

Work-based Learning Project (Intermediate)

BMPF7008

Module - 3

Voice Study Centre

University of Wales Trinity Saint David

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Table of content

FIRST PART - PROJECT PROPOSAL	1
I. Context	1
II. Justification	1
III. Intended Impact	2
IV. Outlined Intention	2
V. Ethics and Insider Research	4
VI. Expected Learning Outcomes	4
SECOND PART - PROJECT REPORT	5
I. Introduction	5
Personal Learning Outcomes	6
II. Literature Review	6
III. Methodology	8
IV. Findings/Discussions	12
a. Familiarity	12
b. Perception of each exercise	14
c. Participants' SOVT preferences	18
d. Participants' independent home exercise preference	19
e. Impression before and after all five exercises	21
V. Conclusion and Recommendations	22
Study Limitations	23
VI. Appendices	25
Appendix A - Parental Consent Form	25
Appendix B - Interview Guide	26
Appendix C - Participants' Familiarity to SOVT	30
Appendix D - Participants' independent SOVT exercise preference	31
Appendix E - Participants' impressions comparing before and after five SOVT exercises	32
VII. References	33

Work-based Learning Project (Intermediate) - BMPF7008

FIRST PART - PROJECT PROPOSAL

Title: **Study on the perspective of singing students aged 10-12 years to Semi-Occluded Vocal Tract (SOVT) exercises**

I. Context

This qualitative research project investigates students of a music centre in South Jakarta, Indonesia, where the researcher works as one of its studio singing teachers. Being a full-time one-on-one singing teacher at this music centre for the past six years made the researcher yearn for personal teaching improvement by re-examining his teaching practice and choices of vocal warm-ups and exercises to seek optimum learning effectiveness and outcomes. Semi-Occluded Vocal Tract (SOVT) exercises such as lip and tongue trills have been some of the primary vocal-building exercises he taught. Initially, they were chosen as passed traditions from his teachers to his students. As he began to expose himself to research papers about SOVT, such as the works of Ingo Titze and others, his critical thinking began to evolve, stimulating further learning of this topic.

This research will explore students' perceptions and experiences with some SOVT exercises. Based on the researcher's general observation and discussions among fellow teachers, some types of SOVT exercises have been popular among students and teachers of this music centre. However, they may still be limited to humming, tongue trills, lip trills and y-buzz. The use of other SOVTs, such as straw phonation and blowfish, is suspected not yet familiar to students and teachers of this music centre. This study will confirm students' familiarity with the exercises and explore their interests and future expected behaviour towards these SOVT exercises.

II. Justification

The main reason for the researcher to conduct this research is to improve learning outcomes and effectiveness. Previous studies show that it is crucial to understand students' perceptions of their teachers' activities in order to enhance learning outcomes (Iberico, C., Valle, J., & Pease, M., 2016). Understanding students' perceptions would also improve the teacher-student relationship and learning effectiveness (Poulou, M., 2009). In this regard, understanding the students' perceptions of SOVT exercises would contribute to the improvement of learning effectiveness and outcomes of including these exercises in

teaching sessions. The researcher chose SOVT as the learning activity being studied because these exercises have lots of favourable results in advancing singing qualities (Titze *et al.*, 2021; Titze, I., Nix, J., & Simpson, C., 2007; Natale *et al.*, 2022). However, most of the research involving SOVT and its efficacy is carried out with adult subjects, and only one study is with children (Patel, Lulich and Verdi, 2019), which is on the dysphonic ones (Ramos and Gama, 2017). This opens the opportunity for more potential study of SOVT on vocally healthy young singers.

III. Intended Impact

As mentioned above, the variety of SOVT exercises applied in the music centre where the research will be conducted is still limited. This research activity is expected to introduce the use of other types of SOVT exercises, stimulating more exposure, discussions, and further studies of these exercises. Some SOVT exercises, such as singing through a straw on water, are something that is suspected to be enjoyable for children and can potentially be one of the home exercise options that are easy and possibly exciting for young students to do at home, outside the lesson hours (Molloy, 2018).

In addition, previous studies regarding the SOVT topic rarely involved its applications on children (Patel, Lulich and Verdi, 2019). The researcher hopes this research will stimulate further studies regarding the application of SOVT exercises for young singers, their effect, and their contribution to raising children's singing skills in producing singing voices at higher artistic standards.

IV. Outlined Intention

To conduct this study, the researcher will use a phenomenological approach, investigating the lived experience of participants in SOVT practice through observations, interviews and analysis. Simple qualitative research is being chosen to accommodate the project's time scope (about three months) and the research report's word count limitation (7000 words).

The project starts with planning the research, during which research questions and designs are formulated, and ethical procedures are checked, anticipated and processed. Then, the researcher will find research subjects that consist of six participants, aged 10-12, who are studying in the music centre where the research is undertaken. Approval from the music centre management body will be obtained prior to commencing the research. Consent and authorisation for each student to participate in this research will be obtained from their

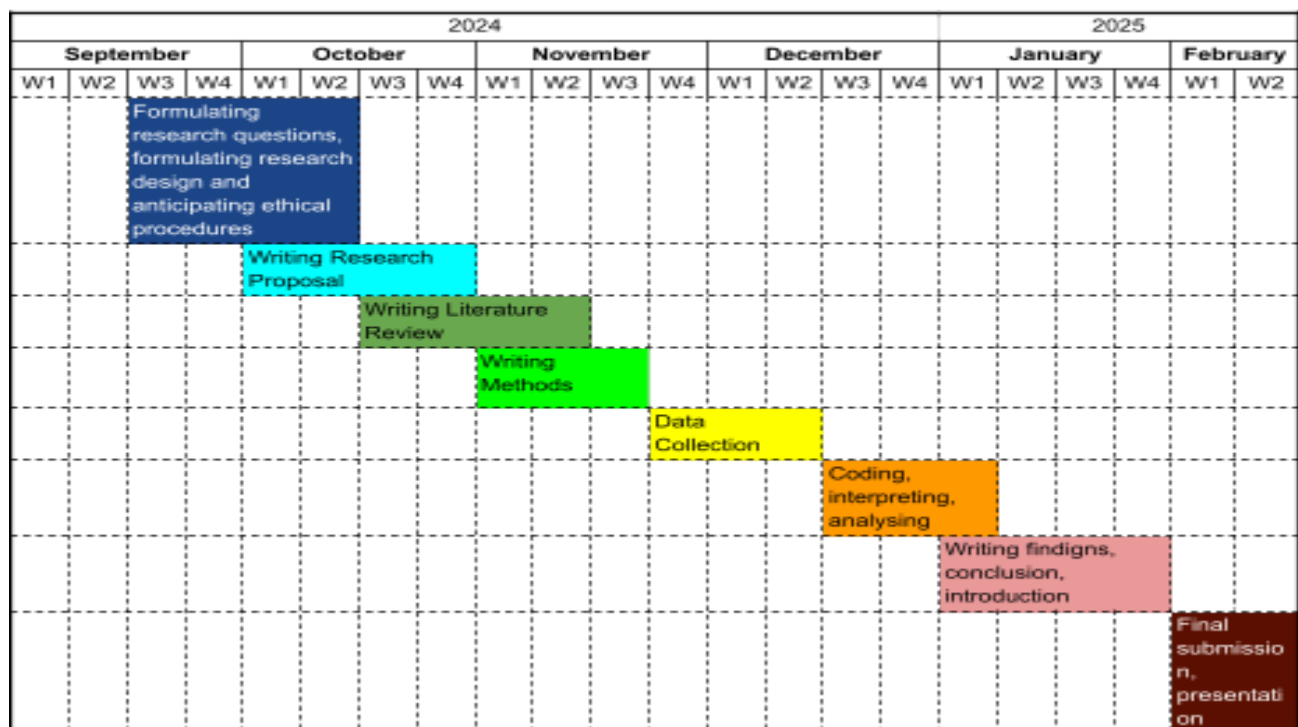
parents and the participants themselves. A background criminal record check of the researcher will be provided upon request.

