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COGNITIVE STRUCTURES OF MUSIC TEACHER CANDIDATES ABOUT "VOICE TRAINING"

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ABSTRACT

The study aims to examine the cognitive structures of music teacher candidates about voice training. To this end, a qualitative research method was used. The participants of this study consisted of 123 music teacher candidates studying at Necmettin Erbakan University, Turkey. Free word association test has been used as the data collection method. The stimulus word -voice training- was chosen and presented to music teacher candidates through a free word association test. A total of 43 responses were gathered and arranged in the form of word frequency tables. The obtained response words were then divided into 7 categories with the help of content analysis. The findings of the study revealed that music teacher candidates associate the chosen stimulus word -voice training- with the diaphragm, breathing, posture, resonance, technique, etc., and the categories created using response words such as the respiratory system, voice training methods and techniques, reflective system and so on. According to these results, it can also be said that there are some deficiencies in which students make valid associations with the stimulus concept of voice training. The examples of the sentences that the students have formed regarding the voice training stimulus concept were examined and it was determined that the sentence samples containing the non-scientific or superficial knowledge and misconceptions are in the majority compared to the sentence samples containing the scientific facts; which is a conflicting outcome deemed significant.

Keywords: *Voice Training, Cognitive Structure, Free Word Association Test, Music Teacher Candidates.*

INTRODUCTION

One of the most commonly used, effective and valuable tools in music education is the human voice. Vocalization for human beings is a means of self-expression, communication and negotiation. Although the ability to sing can be both an innate talent and a venue for life-long involvement, it is essentially necessary to train the voice by following certain goals and raise awareness towards vocal health and protection. Voice training is thus very important in both speaking and singing.

Nature may not bestow everyone with a "beautiful voice", but with proper voice training, practically anyone can have a listenable voice. Voice is often the most reliable instrument of a music teacher; and besides, it is an instrument that (except in extreme cases of severely disabled individuals) cannot be done without throughout life (Şimşek, 1994). Voice training has an important place for achieving the goals in the professional career of music teacher candidates. That is to say, the greatest asset in their profession undoubtedly is their voices. A singing voice is among the most used tools by music

teachers in the process of creating behavioural changes in students in accordance with the objectives of music education. Therefore, the improvement of this tool is of great importance. Refining the voice as an educational tool can be realized via the established principles of voice training.

According to Çevik (2013), the principles of voice training are listed as follows: In addition to inculcating breathing habits in the individual, a consciousness towards vigilance, relaxation and awakening, as required for accurately and sounded with clarity, then enlarged by sending it to the appropriate resonance zones to strengthen and enrich it in terms of its tonal naturality, wherefore it would then be expected to gain a smooth-aesthetic quality. A person should be cultivated with the ability to speak the language loudly, clearly and understandably, and also must be increased in skill with good articulation, diction, eloquence, and expressive intonation for singing. An individual's existing musical sensitivity should be improved in so far as effective voice-interpreting skills are possible to attain. The individual should be informed about the organs that are functional in voice production, recognize their respective roles, and achieve the coordination between these organs as well as learning about their health protection.

Cognitive learning experiences have an important place in the education process of the individual. In this context, the aim of this implementation is to contribute the cognitive development of the individual as well as fostering their affective and kinaesthetic development through voice training applications. The main principle should be the transformation of voice training practices and activities, mostly considered as abstract procedures, into concrete procedures and practices which will make learning easier and more permanent (Helvacı, 2003). In this way, cognitive learning processes such as attention, imagination, perception, memory and insight can be developed and contributed in voice education.

Recently, different techniques and strategies have been introduced to increase the effectiveness of the constructivist learning approach in educational environments and eliminate the deficiencies of traditional assessment techniques in measuring conceptual understanding and change (Ercan, Taşdere, & Ercan, 2010). Researchers have run techniques to measure not only the knowledge of students but also the extent of which they reveal the relationships between different sources of knowledge and concepts, cognitive structures, the knowledge they create in their minds and the functioning of events in the real and natural world. In this context, the techniques determining the cognitive structure of students and the connections between a given set of the concepts within such a structure have gained importance (Bahar, Nartgün, Durmuş, & Bıçak, 2006; Ercan et al., 2010; Erdoğan, 2017). The Free Word Association Test (FWAT), being one of these techniques, has been used in the field of music education to reveal the cognitive structure of students to identify misconceptions (Gerekten, 2018).

