

EDUCATIONAL ROLE OF TEACHERS' VOICE AND PERFORMANCE- CHANGING TEACHERS' ATTITUDE TOWARDS THEIR VOICE IN FIELD CONDITION

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Abstract

Considerable research has been done concerning the prevalence of vocal problems and disorders among teacher students and teachers. All research shows that voice disorders are very typical and are mostly connected to external factors such as environmental factors associated with vocal loading, health-related factors and stress-related factors. How voice disorders are connected to speakers posture, use of resonance and registers has not yet been studied. The primary prevention of voice disorders refers to elimination of circumstances that might cause a voice disorder, involving also teaching vocal hygiene strategies, while secondary prevention involves early detection and treatment of voice disorders. This article shows how teachers' attitudes towards their voice in field condition can be changed by giving them new models of (1) vocal hygiene strategies and (2) vocal exercises, combined to the Eerola ABC and balance-method and the Pilates-method. The article also gives a model to incorporate such training for all new teachers, for example in Tallinn University.

Key words: *teachers, voice disorders, Eerola-balance-method, Eerola ABC-method, Pilates-method.*

Introduction

The importance of the voice as an occupational tool in a number of professions today is unambiguous. The creative, hearing and functioning relationship between teacher and student is based primarily on speech, intonation and verbal skills. When using the voice most effectively, teacher possesses both substance and form of the words- the speech and the voice-and is conscious about the influence of both of his voice and performance and also about possibilities to improve the voice and performance.

The voice sculpts the word, and the word's task is to teach. The qualities of the voice effect the word, content of the text and the energetic pureness of the thought. If the voice apparatus is not in order, then the transmissive signal from it is low. Every person can cultivate, shape, cure and make the clearness and cogency of the word perfect. Misusing the word (cursing, lying, harassment etc.) damages and exoriates the potential of the signal of the word. The magic of the word has been for ages the weapon and tool of education for the teacher. But there have always been also more practical and technical side- how to use all of the potential of the voice apparatus to make the word make his way out of the voice into the student, staying as pure as possible.

Because human being is a psychophysical unity, we have to consider also person's feelings and physical condition and their affects to the speech organs work and it's expressional possibilities.

This article will explain also a thesis of healthy voice habits of the teacher. Recent researches have also noticed that the emotions make a significant role in making decisions in everyday life as brain and logic (Damasio 1994, Toivanen et al. 2004). Emotions are the most complex part of extra- and paralinguistic information, because they give the colour to the language and can change the meaning of the message (Slobodan et al 2004). In our society the intellect has very high social status and it creates beneficial soil to isolate emotional experiences from thinking. These conditions crop out in two ways- the emotions will be pushed down, which will occur muscle tensions or emotions will be completely identified and expressed, letting them dominate. Recent researches in Estonia have noticed that most students discern school climate and therefore also climate of the lesson as cold and usually boring; don't have confidence in teacher or perceive, that teachers dislike them, and that teachers subsist is only a little better than students (Ruus et al 2007 : 48-51).

The writer is a lecturer of voice in Tallinn University. In my work I have noticed that there should be more basic knowledge of the vocal hygiene strategies. My strategy has been developing new models of (1) vocal hygiene strategies and (2) vocal exercises. This article will present my models, based to Eerola ABC-method and Pilates-method. The aim of developing these models is to find out if these theses could be incorporated in obligatory basic studies for all new teachers, for example in Tallinn University.

Background Factors of Voice Disorders in Teachers

The awareness of voice disorders as a work-related disease has increased, and voice disorders have been accepted as occupational disorders in some European countries, even if not as a rule (Vilkman, 2004). Still, health care and occupational safety for professional voice users are poor, and the duty to prevent voice disorders falls on the employee (Vilkman, 2000). This indicates that voice problems are mainly seen as personal problems that have been caused by one's own voice limitations or by abuse of the voice. In order to develop occupational voice care for those who work in vocally demanding professions, it is essential to demonstrate the relationship between voice use and voice disorders (Rantala, Vilkman, & Bloigu, 2002; Sala, Laine, Simberg, Pentti & Suonpää, 2001; Södersten, Granqvist, Hammarberg, & Szabo, 2002; Vilkman, 2004).

Teaching as a profession places high on voice endurance because of the need to speak loudly for long periods, often under unfavorable circumstances caused by loud background noise and poor acoustic conditions (Pekkarinen & Viljanen, 1991; Rantala, Paavola, Körkkö & Vilkman, 1998; Sapienza, Crandell & Curtis, 1999). The teaching voice has been of special interest in several studies conducted in different parts of the world. The results of these studies show that teachers frequently report vocal symptoms (e.g. Pekkarinen, Himberg & Pentti, 1992; Roy, Merrill, Thibeault, Parsa, Gray, & Smith, 2004; Russell et al., 1998; Sala et al., 2001; Sapir et al., 1993; Smith et al., 1997).