On the day of data collection, the researcher will gather preliminary information about the participants and any of their previous knowledge and experiences with SOVT through questionnaires. The researcher will then explain the research activity and guide them in performing several SOVT exercises, observing the process, and taking notes. A semi-structured interview will be conducted after the SOVT exercises. Questions will cover their experience, preferences and interest towards these exercises. Some of these questions may include such as: “how do you feel as you do this exercise?”; “What do you think about this exercise?”; Is there any difference that you feel in your singing between before the exercise and after the exercise? In what way?”

Recordings of the interview process will be transcribed. They will be sorted into meaningful units (bracketing/coding) and categorised into themes. The essence or core theme will be identified, interpreted and then reported in writing (Sutton and Austin, 2015; Hycner, 1985; Chan, Fung and Chien, 2013).

The project timeline is shown in the chart below:

Chart 1. Project Timeline



V. Ethics and Insider Research

As an insider researcher, the risk of being exposed to bias is high. In order to mitigate this risk, the researcher will maintain his objectivity in practising this research project by critically evaluating his research methods and consulting with the tutor to get external perspectives. He will also make sure that there is no coercion involved and that the students are free to decide their participation in this research or to stop at any point during the research process whenever they feel the need to, without any consequences in regard to their student status to the music centre.

As this research involves underage participants, the researcher will make sure that consent is given prior to participation by parents or legal guardians in order to maintain excellent ethical conduct in this research. The researcher will also protect data privacy and confidentiality by not exposing sensitive data such as names and other personal information and keeping all research data secure. He will also maintain transparency making sure that participants understand the research and that they can freely opt to stop participating at any time during the research.

VI. Expected Learning Outcomes

The researcher's main expectation from his research activities includes:

1. To seek improvement of his overall teaching practice. He starts focusing on the vocal exercises he uses with his young students. He hopes that shortly, he can be more informed and able to expand the variation of vocal exercises that he confirmed would work well for his young students.
2. To get valuable feedback from students for further improvement and development in practising SOVT.
3. To have this research become a starting point for a deeper understanding of SOVT exercises and their significance to the teaching of young singers.
4. To find further ideas for more studies about SOVT

(word count: 1,197 words)

SECOND PART - PROJECT REPORT

Research Title: Study on the perspective of singing students aged 10 to 12 to Semi-Occluded Vocal Tract (SOVT) exercises

I. Introduction

This research aims to explore and better understand the experience and perspective of young singing students in Semi-Occluded Vocal Tract (SOVT) exercises. The research was conducted on students of a South Jakarta, Indonesia, music school. This music centre is well-known for its strong vocal music culture. It is the home of children's and adult choirs that have both regularly won European international choral competitions for the past ten years and both are the past winners of the prestigious European Grand Prix for Choral Singing (EGP).

The primary goal of this research is to enhance learning outcomes and effectiveness when working with young singing students. Previous research has shown that understanding students' perceptions of their teachers' actions is important to strengthen teacher-student relationships, learning outcomes and effectiveness (Iberico, Valle & Pease, 2016; Poulou, 2009). Especially in children, understanding their perspective could help determine what motivates them to learn and the reason behind it (Smith, Duncan and Marshall, 2005). Taking this into the context of singing pedagogy, the researcher would like to investigate the perspective of young singing students on SOVT exercises in order to meet the aim of exploring more vocal exercises and strategies that can be applied to young singing students at private lessons. By learning from the feedback of the students, the researcher hopes to investigate whether certain exercises are efficient or effective for them.

The researcher chose to study SOVT due to its proven success in enhancing singing efficiencies (Natale et al., 2022; Titze et al., 2021; Guzman, 2017; Titze, Nix & Simpson, 2007). However, the researcher suspected that some variations of SOVTs may still be unknown or not yet being used by voice teachers in Indonesia. However, there was no research found yet to confirm this to the researcher's best knowledge. In addition, most previous SOVT research has been conducted with adults as participants. Only a few SOVT studies used children as the target population, such as being done by Patel, Lulich and Verdi (2019), Lulich and Patel (2021) and Ramos and Gama (2017). This presents an opportunity for further research on applying SOVT exercises in children. Through this study, the

researcher would like to answer the following question: “What is the perspective of private singing students aged 10 to 12 on SOVT exercises?”. Understanding the students' perceptions of these exercises may contribute to improving their learning effectiveness and outcomes. This study is being done in one music centre in Jakarta with the hope that this could be a start for more future studies regarding this topic involving more music centres in Jakarta and other cities.

Personal Learning Outcomes

Conducting this study has allowed the researcher to develop and improve his research skills. Specifically, this study helped him gain a deeper understanding of research methodologies, such as better knowing the nature of himself as a researcher and the paradigm he naturally leans towards. This project also stimulated him to have better time management and organisation when conducting research, such as organising interview questions data. Most importantly, this project gives the opportunity to learn how to work with child participants in research, in which most of his clients fall in this age range.

As a singing teacher himself, the researcher gains valuable insights from his research participants, who are students of various teachers, by interacting directly with them; thereby, he obtained pedagogical knowledge beyond what he could obtain from common academic resources such as books and journals. As a lifelong learner, this study is an eye-opener to many things he should take more time to learn further, especially in the area of research, and also in child pedagogy, psychology, and vocal development.

II. Literature Review

Many voice teachers and clinicians have long used exercises under the umbrella term SOVT as these exercises promote mechanical interaction between the source and the filter, thus improving vocal efficiency and economy (Titze, 2006; Guzman et al, 2015; Meerschman, 2024). SOVT are exercises that involve occluding, lengthening, or both lengthening and occluding the vocal tract while phonating (Apfelbach and Guzmán, 2024; Andrade et al, 2014; Story., Laukkanen, Titze, 2000). This exercise creates back pressures that increase supraglottic pressures toward the vocal cord, which balances the pressure from below the vocal fold, thus creating more balanced vocal fold vibrations and economic phonatory such as reduced phonatory effort and vocal fold impact stress and significantly improve singer's voice quality (Apfelbach and Guzmán, 2024; Meerschman, 2024; Guzman, 2017; Natale et

al., 2022; Shean and Yie, 2022; Titze et al., 2021; Titze, Nix & Simpson, 2007). Although most previous studies on SOVTs mentioned only involved adult participants, a study by Patel, Lulich and Verdi (2019) about the adjustment of acoustics and vocal tract shapes in 21 children during flow-resistant tube found that results in children aligned with the results of studies on adult participants. This confirms that SOVT exercises could similarly benefit children as they benefit adults.

The SOVT exercises involved in this study chosen by the researcher include (1) lip trills or lip buzz, (2) tongue trills or rolled /r/, (3) blowfish, (4) straw phonations, and (5) straw phonation in water, or often known as “water resistance therapy”. Lip and tongue trills as well as straw phonations, are common SOVT exercises mentioned in many previous studies. Such as by Manternach, Maxfield and Manternach (2021), who studied a variety of SOVT exercises on music theatre singers, including lip trill and straw phonation. They found that lip trill has the most consistent positive effect, which is reduced perceived vocal effort in the comparison of its pre and post exercise. Meanwhile, Apfelbach and Guzmán, (2024) compiled research on SOVT that happened within the past 20 years and found that both lip trill and tongue trill contribute to reducing phonatory effort and improving vocal fold efficiency and resonance. Based on their study, water-resisted phonation provides the highest airflow resistance and maximizes phonatory effort reduction.