When the previous researches are investigated, it is seen that the researchers use the FWAT technique mostly to identify cognitive structures of students before and after education and reveal any changes in their cognitive structures as a result of voice education. Although there are many studies conducted through the FWAT, there is a lack of research about voice training applications in the literature.

The purpose of this research is to determine the candidates' conceptual structures about the concept of "voice training" using a free word association test. For this purpose, in this study, the question of "How are the conceptual structures of the candidates regarding the concept of 'voice training'?" is searched for an answer. It is very important to determine how they form links between the concepts in their cognitive structures during education. Such a study is needed to determine how the concepts and information taught in voice training, which is a performance-oriented training, are coded in minds and what kind of connections are established.

METHOD

Study Design

In this study, the phenomenological pattern as a qualitative tool has been utilized. Phenomenological studies are used to investigate the facts that we are aware of but do not have an in-depth, detailed understanding of. Phenomenological studies may reveal examples, explanations and experiences to help better comprehend a phenomenon although it does not reveal well-definable, generalizable results (Yıldırım & Şimşek, 2006). Phenomenology can be defined as the study of experiences of individuals taking their views into account (Kuzu, 2013).

Participants

The study group consisted of 123 music teacher candidates enrolled in Necmettin Erbakan University, Turkey during the 2017–2018 academic year. The candidates take one hour-voice training lesson weekly during the 1st and 2nd years of their undergraduate program throughout 4 terms. Voice training is a performance-oriented lesson and pedagogical information is also given during this lesson.

Table 1
Distribution of the study group according to gender, year and principal instrument

	Group	f	%
Gender	Female	72	59
	Male	51	41
Year	1st	34	28
	2nd	30	24
	3rd	32	26
	4th	27	22

Table 1 shows the distribution of music teacher candidates according to their gender, year and principal musical instruments. A total of 123 teacher candidates, 72 (59%) of them being female and 51 (41%) of them being male, contributed to the study. In making up the total, 34 (28%) of the first-year teacher candidates, 30 (24%) second-year teacher candidates, 32 (26%) third- year teacher candidates and 27 (22%) fourth- year teacher candidates participated in this research.

Data Collection Tool

The data were collected using Free Word Association Test. With the FWAT, it is aimed to collect detailed data on the participants' conceptual structures about voice training. The FWAT consists of two steps in which the participants have to write the first ten words regarding the stimulating word within a given period of time and are secondly asked to write sentences about the stimulant word. As the stimulus concept, "voice training" was presented to music teacher candidates as seen in Table 2, written 10 times under each other. (See Table 2). The participants were then asked to write down what the concept brings to mind. The reason for the stimulus concept being written one after the other in ten rows as the number of desired responses was to avoid the risk of chain responses. In this way, going beyond the purpose of the test would be prevented. Studies using the FWAT have been examined and the appropriate response time for the stimulus concept has been decided as 30 seconds (Bahar et al., 1999). Necessary explanations and examples had been given to the candidates to help them understand the free word association test better before the test.

Table 2
The FWAT excerpt featuring the stimulus word "voice training" 10 times in succession

Stimulus Concept: VOICE TRAINING
VOICE TRAINING:.....
VOICE TRAINING:.....
VOICE TRAINING:.....
VOICE TRAINING:.....
VOICE TRAINING:.....
VOICE TRAINING:.....
VOICE TRAINING:.....
VOICE TRAINING:.....
VOICE TRAINING:.....
VOICE TRAINING:.....

In the second phase of the test application, writing a sentence about the stimulus concept is considered important, and these sentences have been examined one by one at the analysis stage. Because the response associated with the stimulus concept may also be a connotation product that does not have a meaningful relationship with the stimulus concept at the level of the participant's recollection (Nartgün, 2006).