The literature on voice disorders has proposed a variety of definitions of what should be considered as a voice disorder. A broad definition of self-reported voice disorders used in a recent study by Roy, Merrill, Thibeault, Parsa, et al. (2004) was "any time the voice does not work, perform, or sound as it normally should, so that it interferes with communication". Although the questionnaires used in different studies vary considerably, the results are in broad agreement as to the self-reported vocal symptoms. The most frequently reported vocal symptoms in several studies seem to be voice tiring, hoarseness, sensations of pain or discomfort in the throat, weak voice and lower pitch (Pekkarinen et al., 1992; Roy, Merrill, Thibeault, Gray et al., 2004; Sala et al., 2001; Sapir et al., 1993; Smith et al., 1997; Smith, Lemke, Taylor, Kirchner, & Hoffman, 1998).

The results of a study by Pekkarinen et al. (1992) showed that 12% of the teachers reported one vocal symptom and 5% reported two symptoms or more occurring weekly or more frequently during a two-year period. In a study by Roy, Merrill, Thibeault, Parsa, et al. (2004), 58% of the teachers reported that they had experienced adverse vocal symptoms during their lifetime, and 11% reported current symptoms. In some studies reporting the prevalence of current vocal

symptoms, the frequency of symptoms is higher with about 30% of the teachers reporting two symptoms (Smith, Lemke et al., 1998) to 52% of the teachers reporting three or more symptoms (Sapir et al., 1993).

Questionnaire studies reporting vocal symptoms among classroom teachers and daycare center teachers performed from 1992 to 2001 are presented in Table 1.

Table 1. Prevalence of vocal symptoms among teachers.

Authors	N	Symptoms occurring	Percent of teachers reporting symptoms
Pekkarinen et al., 1992	478	Weekly or more frequently over a two-year period	12% (one symptom) 5% (two or more symptoms)
Gotaas & Starr, 1993	201	Symptom at least once a month	28%
		Symptom at least once a week	12%
Sapir et al., 1993	237	Current symptoms	22% (one to two symptoms) 52% (three or more symptoms)
		Career-linked symptoms	26% (one to two symptoms) 33% (three or more symptoms)
Smith et al., 1998	242	Current symptoms	26% (one symptom) 43% (two or more symptoms)
Smith, Lemke et al., 1998	554	Current symptoms	20% (one symptom) 30% (two or more symptoms)
Russel et al., 1998	877	Every six months or more frequently during the career	22% (female); 12% (male)
		Every 2-3 months or more frequently over a one-year period	23% (female); 14% (male)
		On the day of the survey	18% (female); 12% (male)
Sala et al., 2001	262	Symptoms weekly or more frequently over a one-year	54% (one symptom) 37% (two or more symptoms) period
Roy, Merrill, Thibeault, Parsa, et al., 2004	1243	Symptoms during lifetime	58%
		Current symptoms	11%

Of the studies mentioned in Table 1, two study populations included an unspecified number of daycare center teachers (Russel et al., 1998; Sapir et al., 1993). In the study by Sala et al. (2001), which focused entirely on daycare center teachers, 54% of the teachers reported one symptom and 37% reported two symptoms or more occurring weekly or more frequently during the past year. This study also included a phoniatric examination of all the 262 participants. The results of the examination revealed that almost 30% of the daycare center teachers had organic findings on their vocal folds.

Teachers are not necessarily very active in looking for help. Studies show that only a small percentage of teachers who report voice problems seek professional help (Roy, Merrill, Thibeault, Parsa, et al., 2004; Russel et al., 1998; Sapir et al., 1993; Smith, Lemke et al., 1998). Teachers might also be ignorant about where to get help, or perhaps help is not easily available. Teachers might think that their voice problems are a normal inconvenience in their occupation (Morton & Watson, 1998; Russel et al., 1998; Sapir et al., 1993), which may account for why they do not seek help at an early stage. Another reason for ignoring to seek early help may be that persons adapt to such adverse vocal symptoms as hoarseness (Sonninen, 1970). Voice disorders may also be difficult to diagnose. The results of a retrospective study by Hertegård (1988) showed that voice disorders are not necessarily always correctly diagnosed by primary health care units. Those receiving faulty diagnoses do not receive adequate treatment for their disorder.

The primary risk factors for voice disorders in persons who work in occupations where the voice is an essential tool is the need for prolonged voice use and factors in the working environment that can affect voice production (Sala et al., 2001; Vilkmán, 2000; 2004).