Figure 1. Blowfish exercise



The blowfish exercise was popularised by Rosenberg (2021) in the book titled *The Vocal Athlete: Application and Technique for the Hybrid Singer*. This exercise is performed by vocalizing through pursed lips with fully puffed cheeks. This exercise has not yet been mentioned much in formal academic journals. However, according to Manternach (2024),

blowfish exercise has the primary benefit of vocal tract “reset” as it creates pharyngeal stretch, which increases the sense of space and release in the pharynx. Understanding that this exercise is rarely discussed, the researcher decided to include the exercise in this study.

There were some previous studies that investigated singers’ perceptions of the effect of the SOVT exercise, such as those by Manternach, Maxfield, and Manternach (2021), who studied the perceptions of music theatre singers to SOVT. Most participants in their study felt less vocal effort post-SOVT exercises. However, their preferred exercises varied individually. Another study on singers’ perceptions by Martinho and Constantini (2020) found that singers mostly perceived that their vocal qualities improved after performing SOVT exercises. He also mentioned that different singers may benefit from different Semi-Occluded Vocal Tract (SOVT) exercises. For example, singers with high voices may find that using a high-resistance straw for SOVT exercises is most beneficial. In contrast, singers with low voices may benefit more from using a latex tube for SOVT exercises. In this regard, the use of SOVT exercises may need to be tailored based on students’ conditions and needs.

In the context of pedagogy, understanding young learners’ perceptions and responses to singing exercises given by their teachers is important as they can offer valuable insights into promoting a more effective and engaging learning experience (Smith, Duncan and Marshall, 2005). In this regard, capturing young singers’ feedback on SOVT exercises should be able to help teachers refine their teaching strategies and designs to match the student’s learning styles. This approach is aligned with a study by Jang, Reeve and Deci, (2010) that finds students engage most when teachers provide both autonomy support (such as allowing choice and valuing student input) and structure (clear expectations and guidance) where there is a good balance between teachers’ clear expectations with a student-driven learning experience.

III. Methodology

As stated in the research proposal, the initial intention of this study was to employ only qualitative methods of thematic analysis to capture participants’ experiences following SOVT exercises. However, the researcher learnt that eliciting in-depth responses from these young participants was challenging. This is possibly due to their age, and cognitive as well as language skills, which are yet to be fully developed (Shi, Z., 2013). Although almost all of these young participants speak English regularly at their schools and some even also at home, English is not their mother tongue. In addition, the researcher also saw a valuable

opportunity to enhance this study by collecting data that leans towards frequencies and counts. This includes familiarity with SOVT, the ranking of preference regarding SOVTE being studied, and home exercise preference. This research thus balances the constructivist influence and the positivist influence, which leads to pragmatism. Consequently, a mixed method was pursued, where both qualitative and quantitative approaches were used, and data were concurrently collected during the same stage (Almeida, 2018; Creswell, 2012). In the interview session with each participant, there were both open-ended interview questions as well as closed-ended interview questions.

This research focuses on healthy children between the ages of 10 and 12 who sing regularly, at least once a week, in a private lesson setting or choir rehearsals. The age group of 10 to 12 was chosen because this age group is quite commonly found at private music centres. There were previous studies about children and their study in private music centres that often included this age group as their participants. Some of the examples are studies by Rife *et al.* (2001), who study children aged 9-12, and Ranelli, Straker and Smith (2011) who study children of 7-17 years old. In addition, the children in the age group of 10 to 12, are mostly in the upper-elementary school age, which means that they have the characteristics of children yet possess more developed cognitive capabilities (Reifman, 2009). Despite the range of ages and backgrounds of the students available at the music centre where the research took place, due to time limitations, this study only focused on this one age group. The researcher decided on a closer age gap to minimise response differences that could occur due to age-related variations in cognitive and vocal development. (Pribuisiene, Uloza, and Kardisiene, 2011).

To find research participants, the researcher distributed invitations to participate in this research to students and teachers of this music centre through an internal WhatsApp group of teachers. He also sent these invitations directly to several parents of students aged 10-12 in the music centre, who contacts he has access to. Twenty-one children participated in this research. 17 girls and four boys. After getting consent from their parents (see Appendix A for a sample of the consent form), each of these children was individually scheduled for an individual session with the researcher.

At the beginning of each session, the participants were asked about their physical well-being when participating in this research. Such a question is essential to ensure that the study results are due to the exercise and not confounded by other health variables (Steel & Wendler, 2022). Then, the researcher guided them to perform some simple singing/vocalisation in /i:/ or with /ʊ/ with melody options as shown in Figure 2a, and raise

one semitone after each set, all the way up to G5 as the highest point. The range and choice of melody is adjustable according to the participants' situation (e.g. vocal range)

Figure 2a. Vocalization options before and after exercise



This activity is to investigate the perception of each participant about the whole SOVT activities that are being conducted in the session. The researcher expects them to compare the sensation of singing prior to SOVT exercises and after all five SOVT exercises and record their general feedback. In this regard, each participant was guided to do two sets of exact vocalisation exercises: once at the beginning of the session, before conducting any of these SOVT exercises, and another one at the end of the session after experiencing all five SOVT exercises. The melody option and the range selected for both times are exactly the same for one participant, although may be different for other participants. They were interviewed for their perceived sensations after all five exercises to learn if these children could feel any difference in their singing activity after experiencing a series of SOVT exercises. Previous studies on adult participants have shown that SOVT has immediate effects on voice production (Meerschman *et al.*, 2023; Bonette *et al.*, 2020; Brockmann-Bauser, Balandat, and Bohlender, 2020; Croake, Andreatta, and Stemple, 2017). This study would like to investigate if children could feel any sensation or perceptive changes in their singing after the SOVT exercises.

Figure 2b. Melody samples for the SOVT exercises



After the initial vocalization, the researcher began guiding each participant in performing the SOVT exercises and interviewing them about their experience after each SOVT exercise. The SOVT exercises included in this study are (1) lip trill, (2) tongue trill, (3) blowfish, (4) straw phonation, and (5) water resistance therapy. The researcher anticipated that the level of familiarity with SOVT exercises would vary among these young participants. In this regard, the researcher assists these young singers in how to perform each exercise. Some participants may only require simple guidance, while other participants may need more assistance and time pre-training from the researcher before they can do the exercise. This would depend on each participant's familiarity and capability when attempting to perform each exercise. The aim is for them to gain sufficient experience with all five SOVT exercises to articulate their perceptions of each exercise.

Each of the exercises used a simple melody. The variations of these melodies are shown in Figure 2b. It started from C4 as the lowest point and raised one semitone after each set all the way until hitting note G5 as the top point. The range is adjustable depending on the participants' situation (e.g. vocal range). Variations of melodies are provided to accommodate problems that may occur when these young participants perform these SOVT exercises. For participants facing technical issues, the melody could be simplified into two notes descending "sol-do" or even into a simple one semibreve note for each time.

After each exercise, a semi-structured interview was performed by the researcher with each participant about their experience after performing each exercise. Data being collected during the interview are: (1) Their familiarity and previous experiences with the SOVT

exercises involved in this research; (2) Their impressions, perceptive views and physiological experiences when performing each of the exercises; (3) Their ranking of these five exercises based on favouritism and the reason of their choices to most favourite and least favourite; (4) Their SOVT preference for independent home exercise along with their reason; and (5) Their perception of their voices or instrument sensation, comparing their singing between pre and post all five SOVT exercises.