Besides, since the related sentence will be more complex and elaborate compared to a single word response, whether the sentence is scientific or contains various misconceptions will affect the evaluation process. In this technique, the student gives responses that a given stimulus concept evokes in his mind within a certain period of time. It is presumed that the sequential response in which the student delivers any stimulus concept from his long-term memory reveals the connections between cognitive construct concepts and shows semantic proximity. According to the effect of semantic proximity, in semantic memory, the closer the two concepts are to each other in terms of distance, the faster the mental search during recollection and the faster the participant's conscious reaction to both concepts (Bahar et al., 1999).

Data Analysis

In this study, for analysing the data, the responses given by the participant teacher candidates to the chosen stimulus concept have been analysed with the content analysis and categories were formed using the received response words. Next, frequency tables of the response words were formed.

In this paper, the researchers attempt to validate how the test is applied to music teacher candidates, how the data is collected, and how the results are obtained from the data. To reiterate, throughout this research, the response words associated with the stimulus concept "voice training" as written down by the teacher candidates have been examined and the main categories were formed according to these response words. In other words, the response given by the teacher candidates is placed in the appropriate categories. After these procedures, the categories and response words associated with the stimulus concept in these categories have been verified by a specialist. Reliability was calculated using the formula [Consensus / (Consensus + Divergence) x 100]) (Miles & Huberman, 1994). As a result of this independent verification, reliability has been ensured at 90%. In this way, a data analysis technique used by this research has been found to give reliable results (Erdoğan, 2012).

Additionally, to ensure the reliability of the research, the researchers tried to explicitly state the participants, the processes of data collection and analysis, obtained results and findings. The words that seem irrelevant or are mentioned only once are not taken into consideration. Low-frequency words with similarity in meaning are combined. The words are then categorized using the semantic relation criterion, and their frequency of occurrence is calculated.

FINDINGS

A total of 7 categories were formed from the words determined as a result of the analysis of the data obtained by using the FWAT for the cognitive structures of music teacher candidates about the concept of "voice training". These categories and the words listed in each category are presented below. Some of the candidates did not write words for all 10 response words. 5% (50 response words) of the mentioned words are not included in the categories because they were either superfluous or similar to other stimulus concepts. 43 different words regarding the concept of voice training are therefore divided into 7 categories, while a total of 779 response words have been obtained.

Table 3
The categories formed from the response words given to "voice training" stimulus concept and the frequency of occurrence under each one

Item no	Categories	f	%
1	Respiratory system	191	25
2	Voice training methods and techniques	132	17
3	Reflective (resonator) system	127	16
4	Voice quality	104	13
5	Voice training components	83	11
6	Vibration system	74	9
7	Voice health	68	9
	Total	779	100

As a result of the analysis of the obtained data, the responses of the teacher candidates to the concept of "voice training" have been gathered under 7 categories as shown in Table 3. Most of the responses occur in the first category, "respiratory system" (f=191, 21%), and the least ones occur in the seventh category, "voice health" (f = 68, 7%).

Table 4
The response words under the respiratory system category

Category	Words	f	%
1. Respiratory system	Diaphragm	109	54
	Breath	68	33
	Lung	10	5
	Abdominal muscles	2	1
	Rib cage	2	1
	Total	191	100

In Table 4, the responses from music teacher candidates to the concept of "voice training" for the first instance, have been grouped under the "respiratory system" category, and it can be seen as the dominant category (f = 191, 21%). In this category, most of the teacher candidates concentrate on the respiratory system related words: i.e., "diaphragm", "breath", "lung", "abdominal muscles", "rib cage". The reason for the use of these words by the candidates may be due to the fact that the organs that make up this system in the fulfilment of respiratory functions during the formation of sound, as well as the basic principle behind "beautiful singing", are contingent upon the right breathing habits.

Table 5
The response words under the voice training methods and techniques category

Category	Words	f	%
2. Voice training methods and techniques	Posture	66	50
	Pronunciation	27	20
	Position	14	11
	Body	11	8
	Systematic study	9	7
	Self-confidence	5	4
	Total	132	100

In Table 5, the responses of participant music teacher candidates to the "voice training" concept have been gathered under the second category "voice training methods and techniques" (f = 132, 14%). Most of the candidates in this category focus on "posture", "pronunciation", "position", "body", "systematic study", "self-confidence". The words "posture", "position" and "body" represent basically the same behaviour. According to the response words, it may be thought that posture is very important in voice production and "good singing". Pronunciation which takes place in speaking training, one of the voice training types, is an important feature in the clarity of language and the effectiveness of utterance. It is thought that the words of systematic study and self-confidence in voice training process are chosen as the supportive elements by the candidates in terms of acquiring voice training methods and techniques.