Environmental Factors Associated with Vocal Loading

Most of the communication in classrooms is verbal, and teaching involves sustained and extensive use of the voice, usually referred to as vocal loading. Teachers use a higher fundamental frequency (F0) during lessons than during breaks (Rantala & Vilkmán, 1999) and their F0 increases toward the end of the working day, which might be an effect of vocal loading (Rantala et al., 2002). Teachers report that they have had more vocal symptoms since they began teaching than they had previously (Sapir et al., 1993). These symptoms have been found to appear more often in the afternoon and at the end of the week (Pekkarinen et al., 1992; Sala et al., 2001), and voice quality appears to improve during the school holidays (Morton & Watson, 1998). These reports indicate that there is a strong connection between vocal symptoms and teaching.

As to laryngeal pathologies associated with occupations, vocal nodules has been found to be the most common pathology of both students and teachers, and teachers have been reported to have a higher incidence of vocal nodules than persons in other occupations (Coyle et al., 2001).

Prolonged voice use is not the only risk factor for voice disorders in vocally demanding occupations, for environmental factors, such as background noise, acoustic conditions and air quality, also contribute to voice disorders (e.g. Morton & Watson, 1998; Pekkarinen & Viljanen, 1991; Vilkmán, 1996). There are several sources of background noise in the classroom. Noise from the activity of the pupils and from ventilation and air conditioning can be disturbing. In addition, external background noise, such as noise from traffic or from the schoolyard, can be disturbing (Crandell & Smaldino, 2000; Knecht et al., 2002). Background noise affects the pupils' ability to perceive speech (Crandell & Smaldino, 2000). Accordingly, teachers have to raise their voice to ensure that their voices are heard in noisy and reverberant classrooms (Nelson & Soli, 2000; Pekkarinen & Viljanen, 1991). Studies have shown that teachers frequently report that they have to speak over background noise (Pekkarinen et al., 1992; Smith et al., 1997; Smith, Kirchner, Taylor, Hoffman, & Lemke, 1998), and teachers have even reported that they commonly feel that they have to shout in order to be heard at work (Ohlsson et al., 1987). Low air humidity also has a negative impact on voice production (Hemler, Wieneke, & Dejonckere, 1997; Vilkmán, Lauri, Alku, Sala, & Sihvo, 1997; 1998; Verdolini, Titze, & Fennell, 1994; Vintturi, Alku, Sala, Sihvo, & Vilkmán, 2003).

Health-Related and Stress-Related Factors

Infections of the upper airways caused by common colds constitute a general cause of temporary voice problems (Stemple, 1995; Woo, 1996). One factor implicated as cause of voice problems among teachers is that they are frequently exposed to viruses associated with upper respiratory tract infections (Sala et al., 2001; Smith et al., 1997). The results of a study by Roy, Merrill, Thibeault, Parsa, et al. (2004) showed that teachers reported significantly more colds annually compared to non-teachers. Teachers have also been found to have laryngitis significantly more often than nonteachers (Roy, Merrill, Thibeault, Parsa, et al., 2004; Sala et al., 2001). Allergies also seem to be a risk factor contributing to voice disorders (Roy, Merrill, Thibeault, Parsa, et al., 2004; Sala, Hytönen, Tupaselä, & Estlander, 1996; Gotaas & Starr, 1993; Spiegel, Hawkshaw, & Sataloff, 1991; Stemple, 1995; Woo, 1996), and special attention should be paid to the treatment of allergies in professional voice users (Jackson-Menaldi, Dzul, & Holland, 1999; Spiegel et al., 1991).

Several authors have mentioned psychological stress as a factor contributing to voice problems among teachers (Gotaas & Starr, 1993; Morton & Watson, 1998; Sapir et al., 1993). The numerous stress factors that have been linked to teachers work include disrespectful behavior of pupils and noise in classrooms caused by misbehaving pupils (Boyle, Borg, Falzon, & Baglioni, 1995; Friedman, 1995; Griffith, Steptoe, & Croypley, 1999; Jacobsson, Pousette, & Thylefors, 2001; Santavirta, Aittola, Niskanen, Pasanen, Tuominen, & Solovieva, 2001). Poor classroom acoustics might also have a negative effect on disciplinary issues, as it might have an impact on the pupils' concentration and thus raise noise levels (Knecht et al., 2002). The attitudes of an undergraduate student population towards teachers with moderate voice disorders have been found to be more negative than attitudes towards teachers without voice disorders (Lallh & Rochet, 2000). This could have a negative effect on the pupils' behavior in the classroom, which, in turn, might increase stress in teachers. Teachers who experience stress may deal with a vicious cycle: stress contributes to voice problems and voice problems contribute to stress. In educational settings communication is based on speech. The results of several studies show that teachers report that their voice problems have a negative effect on their performance at work (Roy, Merrill Thibeault, Gray et al., 2004; Russel et al., 1998; Sapir et al., 1993; Smith et al., 1997; Smith, Lemke et al., 1998).