The qualitative data, the participants' impressions of each exercise, was analysed using thematic analysis. This method allows the researcher to identify, analyse and interpret patterns and then report them as themes (Lochmiller, 2021; Fuchs, 2023; Clarke and Braun, 2017). Codes were generated based on participants' descriptive answers of their impressions after each exercise. Similar codes were then grouped into themes and analysed (Clarke and Braun, 2017; Peterson, 2017). Meanwhile, this study's quantitative data was analysed using some of the descriptive statistics principles, including mean, mode, rank and frequency distribution (Lee, 2020; Sharma, Kanchan and Krishan, 2018). The researcher used Google Workspace to organise the data, utilising Google Sheets, Google Docs, and Google Drive.

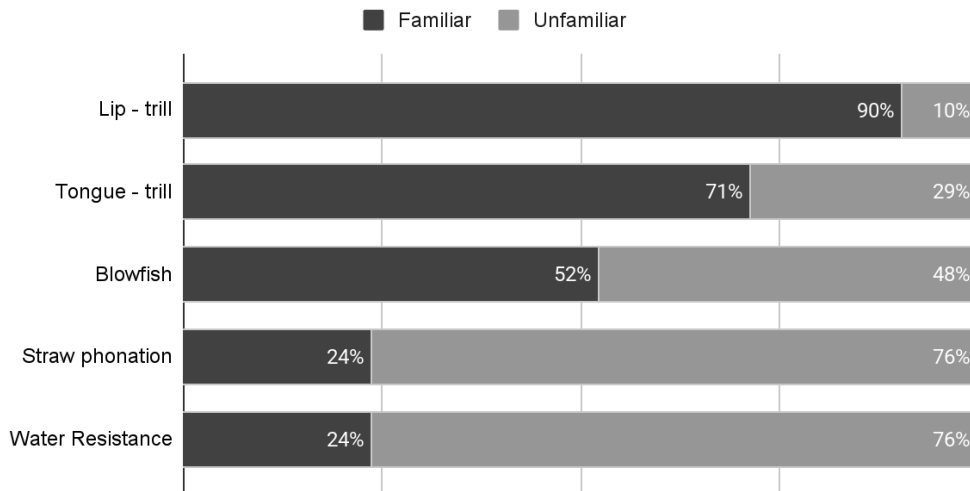
IV. Findings/Discussions

Based on the interview with each participant, both qualitative and quantitative data were organised into the following sections: (1) familiarity with the SOVT exercise, (2) perception of each exercise, (3) participants' SOVT preferences, (4) participants interest for independent home exercise as well as their exercise preference, (5) sensation comparison between before and after the five SOVT exercises.

a. Familiarity

All of the participants in this study were unfamiliar with the term "Semi-occluded vocal tract" (SOVT). However, Figure 3a shows they had prior experience with several associated exercises. This suggests that while they may not have been formally introduced to the concept or terminology, they had likely encountered and practised elements of SOVT training through some of these exercises. The most familiar SOVT exercises among these research participants were lip trills, followed by tongue trills and blowfish exercises. Exercises involving straws, the straw phonation in air and the one in water, were unfamiliar to most research participants.

Figure 3a. Familiarity to five selections of SOVT exercises



Although 90% of the participants are familiar with the term "lip trill" and do have prior experience with the exercise, not all of them encounter this exercise on a regular basis. As shown in Figure 3.b., there were only 38.1% of participants stated they regularly practised the exercise during private lessons or choir rehearsals. This contrasts with the 52.4% who are rarely encountered with this exercise. This data indicates that although most students know this exercise, it is not yet a popular tool among teachers of the students participating in this study. Further investigation into the teachers' perspectives may be necessary to understand the reasoning behind this. A further study with a bigger population would indicate better to determine if this exercise is indeed unpopular to be taught to children in this city or country.

The observational notes from the researcher showed that some participants had difficulty performing the lip trill exercise, which is consistent with the rare practical use of this method. Among those who rarely do lip trill, was Participant #1, age 12 years old, who knew lip trill exercise but still found it extremely challenging. The researcher spent time assisting him to do it, and he eventually achieved some success using the help of two fingers at the side of his lips, though he still had many unsuccessful attempts. Observing the participant's frustrated facial expression, the researcher stopped the lip trill exercise after several successful and many unsuccessful attempts, and continued interviewing him before moving on to the next exercise. A similar situation also happened to Participant #12, a 12-year-old who also recognised this exercise. Participant #3, an 11-year-old, who also knew the exercise, also had difficulty. However, after teaching her how to do lip trill, instead of stopping

the exercise, the researcher decided to simplify the melody into one sustained note for each key, and things went well. Participant #5, also found difficulty. To assist her, the researcher also tried alternative melodies and used a simple descending melody, which worked well for her. Not all of the participants who rarely do lip trill find difficulties, some of the others could do this exercise fluently when asked, such as Participants #4, #6 and #7.

The findings reveal a gap between lip trill awareness and regular practice among participants aged 10 to 12. While most are familiar with lip trills, many do not use them regularly, which may contribute to the difficulties observed in those trying to perform them. However, some participants demonstrated proficiency, suggesting that lip trills can be effectively incorporated into their routines with proper guidance.

b. Perception of each exercise

Participants' comments and feedback after performing each SOVT exercise were recorded. These comments and feedback were then transformed into codes. The codes were organized and grouped together based on similarity and then themes were generated from them. These themes are: (1) Physical sensations (2) Effort required (3) Emotional responses. The codes and themes are shown in Figure 4 below, also indicating how often each code appeared in participants' comments.

Participants' descriptions of physical sensations varied significantly across exercises. The most physical sensation mentioned by participants is the tickle sensation, which was mentioned 29 times across all five SOVT exercises, with the most ticklish sensation at the lip trill exercise, which was mentioned 15 times. The next physical sensation mostly mentioned was the vibrating sensation, which was mentioned a total of 23 times, and spread almost equally among lip trill, tongue trill, straw phonation and water resistance exercise, which were five to six times mentioned. These sensations could indicate a relationship to what we know about SOVT exercises, where they create back pressure that interacts with the vocal folds, improving balance and voice economy (Titze, 2006; Meerschman *et al.*, 2023).

Ironically, the third most frequently mentioned physical sensation by research participants is the 'no sensation' which was mentioned 23 times, as many as the total for the vibrating sensation. This response was mostly attached to the blowfish exercise. This is aligned with the finding that blowfish exercise received the least total response of physical sensation. This may raise questions about its effectiveness for this age group as well as their ability to perceive its effect. This also might open an opportunity for future studies to know if the

Figure 4. Codes from participants' responses being grouped into themes

Type of feedback	PERCEIVED PHYSICAL SENSATION					
	Lip trill		Tongue trill		Blowfish	
Positive & Neutral	Ticklish	15 times	Vibrating sensation	6 times	Ticklish	3 times
	Vibrating sensation	5 times	Ticklish	5 times	Vibrating sensation	2 times
	lips feels lighter	2 times	shaky	1 times	airy	1 times
	buzzing	1 times			lots of air in the mouth	1 times
Negative					head posture tilting up	1 times
			no special sensations	3 times	no special sensation	10 times
			normal	2 times	no special sensation	4 times
			uncomfortable	2 times	keep loosing air	1 times
Neutral			slightly pain	1 times	slightly pain	2 times
					pitchy	1 times
					uncomfortable	1 times
					voice crack	1 times
Type of feedback	PERCEIVED EFFORT REQUIRED					
	Lip trill		Tongue trill		Blowfish	
Positive	easy	3 times	moderate easiness	4 times	easy	2 times
	moderate easiness	1 times	easier than lip trill	2 times	easier than lip trill	2 times
			easy	2 times	easier than tongue trill	2 times
					moderate easiness	2 times
Negative	difficult	11 times	difficult	7 times	harder than lip trill	3 times
	tiredness	1 times	harder than lip trill	7 times	harder than tongue trill	2 times
	pitch going sharp	1 times	hard to maintain the trills	1 times	extra effort	2 times
			limited to those who can rolled their ms	1 times	challenging in the upper range	1 times
Neutral			not used to it	1 times	hard to breathe	1 times
					tiredness	1 times
					more push	1 times
Type of feedback	EMOTIONAL RESPONSES					
	Lip trill		Tongue trill		Blowfish	
Positive	fun	3 times	interesting	1 times	funny	2 times
	interesting	1 times	enjoyable	1 times		
					interesting	3 times
					Calm	1 times
Negative					funny	1 times
	loosing focus	2 times	loosing focus	2 times		
	confusing	1 times	confusing	1 times		
	frustration	1 times	useless	1 times		
Neutral	useless	1 times				
					I don't like this	2 times
					useless	1 times
					confusing	1 times

physiological situation of young participants whose vocal instruments are still under development significantly contributes to this “no sensation” response of the blowfish exercise.

