How to Use Good Vocal Behaviors in the Classroom:  
An Instructional Videotape

by
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Cohort 5

An Applied Dissertation Presented to the  
Programs in Speech-Language and Communication Disorders  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Speech-Language Pathology

Nova Southeastern University  
2002
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Approval Page

This applied dissertation was submitted by Susan Berlinger-Schwartz under the direction of the persons listed below. It was submitted to the Programs in Speech-Language and Communication Disorders and approved in partial fulfillment of the requirements for the degree of Doctor of Speech-Language Pathology at Nova Southeastern University.

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Acknowledgment

I wish to applaud my husband, Joel, who has provided unconditional support, understanding, and commitment throughout the entire doctoral program. I offer sincere thanks to Fritzi and Ivan Schwartz, who were instrumental in promoting my educational advancement and without their support I could not have achieved this standing. Thank you, Bill Horneck, for your generosity, time, and expertise provided while producing the instructional videotape for this study and making my vision a reality. Special thanks go to Cathleen Bergin for being an outstanding advisor and esteemed professional. Your commitment, generosity, and support during the applied dissertation process were most valued.
Abstract

How to Use Good Vocal Behaviors in the Classroom: An Instructional Videotape.

It is well documented that professional educators experience vocal problems more than the general population. This applied dissertation was designed to examine the existence of vocal problems among elementary school teachers, kindergarten through fifth grade in Southeast Florida. The goal of this study was to explore how well a professionally designed instructional videotape would increase elementary school teachers’ awareness of vocal misuse, vocal overuse, and prevention in the workplace.

This investigator created and designed a professional instructional videotape to present to elementary school teachers and speech-language pathologists (SLPs). The SLPs served as expert raters to determine if the instructional videotape had value for the elementary school teacher as a preventative vocal hygiene tool. Both elementary school teachers and SLPs qualified for participation in the study by completing a voice needs assessment questionnaire. Following qualification, the SLPs viewed the instructional videotape and completed a voice postquestionnaire. The elementary school teachers completed a voice prequestionnaire, viewed the instructional videotape, and completed a voice postquestionnaire.

An analysis of the data revealed that this instructional videotape was an effective means of increasing teacher awareness about voice misuse and voice overuse and that vocal prevention was available. In addition, SLPs found that elementary school teachers benefited from the instructional videotape as a vocal preventative measure.
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Chapter 1: Introduction

_Description of Community_

This applied dissertation was conducted in a large urban school district in the Southeastern part of the United States. South Florida's Regional Council (2001) reported that the southeastern region of Florida is known for its parks, recreation, tourism, award-winning beaches, pristine wilderness, and citrus industry. Southeastern Florida is a magnet for people from around the world who make this their winter residence, and it is a mecca for retirees. The Florida Department of Community Affairs (1997) reported that Southeastern Florida is also known for its hydrological system, natural and man-made, which includes Lake Okeechobee, the Everglades, many lakes, canals and levees, and five water conservation areas. Miami is known as the gateway for Latin Americans, giving South Florida an international flavor.

The U.S. Census Bureau (2001) reported the population of the sponsoring county at 1,623,018 residents, and it is projected to be 1,949,400 residents by 2010. The racial diversity of this county includes 1,145,287 Caucasians, 333,304 African Americans, 3,867 Native Americans, 36,581 Asians, 916 Native Hawaiians and other Pacific Islanders, and 271,652 Hispanics. This county consists of 30 cities and is known to be one of the largest in the nation.

_Writer's Work Setting_

This study was conducted in the public school district of the county. This county is one of the fastest growing school districts nationwide with a unique combination of urban and suburban students. It is the nation's largest fully accredited school district. Currently this district has an unprecedented growth of approximately 6,000-10,000 new students, kindergarten through twelfth grade, per year. The racial breakdown of students includes
38.5% Caucasians, 35.8% African Americans, 20.8% Hispanics, 2.9% Asians, 0.3% Native Americans, and 1.7% multi-racial students. Over 152 countries and 52 language groups are represented in this district; language groups from most frequently represented to least represented are English, Spanish, Haitian Creole, Portuguese, French, Chinese, Urdu, Arabic, Vietnamese, and Korean.

There are a total of 224 schools, 128 of which are elementary schools. There are approximately 6,525 kindergarten through fifth grade elementary school teachers in this county’s public school district. Elementary school teachers were chosen to participate in this study because research reports that this population is at risk for vocal overuse and vocal misuse. The average elementary school teacher’s work experience in this county is 13.05 years and about 45% hold advanced degrees. The racial breakdown of elementary school teachers includes 70.5% Caucasians, 20.3% African American, 8.0% Hispanic, 0.7% Asian, 0.4% Native American, and 0.1% unknown.