Methology of Research

In my research I chosed to use two methods as a background methods in my thesises: ABC-method of Ritva Eerola and Pilates-method. Both methods turn out to be the most useful methods for teachers for next reasons: (1) they both use lateral breathing, (2) they use „power house“ thesis, (3) they use special concentration when practising exercises. These reasons will help the teacher to use efficient proprioceptical sensory feedback.

Eerola-Method

The Eerola-method I use in my theses, consists of the ABC-analysis of the function of the singing and speaking voice and and a practical method of establishing balanced function in voice production

Jos haluat, voit nimittää myös the Eerola-balance-method.

This methodology has been developed by FM Ritva Eerola, a voice teacher, voice therapist and speech pathologist and her ABC-analysis method was first presented at the International Congress of Voice Teachers in 1994 in Auckland, Australia (Eerola 2008). Eerola has developed her method for over 40 years in her work at the University of Helsinki and Sibelius-Academy in Finland.

The main theses of Eerola-balance-method are:

- a) to establish a phonation balance on the vocal folds level
- b) to reach this balance by using the energy of expression of the text; particularly concentrating on the vowels of the words and trying to forget -making the sound
- c) to concentrate on timing: (1) excitement on the emotional and expressional level, which tunes the instrument ready for action, (2) the words filled with expression, (3) the voice
- d) The muscles of the human body (from feet to collarbone level) have to take the responsibility of producing energy
- e) The consonants give muscular strength to the voice by will power. Their energy must be sensed underneath the waist area, on the pelvic level
- f) The paradigms must be programmed to serve the right directions of the vocal production activity:
 - a heavy downwards feeling should be felt underneath the waist area. At the same time there must be a reverse -ricochet feeling up along the spine to the base of the skull. As a result of this reverse dimensional stretching the chest area arises.
- g) As a result of ditto there will be compounded a wide triangle model (1) from the hips up to the base of the skull (2) from the base of the skull to the sternum, and (3) from the sternum back to the hips.
- h) The energy of text expression stays inside this triangle model area
- i) The phonation must be sensed to start with delay, a fraction of second later than starting the energy of the text with expression power
- j) The voice must be sensed staying outside of this triangle model of body.

Pilates- method

The other main method I use among a collection of resources that should be considered in working with the primary prevention of voice disorders and giving new models of vocal hygiene exercises, is Pilates-method. Pilates is a physical fitness system developed in the early 20th century by Joseph Pilates in Germany. In 2005 there are 11 million people who practice the discipline regularly and 14,000 instructors in the United States. Pilates called his method Contrology (from control and Greek -λογία, -logia), because he believed his method uses the mind to control the muscles. The program focuses on the core postural muscles which help keep the body balanced and which are essential to providing support for the spine. In particular, Pilates exercises teach awareness of breath and alignment of the spine, and aim to strengthen the deep torso muscles. Pilates method incorporates both physical and mental elements and helps to find, experience and use deeper and inner muscles of body we need to support our posture and breathing. The technique focuses on the “power house” or what is known today as the core; in Pilates, this includes the abdominal, gluteal, and paraspinal muscles in particular. The goals are to increase muscle strength and endurance as well as flexibility and to improve posture and balance. The mental element of Pilates is evident in the additional focus on breathing and concentration during the execution of these exercises (Sorosky, Stilp, Akuthota 2007). There has been researches about Pilates-exercises and the effect of Pilates exercises on muscle activity, flexibility, body composition, and muscular strength were well defined (Segal et al 2004, Herrington ad Davies 2005, Petrofsky et al 2005). These results show promise for future large-scale studies in Pilates training. Despite the hundreds

of published articles on Pilates, the extant scientific evidence for Pilates is limited (Bernardo 2007). The „power house“ in Pilates-method helps to find proprioceptive sensory feedback experiences, which is very important to understand and work with Eerola-exercises. It will also teach the speaker to achieve better concentration in working with body movements. Because Pilates-method is using the same lateral breathing as Eerola-method, they support themselves also in this area. In Eerola-exercises we have to use our deeper muscles and parts of body, which are not consciously used in everyday life (e.g. spine muscles, chest (sternum) muscles, pelvic floor and inner lateral abdominal muscles). This is also a reason, why using Pilates-method it helps us to find the sensomotoric way to these muscles.