Among the responses these participants gave, only a few were negative feedback, which included uncomfortable and slight pain. In this regard, in terms of physical sensation, apart from causing ticklish, these SOVT exercises are still tolerated by children in this age group.

The second theme, the perceived effort required, focuses on how challenging participants found these exercises. Most of the feedback is related to the difficulties in performing the exercise. Though familiar, the lip trill is mentioned by participants as difficult. This difficulty could be related to the less frequent use of this exercise, as previously mentioned in this study report. Apart from the lip trill, the exercises that also have many codes on difficult and challenging altogether were tongue trill and straw phonation. Some participants consider tongue trill to be harder than lip trill. Participant #9 specifies that tongue trill is “difficult, especially for children who don’t roll their Rs”. Although in the Indonesian language ‘Bahasa Indonesia’ Rs are always being rolled, based on the researcher’s observation, many of these participants experienced uneasiness when rolling their Rs, especially on a longer phrase.

There are several factors that could influence this phenomenon. Apart from the potential physiological development factor, one of the other reason could be the influence of the increasing bilingualism in Indonesia, where the use of English as the primary language in schools has shown rising trends over the years (Jayanti and Sujarwo, 2019; Abduh and Rosmaladewi, 2019). There are more Indonesian children who speak English, a language that mostly does not roll Rs, more often than speak in Bahasa Indonesia. This could contribute to the difficulties of some participants when performing tongue trill exercises. On the other hand, some of the other participants, such as Participant #1 and Participant #12, who were struggling with the lip trill exercises, rolled their Rs effortlessly and found that it was easier to do the tongue trill exercises rather than the lip trill exercise. From this, we can understand that applying SOVT exercises in lessons needs to be tailored to the condition of each student.

Another exercise that received a lot of feedback regarding difficulties was the straw phonation (without water). Some of the difficulties specified by participants are related to focus and breath management. Participant #17 mentioned, “I don’t like this, (it is) hard to sing while blowing ... it feels like losing air easily, and I keep gasping for air”. Participant #8 mentioned, “It is hard to keep the focus on blowing and singing at the same time. If I focus on the blow, the sound feels small, but if I focus on the singing, the blow doesn’t happen.” Participant #7 mentioned, “it is harder to blow, harder to make the sound”

Participants' unfamiliarity with this straw phonation exercise--as previously mentioned, found in this study--may also contribute to the perceived difficulties that occurred. Participant #11 mentioned, "First time, it is a bit difficult to hit the notes perfectly, but after some time getting used to it, it becomes easier". A similar response was also mentioned by Participant #5: "At first, it feels a bit hard, but once used to it, actually, it is pretty easy". From this response, we can understand that with practice, unfamiliar exercises became easier to perform. In this regard, teachers can gradually introduce SOVT and adjust them based on the student's comfort and progress. It is also good to note that since different participants found different exercises easier or harder, SOVT exercises should not be applied in the same way to every student. Exercises should be tailored based on the student's needs and conditions.

In contrast to the straw phonation exercise, the 'other' straw exercise, the water resistance therapy, received little negative feedback. Although it was at the same unfamiliar level as the straw phonation exercise, it received much positive feedback, especially related to the third theme: emotional responses. There were a total of 22 positive responses to this exercise. Among others, these include "fun", "interesting", "feels like playing", "it gives childhood memories" and "enjoyable". Participant #13 mentioned, "Very satisfying! Very ASMR, and it's so fun!" Participant #15 mentioned, "It is satisfying to do, and it is so fun. It is really comfortable to do and to see water". Participant #11 mentioned, "It is a little bit harder to hit the notes, but it reminds me of swimming. It is fun, it gives childhood memories. It doesn't give any ticklish.

With the intention of balancing teacher's expectations and student-driven learning as mentioned by Jang, Reeve and Deci (2010), teachers can use students' feedback, such as feedback on the water resistance therapy above, when developing their teaching strategies. For example, when introducing SOVT to students who are unfamiliar with the exercises, teachers can choose which SOVT to start with that could raise students' interest while at the same time building their familiarity and understanding of the concept and principles, before proceeding to introduce more challenging exercises.

Based on this thematic analysis, we can understand that despite some "no sensation" responses, in general, students as young as this age group are able to acknowledge and articulate what they feel in their instrument during certain exercises. This brings the understanding that promoting self-reflection in lessons could be beneficial both to the teacher and the students. Information such as that presented above could help teachers to prioritise and which exercise to be given first to the students based on the student's situation and response. Meanwhile, for student, self-reflection would stimulate their awareness of

what happening in their body, which would support their singing technique training. With the understanding that some of the students might have difficulties in performing these SOVT exercises, teachers need to equip themselves with ‘tips and tricks’ to help those who may find these exercises challenging.

c. Participants’ SOVT preferences

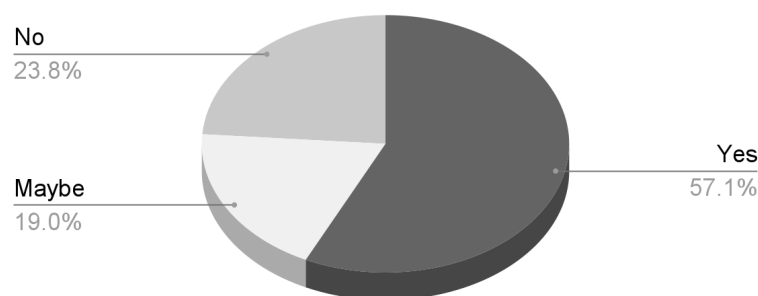
Each participant ranked these five exercises based on their most or least favourite. The result is presented in Figure 5. The most favourites are marked with number one, second with two, and so on, until the least favourite with number 5. Based on the mean rank analysis, water resistance therapy is the most favourite and tongue trill is the least favourite among the five exercises being studied. These findings aligned with the feedback received previously mentioned. As the least favourite among the five SOVTs based on mean rank,

Figure 5. Rank analysis of the five SOVT exercises based on participants’ preference

Participant	Lip trill	Tongue trill	Blowfish	Straw phonation	Water Resistance
Participant #1	5	2	4	3	1
Participant #2	2	5	4	1	3
Participant #3	5	4	2	3	1
Participant #4	5	3	4	2	1
Participant #5	5	1	4	3	2
Participant #6	4	5	3	2	1
Participant #7	3	4	1	5	2
Participant #8	2	5	4	3	1
Participant #9	1	5	4	2	3
Participant #10	1	5	3	4	2
Participant #11	3	1	5	2	4
Participant #12	5	1	4	3	2
Participant #13	2	5	4	3	1
Participant #14	2	1	3	4	5
Participant #15	2	4	5	3	1
Participant #16	1	5	3	4	2
Participant #17	1	3	4	5	2
Participant #18	2	4	5	3	1
Participant #19	1	3	2	5	4
Participant #20	2	3	1	4	5
Participant #21	4	5	2	3	1
Mean Rank	2.76	3.52	3.38	3.19	2.14
Rank of Mean Rank	Second	Last	Fourth	Third	First
Mode	2	5	4	3	1

tongue trill received plenty of negative code in the sensation feedback. The exact alignment also happens with the most favourite one, the water resistance exercise, which receives the most positive tone in the participants' sensations feedback. In this regard, this study finds that there is an indication of a relationship between students' favouritism of an exercise and the perceived sensation it brings to the students. The quantitative findings of the most and the least favourite SOVT exercise in this study are most likely a result of the sensations each exercise brings to the participants.