Table 6
The response words under the reflective (resonator) system category

Category	Words	f	%
3. Reflective (resonator) system	Mouth	41	32
	Palate	32	25
	Tongue	23	18
	Nose	12	9
	Tooth	9	7
	Lip	5	4
	Sinuses	3	2
	Chin	2	2
	Total	127	100

In Table 6, the responses of the candidates to the "voice training" concept have been gathered under the third category "reflective (resonator) system" (f=127, 14%). Most of the candidates in this category have stated the words; "mouth", "palate", "tongue", "nose", and "tooth". Mouth, palate, nose, sinuses are the organs that provide the resonance, but also the words "mouth", "palate", "tongue", "nose", "tooth", "lip", and "chin" may be used with the thought that speech organs support articulation.

Table 7
The response words under the voice quality category

Category	Words	f	%
4. Voice quality	Technique	33	32
	Head voice	22	21
	Intonation	18	17
	Register	12	12
	Vibrato	10	10
	Tone	9	9
	Total	104	100

In Table 7, the responses of the music teacher candidates to our "voice training" stimulus concept have been gathered under the fourth category "voice quality" (f = 104, 11%). In this category, the candidates have expressed such response words; "technique", "head voice", "intonation", "register". "vibrato" and "tone". It is thought that the response words "technique", "intonation", "vibrato" and "tone" are used as definitions that affect voice quality. The word "register" and "head voice" may have been used because they express vocal regions in voice training.

Table 8
The response words under the voice training components category

Category	Words	f	%
5.Voice training components	Resonance	50	60
	Articulation	27	33
	Respiration	4	5
	Phonation	2	2
	Total	83	100

In Table 8, the responses of the participnts to the "voice training" concept have been gathered under the fifth category "voice training components" (f=83, 9%). In this category, they have stated the words "resonance", "articulation", "respiration" and "phonation". The role of proper breathing habits in the production of a quality voice cannot be denied, therefore, the voice trainers should dwell on the subject studiously (Helvacı, 2003). This response word might have been used in our opinion, to the extent that the behaviour that should be given priority in voice training is the audit and control of respiration. It is thought that "phonation", "resonance" and "articulation" words are used because with correct respiration methods, as a result of proper phonation, increasing the richness of timbre, and gaining mastery over the movements of speech organs they work in coordination systematically and incoordination.

Table 9
The response words under the vibration system category

Category	Words	f	%
6. Vibration system	Vocal cords	33	45
	Larynx	33	45
	Vibration	8	10
	Total	74	100

In Table 9, the responses of the music teacher candidates to the "voice training" concept have been gathered under the seventh category- "vibration system" (f = 74, 8%). In this category, the candidates have stated the words "the vocal cords", "larynx", "vibration". Since the larynx region is the region where the sound is first formed by vibrating "the vocal cords", "larynx", and "vibration"

words appear to have been used. There are vocal cords on the inner surfaces of the sound muscles in the larynx, which is composed of cartilage and muscle tissues (Köse, 2001).

Table 10
The response words under the words in voice health category

Category	Words	f	%
	Voice exercise	23	34
	Voice health	11	16
	Emotion	7	10
	Coordination	6	9
	Breathing exercise	5	7
7. Voice health	Nodule	4	6
	Sports	3	4
	Individual	3	4
	Hydration	2	3
	Body exercise	2	3
	Condition	2	3
	Total	68	100

In Table 10, the responses of the music teacher candidates to the "voice training" concept have been gathered under the seventh category "voice health" (f = 68, 7%). Most of the participants in this category have stated the words "voice exercise", "voice health", "emotion", "coordination" and "breathing exercise". The first stage of voice training is to relax the body with stretching exercises, whereafter breath and voice exercises are applied to improve, strengthen and give flexibility and endurance to the individual's voice.