Other considerable methodologies to use in this area are Catherine Ftzmaurice's Voicework or *Destructing/Restructing*, the Alexander-technique, the Feldenkreis Method and Method Putkisto. Ftzmaurice's *Destructing/Restructing-method's* approach to breath work is particularly applicable to both singing and speaking voice. In addition, it integrates many other perspectives of voice and movement. *Destructing/Restructing* is about letting go of habitual breathing patterns and reconnecting consciously with the autonomic nervous system.

The Alexander Technique is a technique of body re-education and coordination, accomplished through physical and psychological principles. The technique focuses on the self-perception of body use and is promoted for the alleviation of back pain, rehabilitation after accidents, improving breathing, playing musical instruments and singing. The technique takes its name from F. Matthias Alexander, who first formulated its principles between 1890 and 1900. Alexander developed the Technique as a personal tool to alleviate pain and hoarseness that affected his ability to pursue a career as a Shakespearean actor. Alexander taught his technique for 30 years before creating a school to form other teachers of the technique. All current Alexander Technique teachers have participated in the 3-year, 1600-hour training, all with a pedagogical ancestry traced to Alexander himself. The technique is taught in lessons, through a combination of hands-on coaching and verbal explanation. During lessons, which may last from 30 minutes to an hour, students, guided by the teacher, inhibit habitual reactions and instead find newer and more efficient ways to perform simple tasks, like walking, standing, and sitting. Historically taught in private lessons, its principles have also been adapted to be taught in groups, often using short individual lessons which, in turn, act as examples to the rest of the class.

The Feldenkrais Method is an educational system centered on movement, aiming to expand and refine the use of the self through awareness. It is intended for those who wish to improve their movement repertoire (dancers, musicians, artists), as well as those wishing to reduce pain or limitations in movement, and many who want to improve their general well-being and personal development. Because it uses movement as the primary vehicle for gaining awareness, it is directly applicable to disorders that arise from restricted or habitually poor movement. But as a process for gaining awareness, the system claims to expand a person's choices and responses to many aspects of life: emotions, relationships, and intellectual tasks; and it applies at any level, from severe disorder to highly professional performance. The Feldenkrais Method holds that there is no separation between mind and body, and thus learning to move better can improve one's overall well-being on many levels.

Method Putkisto is an innovative, precise exercise method of deep-stretching, deep-strengthening and deep-breathing, enabling speaker to achieve in-depth improvements in the body shape for a leaner, trimmer body - lifting speaker also to a good posture. The focus is on stretching and elongating the deep postural muscles. The method highlights the fact that muscle tightness and shortness is the primary problem in all body work. Stretching these tight, short muscles will realign and ultimately reshape the body. Most importantly Method Putkisto teaches the speaker the very basic skills of fitness: stretching, strengthening the core muscles of the body and a good breathing technique.

Results of Research

New models of vocal hygiene strategies

The aim of the article is to elaborate the socially conditional model of teacher's speech, especially from a practical aspect. It is based on review articles of sociolinguistic theories, factors of voice disorders in teachers and on new theories of functional voice disorders, especially the Eerola-method and the Pilates-method.

In classroom teaching, teachers' ineffective speaking habits affect the audience in many ways.

To begin with,

a) when a teacher is pressing her larynx downwards while speaking, the listeners may feel pain in their throats. This is one of the many ways listeners are influenced by teachers, because they automatically empathize with the vocal function in their own body. In Eerola-exercises the basic energy of voice must be sensed underneath the waist area, on the level of pelvis. As a result, speakers' larynx remains free.

b) A teachers' speaking model may be picked up by listeners' unconscious mind as an example for future; thus, a teachers' voice can affect listeners psychophysically. When the voice balance stays on the vocal folds level, as in Eerola-exercises, the voice example given to listeners is also more balanced.

c) When a teacher is speaking with an unnecessarily loud or silent voice, listeners may feel unhappy and uncomfortable as a result of being emotionally influenced by the teacher's voice. When the energy of text expression stays in this triangle model area while speaking, the decibels of teachers' voice will most usually stay in normal area

d) When the audience concentrates more on vocal quality than on the intended message, the whole message can be changed or understood differently than intended. Audience members may also lose their interest and willingness to understand what the teacher is saying. The practice of Eerola-exercises are done before the classroom situations to build a new muscle memory in our cells. In speaking situation, when using energy of expression of the text, also the expression and the understanding of the message will be more clear.

These were four (4) situations, where Eerola-exercises can be used effectively. All in all, teachers' speaking habits affect Tutkimusten mukaan jopa 38% the audience much more than teachers commonly realize. Therefore, some changes in teachers' voice lessons on college level teacher training should be considered.

