the major scale with head tonal quality for low voice through middle voice and high voice.

5. Student can sing precisely sing correctly with word, musical components, understand the meaning, and interpret of the song.

Procedure:

Introduction:

1. The teacher introduces the lesson contents to the student.

2. The teacher explains and reviews the importance of the Pilates-respiratory method and singing techniques

Learning activities

1. The teacher teaches student the PRBC method that includes lateral breathing, diaphragmatic breathing neutral supine, and pelvic floor muscle engagement.

2. The teacher teaches student to learn breathing techniques and vocal onset of integration exercises the PRBC methods by standing and trying to release their breath into exercises of (Sssss and Brrrr).

3. Vocal onset of the acquisition of agility at exercise 3.5 (sequence 1), with modulation into diverse key changes.

4. The teacher teaches student vocal warm-ups and exercises to improve the tonal quality in different ranges. The participant will learn to sing major scale and arpeggio scale modulating into diverse key shifts through lateral vowels into rounded vowels and adjusted into different vowels from low voice, middle voice, and into high voice.

5. The teacher teaches student repertoire by singing the alphabets (O) along with song's melodies, and the participants will sing correctly with word, musical components, understand the meaning, and interpret of the song:

Participant 1 will sing "Steal away" and

Participant 2 will sing "Pie Jesu"

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant's learning cognition by reviews the weak and strong points.

Material:

- Gym mat, towel and a bottle of water
- Piano, sheet music, voice exercises and songs sheets.

Assessment

- The teacher observes classical vocal skills from participants in studio.
- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

Session 12

Intervention session: PRBC

Learning objective:

1. The student can breathe deeply with the methods of Pilates respiration technique, and PRBC exercises with their singing in 7 of 10 trails.

2. Student can sing with integration exercises that included the Pilates respiration methods with consistency air flow in6 of 10 trials.

3. Student can sing the vocal onset through the acquisition of agility exercises with clear head tonal quality in 6 of 10 trials.

4. Student can sing precisely the major scale with head tonal quality for low voice through middle voice and high voice.

5. Student can sing correctly with word, musical components, understand the meaning, and interpret the song.

Procedure:

Introduction:

1. The teacher introduces the lesson contents to the participant

2. The teacher explains and reviews the importance of the Pilates-respiratory method and singing techniques.

Learning activities:

1. The teacher teaches student the PRBC method by including lateral breathing, diaphragmatic breathing neutral supine, and pelvic floor muscle engagement.

2. The teacher teaches student integration exercises that include the Pilates respiration methods by standing and trying to release their breath into exercises of (Sssss and Brrrr).

3. The teacher teaches student the vocal onset of the acquisition of agility at exercise 3.5 (sequence 2), with modulation into diverse key changes.

4. The teacher teaches student vocal warm-ups and exercises: the student will learn to sing arpeggio scale and modulate into diverse key shifts through lateral vowels into rounded vowels and adjusted into different vowels from low voice, middle voice, and into high voice (O, R, & A).

5. The teacher teaches repertoire by assigning student to sing the alphabets (E) along with song's melodies, and the participants will sing correctly with word, musical components, understand the meaning, and interpret of the song ;

Participant 1 will sing "Steal away" and

Participant 2 will sing "Pie Jesu"

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant's learning cognition by reviewing the weak and strong points.

Material:

- Gym mat, towel and a bottle of water.
- Piano sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes classical vocal skills from participants in studio.
- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

Session 13

Intervention session: PRBC

Learning objective:

1. The student can breathe deeply with the methods of Pilates respiration technique, and PRBC exercises with their singing in8 of 10 trails.

2. Student can sing with integration exercises that included the Pilates respiration methods with consistency air flow in 8 of 10 trials.

3. Student can sing the vocal onset through the acquisition of agility exercises with clear head tonal quality in 8 of 10 trials.

4. Student can sing precisely the major scale with head tonal quality for low voice through middle voice and high voice.

5. Student can sing correctly with word, musical components, and interpret the song with understanding.

Procedure:

Introduction:

1. The teacher introduces the lesson contents to the participant.

2. The teacher explains and reviews the importance of the Pilates-respiratory method and singing techniques with different vowels from low voice, middle voice, and into high voice.

Learning activities:

1. The teacher teaches student the PRBC method by including lateral breathing, diaphragmatic breathing neutral supine, and pelvic floor muscle engagement.

2. The teacher teaches student with integration exercises that include the Pilates respiration methods by standing and trying to release their breath into exercises of (Sssss and Brrrr).

3. The teacher teaches student with vocal onset of the acquisition of agility at exercise 3.6 (sequence 1 and 2), with modulation into diverse key changes.

4. The teacher teaches student to sing vocal warm-ups and exercises: the participant will learn to sing arpeggio scale by modulating into diverse key shifts through lateral vowels into rounded vowels and adjusted into different vowels from low voice, middle voice, and into high voice.

5. The teacher teaches student to sing repertoire by singing the alphabets (O) along with song's melodies then change into (R) by projecting into the same placement as (O), and the participants will sing correctly with word, musical components, and interpret of the song with understanding.

Participant 1 will sing "Steal away" and

Participant 2 will sing "Pie Jesu"

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant's learning cognition by reviewing the weak and strong points.

Material:

- Gym mat, towel and a bottle of water
- Piano sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes classical vocal skills from participants in studio.

- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

Session 14

Intervention session: PRBC

Learning objective:

1. The student can breathe deeply with the methods of Pilates respiration technique, and PRBC exercises with their singing in8 of 10 trails.

2. Student can sing with integration exercises that included the Pilates respiration methods with consistency air flow in 8 of 10 trials.

3. Student can sing the vocal onset through the acquisition of agility exercises with clear head tonal quality in8 of 10 trials.

4. Student can sing precisely the major scale with head tonal quality for low voice to middle voice and high voice.

5. Student can sing correctly with word, musical components, understand the meaning, and interpret of the song.

Procedure:

Introduction

1. The teacher introduces the lesson contents to the participant.

2. The teacher explains and reviews the importance of the Pilates-respiratory method and singing techniques within songs that consist of articulation and interpretation.

Learning activities

1.The teacher teaches student the PRBC method by including lateral breathing, diaphragmatic breathing neutral supine, and pelvic floor muscle engagement.

2. The teacher teaches student to sing the integration exercises by including the PRBC methods into the practice, by standing and trying to releasing the breathing into exercises of (Sssss and Brrrr).

3. The teacher teaches vocal onset of the acquisition of agility to student at exercise 3.5 (sequence 3), by modulating into diversity keys change.

4. The teacher teaches student with vocal warm-ups and exercises and student learns to sing arpeggio scale modulate into diverse key shifts through lateral vowels (O, R & A) into rounded vowels and adjusting into different vowels from low voice, middle voice, and into high voice.

5. Singing the alphabets (A) along with song's melodies, and the participants will start to learn the words of these songs and will sing correctly with word, musical components, understand the meaning, and interpret of the song;

Participant 1 will sing "Steal away" and

Participant 2 will sing "Pie Jesu"

Closing section:

1. The teacher concludes the lesson contents and assigns the home work.

2. The teacher evaluates the participant's learning cognition by reviewed the weak and strong points.

Material:

- Gym mat, towel and a bottle of water
- Piano sheet music, voice exercises and songs sheets.

Assessment:

- The teacher observes classical vocal skills from participants in studio.
- The teacher observes classical vocal skill from participants from video and scores them through the Classical Voice Rubrics Assessment.

BIOGRAPHY

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