The words "voice exercise", "breathing exercise" and "body exercise" might have been used based on this understanding. Repetition of the word "emotion" may be due to the fact that emotional factors can cause muscle tension imbalance, and this may adversely affect the voice organ. The word "nodule" might have been used because it is the most common among voice infirmaries encountered when the voice is not used correctly. It is thought that, for a healthy voice, it is important to do regular sports, physical conditioning and adequate fluid intake (hydration). Coordination and individual words can be chosen as words that define the way in which the body, breathing, and voice exercises are performed

Table 11
The example sentences by students regarding the "voice training" stimulus word

Example sentences with scientific knowledge	Example sentences with non-scientific or smattering knowledge	Example sentences with misconception
- Using posture, the diaphragm in voice training is important to achieve a correct technique. - Vocal training is one of the lower levels of voice training. - Mouth, nose, teeth and palate are important in the formation of the human voice. - Articulation is as important as the correct formation of the voice. - A false and compelling voice training may result in the formation of nodules. - Voice resonates in the resonance cavities by being supported via breath. - Body and voice exercises should be performed before you start singing for a healthy voice. - To make a strong sound, one needs to increase his breath support. - The diaphragm is like a parachute that separates the chest and abdominal cavities. - The position of the palate varies with the vocals.	- We need to know the technique of singing to sing right. - The most difficult thing for me when it comes to singing is to use the breath correctly and not to interrupt the posture. - Voice training aims to use sound correctly. that There are concepts such as diaphragm training, using resonance regions. - I do not know foreign languages, and I find it difficult to pronounce the lyrics. - I look forward to saying the right parts in Italian with attention to the legatos. - Apart from the technical characteristics, self-reliance is also effective in voice training. - I pay attention to mouth opening and posture in voice training. - In the technical sense, many things deteriorate when the stance is broken. - I usually use head tones in high-pitched sounds. - Training voice means speaking nicely. - I sing with my diaphragm and hold my breath.	- The better we use our vocal cords and thighs, the better we sing. - Proper sound is extracted by pushing the sound out with proper breathing. - The main purpose of voice training is to learn to use the diaphragm correctly. - Clean voice means quality voice. - Voice is technically a whole. - Open your mouth as much as you do. - The posture position in voice training is very useful in developing the diaphragm and vocal cords. - We should take the breath from the diaphragm, not the chest. - It is very important to operate the diaphragm with the help of breathing in voice training. - I can breathe as much as I can before I start singing. - It is necessary to breathe through the nose while singing. - I sing more comfortably in the chest.

Table 11 shows some examples of music teacher candidates' explanations regarding the concept of voice training. Considering the contents of the sentences mentioned in Table 11, it is seen that the candidates write sentences regarding each category, but they also write sentences containing misconceptions about the concept of voice training. It is understood from these sentences that the participants have various misconceptions about voice training. Some non-scientific, incomplete and inaccurate knowledge about the explanations of voice training are shown in Table 11. The most frequently repeated sentences include the words diaphragm and breath containing misconceptions.

DISCUSSION

In this study, the cognitive structures of a total of music teacher candidates about the concept of voice education are examined with an independent word association test, and the findings reveal how they link the concept of voice education with other words, which expressions or descriptions are given as the most common response, and which concepts are not mentioned through analysis of sentence examples by categories.

Töreyin (1998) has revealed that some of the voice training experts he has interviewed distinguish between the "practice" and "theoretical knowledge" dimensions of vocal training which is a combination of art and science or they think that vocal training can only be done through "imitation" and "master-apprentice" method. While a voice trainer is giving information to his student about how to use her voice, he uses many terms that are estranging to the student. Yet, the student generally comprehends most of these terms and does not have difficulty in understanding.

According to Brown (2000), students should learn how to produce the correct voice instead of imitating as one of the principles of voice training. Erdoğan (2008) has revealed that candidates'

knowledge about the terms and idioms frequently used in the voice training is generally at a medium level. The majority of the lecturers attending the individual voice training lesson have argued that the theoretical training in the music education departments during the voice training process is insufficient and that the efficiency and speed will increase if the theoretical knowledge is given more space. In addition, the other results obtained are that foreign terms are not permanent in the minds of students, while abstract concepts cannot be perceived by the students. Lack of time, lack of material, students' indifference, and inadequacy of teachers' voice training terminology is an important problem and deficiency.