Also the latest psychophysical and acoustical research brings new extensive knowledge to teachers' voice training. From this base the next 4 vocal hygiene models for teachers could be initiated :

a) Lateral breathing. When a teacher uses lateral breathing while speaking, the diaphragm has more space to descend. While the diaphragm is moving downwards, also the larynx moves downwards (tracheal pull), so the throat can be relaxed at the same time. As a result, teachers can speak longer phrases and for a longer time without feeling vocally tired.

b) Support of the voice. When we are using our pelvic floor muscles to support our voice production, the whole pelvic area is working as a support (a term of singing pedagogy), and the throat is relaxed, giving us the opportunity to release both the tension in the vocal folds and increase the sound quality of the voice.

c) Head and chest resonance. When using both head and chest resonance we make a more balanced and full-bodied voice, because chest resonance adds vocal richness and fullness and head resonance brings more clarity to our voice. They both are needed for an even and balanced voice production.

d) Proprioceptical sensory feedback experiences. In our voice production we are usually used in listening to the sound of our voice while speaking. That habit makes our larynx to follow every step of our intonation, but the natural role of the larynx is to remain to be free. When we

are using our proprioceptical sensory feedback experiences instead of only listening and trusting acoustical information, the larynx will be able to work more freely. Thus also the sound of the voice will become more free.

As a result, the traditional teaching methods of teachers' voice training can benefit from updating the latest psychophysical and acoustical researches.

Conclusions

Voice disorders are very typical and are mostly connected to external factors such as environmental factors associated with vocal loading, health-related factors and stress-related factors. The primary prevention of voice disorders must consist of teaching vocal hygiene strategies, while secondary prevention involves early detection and treatment of voice disorders. The basic information of vocal hygiene will change teachers' attitude towards their voice in field condition and also to the educational role of teachers' voice and performance. There has not yet been studied how voice disorders are connected to speakers' posture, use of resonance and registers and therefore more researches are needed in this area. Although, this study shows that Eerola-exercises and Pilates-exercises, which are both helping us to find, experience and use deeper and inner muscles of body we need to support our posture and breathing, are helping us find new approaches to solve vocal problems and disorders among teacher students and teachers.

These methods and exercises can give us a new basis of vocal hygiene strategies. These models of such training can be incorporated for all teachers, for example, in Tallinn University.

Because recent researches in Estonia have noticed that most students discern school climate and therefore also climate of the lesson as cold and usually boresome and don't have confidence in teacher or perceives, it is most important to take care of teachers' voice basis immediately. Teachers' speaking habits affect the audience much more than teachers commonly realize. Therefore, some changes in teachers' voice training in universities and colleges should be considered. These teaching methods of teachers' voice training can also make use of updating to latest psychophysical and acoustical researches.

References

- Alexander B.K., Anderson G., L., Gallegos, B. P. (ed-s) 2004. *Performance Theories in Education: Power, Pedagogy, and the Politics of Identity*. Routledge
- Bernardo, L. (2007). The effectiveness of Pilates training in healthy adults: An appraisal of the research literature. *Journal of Bodywork and Movement Therapies*, 11, 106-110
- Boyle, G.J., Borg, M.G., Falzon, J.M., & Baglioni Jr., A.J. (1995). A structural model of the dimensions of teacher stress. *British Journal of Educational Psychology*, 65, 49-67.
- Coyle, S.M., Weinrich, B.D., & Stemple, J.C. (2001). Shifts in relative prevalence of laryngeal pathology in a treatment-seeking population. *Journal of Voice*, 15, 424-440.
- Crandell, C., & Smaldino, J. (2000). Classroom acoustics for children with normal hearing and with hearing impairment. *Language, Speech, and Hearing Services in Schools*, 31, 362-370.
- Damasio, A. (1994). *Descartes' error*. New York: Grosset/Putnam.
- Friedman, I. A. (1995). Student behavior patterns contributing to teacher burnout. *The Journal of Educational Research*, 88, 281-289.
- Goleman, D., Boyatzis, R., McGee, A. (2003). *Loomulik juhtimine emotsionaalse intelligentsuse jõuga* [Natural leadership with the energy of emotional intelligence] Tallinn: Väike Vanker, 309 lk.
- Gotaas, C., & Starr C.D. (1993). Vocal fatigue among teachers. *Folia Phoniatica et Logopaedica*, 45, 120-129.