Figure 6a. Possibility for independent practice outside lesson hour



d. Participants' independent home exercise preference

Each participant was asked for their preference for home independent practice, whether they will actually do the independent practice at home when being asked by their teacher, and if they do, which SOVT they would most likely choose if they had the freedom to choose any one of them. Their answers are presented in Figure 6a. More than half of them answered that they would do the exercise independently at home when asked by their teacher, while 23.8% of them answered 'no'. Their reasons include:

"These exercises are not something appealing" (participant #6, 10 yrs old)

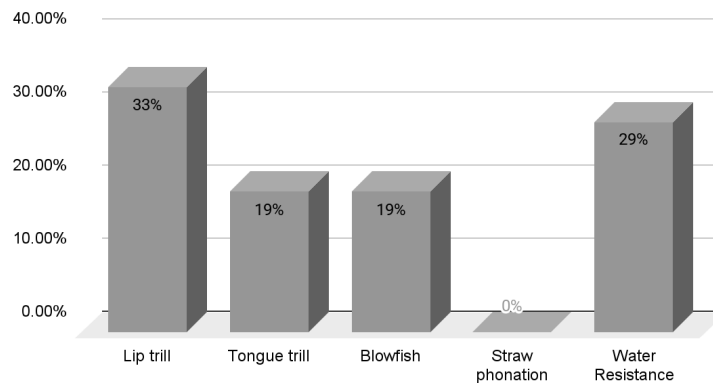
"I mostly don't have the motivation to do it at home; depends on the exercise. I'm kind of lazy to do it" (participant #9, 12 yrs old)

"I have too many activities, so probably no" (participant #11, 10 yrs old)

"No, I don't like it" (participant #20, 12 yrs old)

These participants were also asked about their exercise preferences when they really must do one of these exercises at home. Their answer is presented in Figure 6b. Most of the participants answered Lip Trill as their primary choice. The second highest choice for

Figure 6b. Preference for independent home exercise



independent home exercise is the water resistance exercise, which is the most favourite exercise based on this study. Some of the participants who chose the lip trill exercise mentioned the following reasons:

“... this exercise is more familiar. I would not do the other exercises” (Participant #9, 12 years old)

“...because you don’t need anything to prepare” (participant #17, 12 years old)

“...because it is simpler to do and doesn’t require a lot of steps to do, so you don’t need to prepare materials, but you can just simply do it whenever you want to” (participant #15, 11 years old)

“... because tongue-trill is too easy, so I would go to the next challenging one” (participant #14, 10 years old)

Some of the participants who chose the water resistance exercise mentioned the following reasons:

“It’s fun, it’s my favourite one, because of the bubbles” (participant #4, 11 years old)

“Because it’s like playing” (participant #6, 10 years old)

“Because it was a lot of fun!” (participant #13, 12 years old)

“... it kept bubbling, and it was fun” (participant #18, 11 years old)

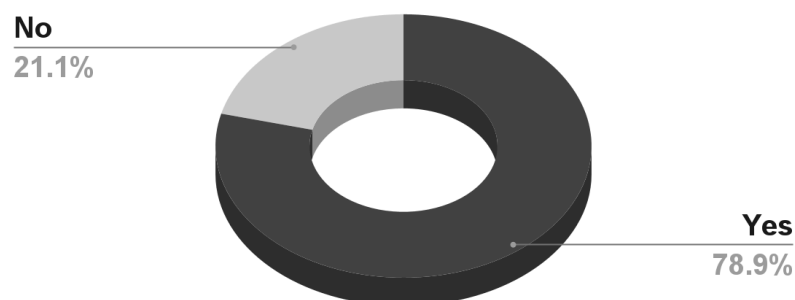
“Because it was fun and actually very easy” (participant #21, 11 years old)

The positive feedback from lip trill and water resistance exercises in this study is aligned with previous studies of these SOVT exercises to adult participants who also experienced more comfort and better self-perceived vocal qualities (Meerschman *et al.*, 2019; Manternach, Maxfield and Manternach, 2021; Simberg and Laine, 2007).

Although water resistance received the highest rank as the favourite among these five SOVT exercises, this exercise sits below lip trill which ranked first in the category. Even though lip

trill received few negative codes on perceived efforts and emotional response, It is still becoming the first choice for independent home exercise, due to its practicality and familiarity. This shows the importance of the factors of familiarity, practicality and anticipating emotional response when choosing exercises for young learners. Teachers can start with exercises that are fun or familiar to keep students interested and motivated while gradually building their familiarity with other exercises.

Figure 7a. "Can you feel any difference between the singing before and after SOVT session?"

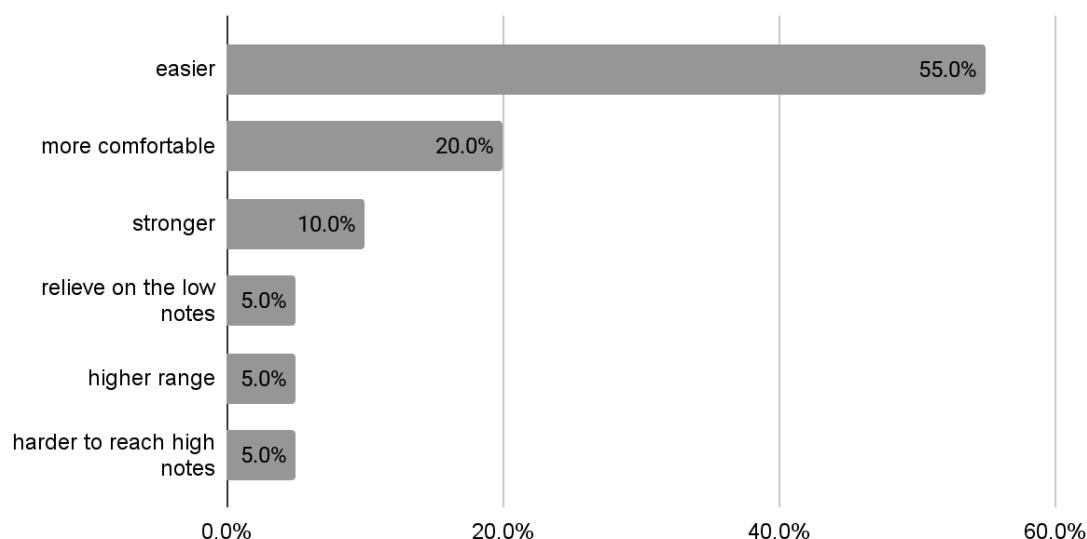


e. Impression before and after all five exercises

Each participant was also questioned about their perceptive sensation and whether they felt any differences between the vocalization before the five exercises and after these five exercises. This part of the research is based on the answers of 19 participants. Two participants did not participate in the post-five SOVT session check, due to timing incidents where they suddenly needed to leave. As illustrated in Figure 7a, there were 78.9 % of the participants who answered that they can feel the difference. Of these participants, half of them claimed that they felt easier to sing after these five exercises. Some other comments also include "more comfortable" to sing and that their voice feels "stronger". This finding is presented in Figure 7b These findings aligned with the previous research on SOVT which suggested that SOVT promotes a more unrestricted, more efficient, more resonant voice with less fatigue and more comfort (Meerschman *et al.*, 2023; Croake, Andreatta and Stemple, 2017; Simberg and Laine, 2007). The participants reported improvements in ease and comfort also shows that SOVT exercises can give noticeable and immediate benefits to young singers. This positive effect could motivate them in their lesson and promote active engagement during their vocal lessons. In this regard, teachers should consider including SOVT exercises in their practice for young learners. In addition, due to its immediate effect,

it is worth adding more variety of SOVT exercises, especially those that are still less popular but proven to be effective, to increase the student's familiarity with many SOVT exercises. Listening to their response and tailoring the exercises to the situation would also be beneficial to increase engagement and maintain learning motivation.