In the "respiratory system" category, the most obvious response word is "diaphragm". The primacy of the word "diaphragm", which is the most conspicuous muscle of the respiratory system as an organ providing respiratory audit and control, is not surprising. The second most repeated word, "breathing", is consistent with the "singing over one's breath" phrase, which relates the importance and necessity of respiration support in singing. Not surprisingly, the first thing a student should learn is how to use his/ her breath, since right breathing is the basis of creating a "beautiful voice". However, the frequencies of words "lung", "abdominal muscles" and "rib cage" stated by candidates are not at the expected level when respiratory support for voice training involves abdomen and obliques. The fact that the words "trachea" and "bronchi" having a cardinal role in the respiratory functions of voice formation are not mentioned at all shows that the candidates lack the conceptual knowledge about the respiratory system. According to Ömür (2001), the power source of voice is the lungs, rib cage, back, chest and especially abdominal muscles. These muscles work harmoniously and pump the air like a bellows. In general, all of these organs are called diaphragms.

Secondly, it is seen that the participants focus on the words in the " voice training methods and techniques" category. The response words in this category are "posture", "pronunciation", "position", "body", "systematic study", "self-confidence". When the related words are examined, the words that give dynamics, nuance, flexibility and mobility to voice (such as "forte", "piano", "legato", "staccato", "crescendo", "decrescendo", "accelerando", "decelerando", "a tempo") are not mentioned. The candidates' not giving the expected response words after posture, pronunciation and position in the "methods and techniques of voice training" category shows that they have deficiencies regarding the voice training concept as well as methods and techniques of voice training.

According to McKinney (1994), good posture facilitates the operation of vibrators and resonators and ensures that they function optimally. Correct and balanced body posture gives the person a sense of comfort, courage and confidence when there is a habit of singing. It can be a psychological value and an important feature for the education of voice. According to Öztürk (2003), a music teacher needs to develop his/her voice as an important assistant for him/her, with the modern voice training techniques and methods, and encourage the students to apply these methods and techniques.

The third most frequently associated words with "voice training" by the candidates are given under the "reflective (resonator) system" category. In this category, the words are "mouth", "palate", "tongue" and "nose". The nose incidentally forms the top part of the respiratory system. Mouth, nose, palate and sinuses are the expected words, as they are the organs providing resonance. Mouth, nose, palate work along with lip, tongue and chin in creating articulation as speech organs, where they are among the expected response words. Yet, in this category, respiratory system organs, "trachea", "pharynx" and "chest" are the expected responses but they are not mentioned.

The resonator system is a sound system that includes modifiers and articulators that give the sound its personal quality and provide sound forms. They are involved in both speaking and singing. There are at least seven resonator zones in the human body. When they are aligned from the lowest part of the body to the highest part, these regions are; chest, trachea and bronchi, larynx, pharynx, oral cavity, nasal cavity and sinuses. The chest and sinuses, although vibration can be felt in these areas and were thought to be important in the past, do not make a special contribution to external sound. The trachea and bronchi and larynx provide some support for sound, but they are not under conscious control and may be considered to be of secondary importance. The most important resonators in

human voice are pharynx and mouth, and more limitedly the nasal cavity. Pharynx and mouth; they are the most important resonators due to their position, size and degree of adjustment (McKinney, 1994).

According to the findings, it is seen that the fourth mostly associated words in the "voice training" are related to "voice quality". The associated words having the highest number here are "technique", "head voice", "intonation", "vibrato", "tone", and "register". When the response words are examined, it is seen that teacher candidates have mastered the basic concepts regarding voice quality.

In a study conducted by Timmermans, Bodt, De, Floris, & Heyning (2005), it was revealed that the voice training studies (natural posture, relaxation, breathing support, advanced articulation, sound reflection) were effective in changing the voice quality. Studies show that for a quality sound production, respiratory system, vibrator system and resonator system should work in perfect harmony (Helvacı, 2003).