- Griffith, J., Steptoe, A., & Cropley, M. (1999). An investigation of coping strategies associated with job stress in teachers. *British Journal of Educational Psychology*, 69, 517-531.
- Hemler, R.J., Wieneke, G.H., & Dejonckere, P.H. (1997). The effect of relative humidity of inhaled air on acoustic parameters of voice in normal subjects. *Journal of Voice*, 11, 295-300.
- Herrington, L., Davies, R., 2005. The influence of Pilates training on the ability to contract the transversus abdominis muscle in asymptomatic individuals. *Journal of Bodywork and Movement Therapies*, 9, 52-57.
- Hertegård S. (1988). Voice problems in a small Swedish town: a retrospective study of the prevalence and a follow up. *Journal of Voice*, 1, 336-340.
- Jackson-Menaldi, C.A., Dzul, A.I., & Holland, R.W. (1999). Allergies and vocal fold edema: a preliminary report. *Journal of Voice*, 13, 113-122.
- Jacobsson, C., Pousette, A., & Thylefors, I. (2001). Managing stress and feelings of mastery among Swedish comprehensive school teachers. *Educational Research*, 45, 37-53.
- Kitayama, S., Markus H.R. (1994). Introduction to cultural psychology and emotion research. In S.Kitayama, H.R.Markus (Eds.), *Emotion and culture: Empirical Studies of Mutual Influence*. Washington DC:American Psychological Association, 1-19
- Knecht, H.A., Nelson P.B., Whitelaw, G.M., & Feth, L.L. (2002). Background noise levels and reverberation times in unoccupied classrooms: Predictions and measurements. *American Journal of Audiology*, 11, 65-71.
- Lallh, A.K., & Rochet, A.P. (2000). The effect of information on listeners' attitudes toward speakers with voice or resonance disorders. *Journal of Speech, Language and Hearing Research*, 43, 782-95.
- Morton, V., & Watson, D.R. (1998). The teaching voice: problems and perceptions. *Logopedics, Phoniatrics, Vocology*, 23, 133-139.
- Nelson, P. B., & Soli, S. (2000). Acoustical barriers to learning: Children at risk in every classroom. *Language, Speech, and Hearing Services in Schools*, 31, 356-361.
- Ohlsson, A-C., Järholm, B., & Löfqvist, A. (1987). Vocal symptoms and vocal behaviour in teachers. *Nordisk tidskrift for Logopedi og Foniatri*, 12, 61-69.
- Pekkarinen, E., & Viljanen, V. (1991). Acoustic conditions for speech communication in classrooms. *Scandinavian Audiology*, 20, 257-63.
- Pekkarinen, E., Himberg, L., & Pentti, J. (1992). Prevalence of vocal symptoms among teachers compared with nurses: A questionnaire study. *Scandinavian Journal of Logopedics and Phoniatrics*, 17, 113-117.
- Petrofsky, J., Morris, A., Bonacci, J., Hanson, A., Jorritsma, R., Hill, J., (2005). Muscle use during exercise: a comparison of conventional weight equipment to Pilates with and without a resistive exercise device. *The Journal of Applied Research*, 5 (1), 160-173.
- Pineau, E. L. (1994). Teaching is performance: Reconfiguring a problematic metaphor. *American Educational Research Journal*, 31(1), 3-25.
- Rantala, L., Paavola, L., Körkkö, P., & Vilkmán, E. (1998). Working-day effects on the spectral characteristics of teaching voice. *Folia Phoniatria et Logopaedica*, 50, 205-211.
- Rantala, L., & Vilkmán, E. (1999). Relationship between subjective voice complaints and acoustic parameters in female teachers' voices. *Journal of Voice*, 13, 484-495.
- Rantala, L., Vilkmán, E., & Bloigu, R. (2002). Voice changes during work: Subjective complaints and objective measurements for female primary and secondary schoolteachers. *Journal of Voice*, 16, 344-355.
- Roy, N., Merrill, R.M., Thibeault, S., Parsa, R.A., Gray, S.D., & Smith, E.M. (2004). Prevalence of voice disorders in teachers and the general population. *Journal of Speech, Language, and Hearing Research*, 47, 281-293.
- Russell, A., Oates, J., & Greenwood, K.M. (1998). Prevalence of voice problems in teachers. *Journal of Voice*, 12, 467-479.