Figure 7b. Perceived sensations of the difference in participants' singing after the SOVT session.



V. Conclusion and Recommendations

This research investigates the perspective of young singers 10-12 years old on SOVT exercise with the aim of exploring potentially effective vocal exercises for young learners to enhance their learning outcomes. This study captured the subjective experience as well as measurable trends on the five SOVT exercises through a mixed-methods approach. The study shall contribute to the understanding of how young singers experience and respond to SOVT exercises. The motivation to explore students' perceptions aligns with previous studies that emphasise the importance of student perception and engagement in the learning process (Smith, Duncan & Marshall, 2005; Jang, Reeve & Deci, 2010).

The research question "What are the perceptions of SOVT exercises for private singing students aged 10 to 12?" was thoroughly addressed. This study found that the perspectives of young singers are formed based on their physical sensations, the effort they feel each exercise requires and their emotional responses. This finding aligns with prior research on adult participants where singers' preferences for SOVT exercises varied based on individual experience and comfort (Martinho and Constantini, 2020). Tickles and vibrating sensations

were the most physical sensations that participants felt especially in lip trill. Although the participants sometimes were not able to feel any sensations when performing these five SOVT exercises, in general, this study demonstrated that young students at this age are able to recognise and articulate changes in how they feel in their voices after exercises. In this regard, self-reflection could be a beneficial teaching tool for them to help build their awareness of vocal techniques.

This study also found that, while all participants were unfamiliar with the term “SOVT”, many had previous experiences with the related exercises, particularly lip trills. However, knowing these exercises does not guarantee they can do them well and regularly. Their private teachers’ exercise preferences during their lessons (e.g. vowels or syllables vocalization, instead of SOVTs) may contribute to the rare experience of these five SOVT exercises. In addition, lip and tongue trills are still considered by many of these participants as quite difficult. However, despite its trickiness, lip trill was still chosen as the second most favoured among all the five SOVTs for an independent home exercise. Apart from its familiarity, it was chosen primarily because of its practicality, as it doesn’t require specific preparation, such as straws and water, to execute the exercise independently by the students at home. Water resistance therapy, despite being relatively unknown to these participants, came as the most favoured SOVT exercise of this age group due to being likeable and entertaining. This aligns with findings from Jang, Reeve and Deci (2010), which emphasize that student enjoyment and engagement play important roles in the learning process and skill development. This finding also shows how important familiarity and emotional responses factor when choosing exercises for young learners, as they can help to motivate the students.

Specific SOVT exercises that are perceived as “fun”, such as water resistance therapy, could become an alternative for teachers to use in their teaching to increase and maintain students’ interest. The use of SOVT exercises may also need to be tailored to the student’s situations (e.g. some can roll their Rs, some don’t, etc) and be taught to students at a customised pace based on their feedback and self-reflection response.

Study Limitations

There were some limitations in this study. First of all, the study only involved a small number of samples of 21 participants. Future studies could involve a larger number of research participants as well as exploring different age groups, and students at different music centres in the same region to strengthen the quantitative part of this research. Secondly, the nature of the study relies on subjective self-reported perception and sensation of young

participants. There was a risk for young participants struggling to feel the sensation or to articulate physical sensation. In this regard, a future study that involves objective physiological measurement devices may better validate the effect of SOVT exercise to complement the perception-based analysis. Third, the study was based on short-term observation of the post-effect of SOVT to the participants. A study that involves a longer observation period would provide deeper insight into how consistent training of SOVT would impact the development of the young singer's voice and singing techniques.

(Word count: 6,176 words)

VI. Appendices

Appendix A - Parental Consent Form

PARENTAL OR GUARDIAN CONSENT/PERMISSION FORM

Project Title: *Study on the perspective of singing students aged 10-12 years to Semi-Occluded Vocal Tract (SOVT) exercises*

Researcher: Dani W. Dumadi

Consent to take part in research

- I....., parent/legal guardian
of.....
voluntarily agree to have my child participate in this research study.
- I understand that even if I agree to have my child participate now, I can withdraw my child's participation at any time.
- I understand that both my child and I can refuse to answer any question involved during the research process without any consequences of any kind.
- I have been explained the purpose and nature of the study and have had the opportunity to ask questions about it.
- I understand that participation involves practical vocal exercises such as lip till, blowfish, straw-phonation etc, and interviews.
- I understand that my child and I may not benefit directly from participating in this research. I also understand that there will be no money involved that affects my child and me regarding participating in this project.
- I agree that my child's interviews and activities for this project are audio and video recorded.
- I understand that all information my child and I provide for this study will be confidential.
- I understand that in any report on the results of this research, my child's identity and I will remain anonymous. This will be done by changing my child's name and disguising any details of my child's interview which may reveal my child or the identity of the people he/she speaks about.
- I understand that signed consent forms and original audio and video recordings will be retained in the researcher's personal Google Drive until his grades from the university have been finalised.
- I understand that under freedom of information legalisation, I am entitled to access the information my child and I have provided at any time while it is in storage as specified above.
- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Signature of the parent/legal guardian of the research participant Date _____	Signature of researcher I believe the participant is giving informed consent to participate in this study.  Dani W. Dumadi Signature of researcher Date _____
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Appendix B - Interview Guide

Research title *Study on the Perspective of Singing Students Aged 10 to 12 to Semi-Occluded Vocal Tract (SOVT) exercises*

Name of the researcher Dani W. Dumadi (+62 812 3000 410, danidumadi@gmail.com)

Name of participant _____

Date of Birth _____ Age _____ yrs

Date of participation _____ Time _____

Location _____

Answer the following questions after each exercise:

A. Lip trill

Have you ever heard about this exercise before? _____ No / _____ Yes

Have you done it in the past? _____ No / _____ Yes, How often? _____

What do you think (first impression) about this exercise?

Is there any particular physical sensation after performing this exercise? What are they? And where is the sensation?

B. Tongue trill

Have you ever heard about this exercise before? _____ No / _____ Yes

Have you done it in the past? _____ No / _____ Yes, How often? _____

What do you think (first impression) about this exercise?

Is there any particular physical sensation after performing this exercise? What are they? And where is the sensation?

C. Blowfish

Have you ever heard about this exercise before? ____ No / ____ Yes

Have you done it in the past? ____ No / ____ Yes, How often? _____

What do you think (first impression) about this exercise?

Is there any particular physical sensation after performing this exercise? What are they? And where is the sensation?

D. Straw phonation without water

Have you ever heard about this exercise before? ____ No / ____ Yes

Have you done it in the past? ____ No / ____ Yes, How often? _____

What do you think (first impression) about this exercise?

Is there any particular physical sensation after performing this exercise? What are they? And where is the sensation?

E. Straw phonation with water

Have you ever heard about this exercise before? ____ No / ____ Yes

Have you done it in the past? ____ No / ____ Yes, How often? _____

What do you think (first impression) about this exercise?