Another category titled "voice training components" cover all common areas that are fundamental to behaviours gained during voice training. When the words associated with the stimulus concept in this category "resonance", "articulation", "respiration", and "phonation", are examined, it is seen that the frequencies of the words given by teacher candidates are not at the expected level. In particular, the frequency of occurrence of "breathing" and "phonation" that are expected to be at the highest frequency in this category is remarkable. With the lack of adequate conceptual knowledge of the candidates in the first category- i.e., the respiratory system learning area- the frequency of occurrence of respiratory basic behaviour response words in the fifth category of voice training components was found to be significant.

Yet another category associated with the word "voice training" is "vibration system". The response words in this category are "vocal cords", "larynx", "vibration", and when the associated words are examined, the word "larynx" is repeated at a low frequency of occurrence. It should not be forgotten that knowing the voice production source enables using the voice more consciously.

When the responses given under the category of "voice health" which has the lowest frequency are examined, emphasizing voice protection methods is an important part of voice training. Body exercise, breathing exercise, and voice exercises play an active role in the preparation of voice training to reduce the tension of muscles and joints. For the candidates who use their voices actively, voice health needs to be emphasized. These responses from the participants were highly expected. Ekici (2008) in the study on developing an individual voice training course in the education of music teachers has deduced that the emphasis should be given to applications regarding theoretical content (etc., voice health and protection) in line with the opinions of instructors, students and music teachers.

When the sample sentences given by the participants about the "voice training" stimulus concept were evaluated, it was seen that the majority of sentences have non-scientific smattering and are full of misconceptions (Table 11). This situation shows that the candidates have not learned about the scientific definition of the concept and they obviously have not structured the subject in their minds based on sufficient understanding. It was particularly noticed that the candidates experience misconceptions about the use of the word "diaphragm" and "breath" regarding the voice training concept.

The basic fact of the singing breath is the diaphragm. It is thought that the voice trainer should place enough importance on explaining the subjects of diaphragm and breath. There are also examples of sentences containing scientifically accurate information. Here, the candidates tried to explain the voice training concept in scientific terms. This result shows, in contrast, that a portion of the participants have cognitive structuring at some academic level when it comes to the concept of voice training.

CONCLUSION AND RECOMMENDATIONS

To recapitulate, the participants have been asked what the voice training stimulus concept meant to them, and 65 different responses were obtained. When the collected response words were examined, it was noted that the most frequently repeated 12 words have been diaphragm (f = 109), breath (f = 68), posture (f = 66), resonance (f = 50), mouth (f = 41), vocal cord (f = 33), larynx (f = 33), technique (f = 33), palate (f = 32), articulation f = 27), pronunciation (f = 27) and tongue (f = 23). The response words have been classified under 7 categories- "respiratory system", "voice training methods and techniques", "reflective (resonator) system", "voice quality", "voice training components", "vibration system", and "voice health". When the categories are scrutinized, it is seen that the response words delivered by the participants contain the outlined subjects included in voice training as part of the music education curriculum, and the music teacher candidates largely have sufficient vocabulary regarding voice training even though they seem to lack some knowledge about each category. When the response words regarding the concept of voice training are examined, it is seen that the candidates more or less understand the concept of voice training correctly but they have partly deficiencies, and they do not generally have sufficient scientific information in forming sentences. One may therefore conclude that word association tests are an effective technique for revealing about the cognitive structure and determining uncovering deficiencies and misconceptions.

The following recommendations are made according to our research results. In the voice training process, applied voice studies (which is the basis that constitutes correct voice development) and solid technique should be given precedence mindfully and patiently, while the anatomical structure which constitutes voice, as well as voice training and its qualification, also gets to be explained and taught. For this purpose, visual, audio and written materials can be used. Thus, seemingly abstract and challenging concepts can hopefully become more readily understandable. By guiding teacher candidates to conduct research on voice training during certain periods of their learning, the things they learn may become permanent. Techniques such as undertaking an interview with word association tests and creating concept maps can be used to reveal how the students build their relations between the concepts, and to understand which assumptions they have in their minds. In this way, the findings and relations obtained by the word association tests can be interpreted in a more qualified way.

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