- Ruus, V. & Veisson, M. (2007). Õpilaste edukus, toimetulek ja heaolu koolis. In: T. Kuurme (Ed) *Kool kui arengukeskkond ja õpilase toimetulek* [School as developmental environment and students' copying]. Tallinn: TLÜ Kirjastus. 17-58.
- Sala, E., Hytönen, M., Tupaselä, O., & Estlander, T. (1996). Occupational laryngitis with immediate allergic or immediate type specific chemical hypersensitivity. *Clinical Otolaryngology and Allied Sciences*, 21, 42-48.
- Sala, E., Laine, A., Simberg, S., Pentti, J., & Suonpää, J. (2001). The prevalence of voice disorders among day care center teachers compared with nurses: A questionnaire and clinical study. *Journal of Voice*, 15, 413-423.
- Santavirta, N., Aittola, E., Niskanen, P., Pasanen, I., Tuominen, K., & Solovieva, S. (2001). *Enough is enough. A research report of the work environment, job satisfaction and burnout of Finnish primary, secondary and high school teachers*. Department of Education, University of Helsinki.
- Sapienza, C.M., Crandell, C.C., & Curtis, C. (1999). Effects of sound-field amplification on reducing teacher's sound pressure level in the classroom. *Journal of Voice*, 13, 375-381.
- Sapir, S., Keidar, A., & Mathers-Smith, B. (1993). Vocal attrition in teachers: Survey findings. *European Journal of Disorders of Communication*, 28, 177-185.
- Soninen, A. (1970). Phoniatic viewpoints on hoarseness. *Acta Otolaryngologica*, 263, 68-81.
- Segal, N., Hein, J., Basford, J., (2004). The effects of Pilates training on flexibility and body composition: an observational study. *Archives of Physical Medicine and Rehabilitation*, 85, 1977-1981.
- Slobodan, T.J., Zorka, K., Miodrag, D., Mirjana, R. (2004). *Serbian emotional speech database*. SPECOM'2004 9th Conference Speech and Computer, St.Petersburg, Russia.
- Smith, E., Gray, S.D., Dove, H., Kirchner, L., & Heras H. (1997). Frequency and effects of teachers' voice problems. *Journal of Voice*, 11, 81-87.
- Smith, E., Kirchner, H.L., Taylor, M., Hoffman, H., & Lemke J.H. (1998). Voice problems among teachers: Differences by gender and teaching characteristics. *Journal of Voice*, 12, 328-334
- Sorosky, S., Stilp, S., Akuthota, V. (2008). Yoga and pilates in the management of low back pain. *Curr Rev Musculoskelet Med*, 1:39-47
- Stemple, J. (1995). *Clinical voice pathology. Theory and management*. San Diego, California: Singular Publishing Group.
- Spiegel, J.R., Hawkshaw, M., & Sataloff, R.T. (1991). *Allergy*. In: R. T. Sataloff (Ed.), *Professional voice: The science and art of clinical care* (pp. 153-157). New York: Raven Press.
- Södersten, M., Granqvist, S., Hammarberg, B., & Szabo, A. (2002). Vocal behavior and vocal loading factors for preschool teachers at work studied with binaural DAT recordings. *Journal of Voice*, 16, 356-371.
- Tilk, M. (1999). *Keelemaagiast*. [The magic of the language] Artikleid ja arhivaale. **Keeleuenduslik kirjastik**. J. Aaviku Selts.
- Toivanen, J., Väyrynen, E., Seppänen, T. (2004). Automatic discrimination of emotion from spoken Finnish. *Language and Speech*, 47 (4) 383-412.
- Verdolini, K., Titze, I.R., & Fennell, A. (1994). Dependence of phonatory effort on hydration level. *Journal of Speech, Language, and Hearing Research*, 37, 1001-1007.
- Vilkman, E. (1996). Occupational risk factors and voice disorders. *Logopedics, Phoniatrics, Vocology*, 21, 137-141.
- Vilkman, E. (2000). Voice problems at work: A challenge for occupational safety and health arrangement. *Folia Phoniatica et Logopaedica*, 52, 120-125.
- Vilkman, E. (2004). Occupational safety and health aspects of voice and speech professions. *Folia Phoniatica et Logopaedica*, 56, 220-253.

- Vilkman, E., Lauri, E-R., Alku, P., Sala, E., & Sihvo, M. (1997). Loading changes in time-based parameters of glottal flow waveforms in different ergonomic conditions. *Folia Phoniatica et Logopaedica*, 49, 247-263.
- Vilkman, E., Lauri, E-R., Alku, P., Sala, E., & Sihvo, M. (1998). Ergonomic conditions and voice. *Logopedics, Phoniatics, Vocology*, 23, 11-19.
- Vintturi, J., Alku, P., Sala, E., Sihvo, M., & Vilkman, E. (2003). Loading-related subjective symptoms during a vocal loading test with special reference to gender and some ergonomic factors. *Folia Phoniatica et Logopaedica*, 55, 55-69.
- Woo, P. (1996). The irritated larynx: Edema and inflammation. In S. Brown, B. Vinson, & M. Crary (Eds.), *Organic voice disorders: Assessment and treatment* (pp. 193–218). San Diego, London: Singular Publishing Group.

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