Is there any particular physical sensation after performing this exercise? What are they? And where is the sensation?

After all these five exercises, do you feel any changes in your voice? Or are they just the same?

Which exercise is your favourite? _____

Why? _____

Which exercise is your least favourite (that you don't like the most)?

Why? _____

Kindly put these exercises in order based on favouritism.

A. Liptrill B. Tongue-trill C. Blowfish D. Straw phonation E. Straw phonation (water)

1. _____

2. _____

3. _____

4. _____

5. _____

Would you do all or any of these exercises on your own (without supervision) if your teacher asked you to? _____

If your teacher asks you to choose any of these exercises to be done on your own time at home, which of these exercises that you mostly going to do on your own?

Any particular reason?

-END-

Appendix C - Participants' Familiarity to SOVT

Question: Have you heard about it?					
Participant #	Lip - trill	Tongue - trill	Blowfish	Straw phonation	Water Resistance
1	Yes	Yes	Yes	No	No
2	Yes	Yes	Yes	Yes	Yes
3	No	Yes	Yes	No	No
4	Yes	Yes	No	No	No
5	Yes	No	No	No	No
6	Yes	No	No	No	No
7	Yes	No	Yes	No	No
8	Yes	Yes	Yes	Yes	Yes
9	Yes	Yes	Yes	Yes	Yes
10	Yes	Yes	Yes	Yes	Yes
11	No	Yes	No	No	No
12	Yes	Yes	No	No	No
13	Yes	Yes	Yes	No	No
14	Yes	Yes	No	No	No
15	Yes	Yes	Yes	No	No
16	Yes	Yes	No	No	No
17	Yes	No	No	No	No
18	Yes	No	No	No	No
19	Yes	No	No	No	No
20	Yes	Yes	Yes	No	No
21	Yes	Yes	Yes	Yes	Yes
	Lip - trill	Tongue - trill	Blowfish	Straw phonation	Water Resistance
Yes	19	15	11	5	5
No	2	6	10	16	16
	Lip - trill	Tongue - trill	Blowfish	Straw phonation	Water Resistance
Familiar	90%	71%	52%	24%	24%
Unfamiliar	10%	29%	48%	76%	76%

Appendix D - Participants' independent SOVT exercise preference

Participant	age	Would you do this on your own without supervision?	Code	if you "must do this exercise" (as homework, being graded, etc) which one would you do it? and why?	
Participant #1	12 yrs	yes	yes	Tongue trill	because it is the easiest
Participant #2	10 yrs	yes	yes	Blowfish	because it is simple and not using equipment, blowfish in random songs
Participant #3	11 yrs	hopefully	maybe	Blowfish	because it is easier, and doesn't required tools preparation
Participant #4	11 yrs	yes	yes	Water resistance	It's fun, it's my favourite one. because of the bubbles
Participant #5	12 yrs	yes	yes	Tongue trill	I can do it anytime
Participant #6	10 yrs	I'm not going to do it, these exercise are not something appealing.	no	Water resistance	because it's like playing
Participant #7	10 yrs	I would do it because there's an upcoming performing event	yes	Blowfish	because it is the easiest.
Participant #8	11 yrs	yes	yes	Water resistance	because it is fun, and has bubbles
Participant #9	12 yrs	I most likely don't have the motivation to do it at home. depends on the exercise. I kind of lazy to do it.	no	Lip trill	because this exercise is more familiar. I would not do the other exercises
Participant #10	12 yrs	Yes	yes	Lip trill	for just exercises, liptrill... (because) I like liptrill more...
Participant #11	10 yrs	I have too much activities, so probably no	no	Tongue trill	I would choose tongue trill because in lip trill there's the Ticklish sensastions
Participant #12	12 yrs	Yes, although, I would check on my time because I have lots of extracurricular activities. I'm very busy.	yes	Tongue trill	Because it is the easiest for me
Participant #13	12 yrs	of course	yes	Water resistance	because it was a lot of fun!
Participant #14	10 yrs	maybe	maybe	Lip trill	(I choose) liptrill because tongue-trill is too easy, so I would go to the next challenging one.
Participant #15	11 yrs	Yes	yes	Lip trill	because it is more simpler to do and doesnt require a lot of steps to do, so you don't need to prepare the materials, but you can just simply do it whenever you want to.
Participant #16	11 yrs	I would, but not tongue trill	yes	Lip trill	(I would do) lip trill and maybe straw phonation with water. For lip trill, I found it easy to do, and for water phonation, I just found it fun to do.
Participant #17	12 yrs	Maybe	maybe	Lip trill	Because you don't need anything to prepare.
Participant #18	10 yrs	not really	no	Water resistance	It kept bubbling and it was fun.
Participant #19	12 yrs	Yes	yes	Lip trill	because it is more familiar.
Participant #20	12 yrs	No, I dont like it	no	Blowfish	because it is the easiest
Participant #21	11 yrs	Maybe	maybe	Water resistance	Because it is fun and actually very easy

Appendix E - Participants' impressions comparing before and after five SOVT exercises

	Before & After impressions/ participants' perception/perspective	Is there any difference between before & after?	Code
Participant #1	there's a difference, I feel a bit easier to reach higher notes	Yes	easier
Participant #2	I feel easier to do the vocalization after the sovts exercises	Yes	easier
Participant #3	Yes, I feel difference, feels better after the exercise, more relaxed, more easier. I think it is due to the exercise	Yes	easier, more comfortable
Participant #4	Yes, I feel i can sing lauder and easier after the exercise	Yes	stronger, easier
Participant #5	Researcher's observation notes: Participant's sound after the intervention seems to be stronger and clearer and forward. the participant confirmed: I feel that after the exercises the singing becomes easier	Yes	easier
Participant #6	The check at the end of session wasn't done due to time limitation.		
Participant #7	Yes, I feel there's difference. I feel that before the exercise, my voice is wider, also I felt that it was heavier to sing before the exercise, while after the exercise, it was more easier to sing. I like my voice better after the exercise	Yes	easier
Participant #8	I feel a little different between before and after. It feels easier to reach the high notes. it is easier to sing and it is lighter to sing. Before this, it felt heavy.	Yes	easier, lighter
Participant #9	I cant tell the difference before and after teh exercises. I do feel that I can reach higher notes now compared to before the exercises. It feels a bit more easier to sing after the exercises.	Yes	easier, higher range
Participant #10	was not asked due to time limitation		
Participant #11	a bit more warmed up. because we are doing a different type of warm up. it is more easier to sing because it is feels more warmed up	Yes	easier,
Participant #12	a more stronger sound	Yes	stronger
Participant #13	I feel comfortable after these five exercises and my voice is a lot different	Yes	more comfortable
Participant #14	A bit more easier to sing.	Yes	easier
Participant #15	Yes, I feel changes in my voice. It is more comfortable to sing and I could reach the higher notes more comfortably.	Yes	more comfortable
Participant #16	After 5 exercises, my voice feels the same.	No	no effect
Participant #17	I don't feel any different. I feel that the lip-trill did some effect.	No	no effect
Participant #18	It was the same voice.	No	no effect
Participant #19	I dont think all these five exercises really helps. At first I thought that the second time I sing was because of the five exercises, but after I think about it, I think it is more because I already now more familiar with the given melody.	No	no effect
Participant #20	yes a little bit different. I don't know, suddenly it's hard to reach the hight notes. On the low notes it feels like you relieve (more easy to sing).	Yes	relieve on the low notes, harder to reach high notes
Participant #21	After the exercise, singing feels lighter, easier, and more comfortable. However, nerves might also contribute to discomfort during singing prior to the exercise.	Yes	lighter, easier, more comfortable

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