There are approximately 300 Speech and Language Pathologists (SLPs) in this county’s public school district. SLPs were chosen to participate in this study because they are qualified to identify individuals having voice concerns. The average SLP’s work experience is 13.2 years and 46.5% hold advanced degrees. The racial breakdown of SLPs includes 86.8% Caucasians, 8.9% African American, 3.3% Hispanic, 0.6% Native American, 0.2% Asian, and 0.2% unknown.

**Writer’s Role**

This writer’s role was to serve as an SLP who is conducting and overseeing this study which was designed for implementation in elementary classrooms, kindergarten through fifth grade, in this county’s public school district. The writer complied with all specifications for conducting research, as established by Nova Southeastern University.
and by the county’s public school district. An Institutional Review Board (IRB) application was completed and submitted to the IRB to gain approval for the use of human subjects. The county public school’s application for conducting research was completed and submitted to the Department of Research and Evaluation.

Step 1 consisted of creating and disseminating a letter that was sent to select principals at this county’s public school district. By describing the applied dissertation, it was intended that this letter would generate interest for volunteer participants in this study (see Appendix A for principal letter). Step 2 consisted of creating and disseminating a voice needs assessment questionnaire to elementary school teachers and SLPs (see Appendixes B and C for elementary school teacher and SLP voice needs assessment questionnaires). The purpose of the first questionnaire was to ascertain whether elementary school teachers in Southeastern Florida had vocal problems or vocal concerns and if they would benefit from a preventative instructional videotape. The purpose of the other questionnaire was to ascertain whether SLPs in Southeastern Florida displayed competency in the identification, evaluation, and treatment of voice disorders and if so, determine if an instructional videotape would increase awareness of vocal misuse and vocal overuse among teachers. The purpose of this portion of the study was to select participants from kindergarten through fifth grade classroom teachers and from school district SLPs who qualified for participation and consented to take part in this study.

Step 3 consisted of this writer taking a leadership role by creating the script for the instructional videotape, auditioning actors/actresses, producing the instructional videotape, designing the instructional videotape insert describing its contents, and evaluating the finished product (see Appendix D for instructional videotape script and
Appendix E for instructional videotape insert). Step 4 consisted of the creation of a voice prequestionnaire and postquestionnaire for elementary school teachers, the compilation of statistics for analysis of teachers' data, the creation of the voice postquestionnaire for SLPs, and the compilation of statistics for analysis of SLPs' data (see Appendixes F, G, and H for elementary school teacher voice prequestionnaire, postquestionnaire, and SLP voice postquestionnaire). Step 5 consisted of the writing and the revision of Chapters 1-4 including tables and references. Step 6 consisted of having the elementary school teachers sign a consent form to participate in this study (see Appendix I for elementary school teachers consent form for participation). Step 7 consisted of having the elementary school teachers complete the voice prequestionnaire prior to viewing the instructional videotape. Step 8 consisted of the viewing of the instructional videotape by the teachers. Step 9 consisted of the completion of the elementary school teachers’ voice postquestionnaire by the elementary school teachers and the analysis and interpretation of the statistical data. Step 10 consisted of having the SLPs sign a consent form to participate in this study (see Appendix J for SLPs consent form for participation). Step 11 consisted of the SLPs viewing of the instructional videotape. A voice prequestionnaire was not given to the SLPs as was done with the elementary school teachers because the SLPs were only participating in this study as expert-raters. Expert-rater status was obtained by the SLPs completing a needs assessment questionnaire that provided the investigator with the SLPs background and experience. Only those having a master's degree, one or more years of experience as an SLP, and a self-rating of "satisfactory" or above in the area of identification of voice problems, evaluation, and treatment were chosen to participate in this study on a voluntary basis. Step 12 consisted of the completion of the SLP voice postquestionnaire by the SLPs and the analysis and
interpretation of the statistical data. Step 13 consisted of the writing and the revision of Chapter 5, statistical analysis, and references.
Chapter 2: Study of the Problem

*Problem Statement*

This applied dissertation examined the existence of vocal problems among elementary school teachers, kindergarten through fifth grade, in Southeast Florida and the elements in the elementary school educational setting which contributed to such problems. As professionals trained to assess vocal problems, SLPs provided feedback regarding the merits of an instructional videotape as a preventative tool.

*Problem Description*

Many researchers found that professional educators experience vocal pathologies more than the general population (Mattiske, Oates & Greenwood, 1998; Russell, Oates & Greenwood, 1998; Sala, Laine, Simberg, Pentti & Suonpää, (2000); Sapir, Atias & Shahar, 1990; Smith, Lemke, Taylor, Lester-Kirchner & Hoffman, 1998; Vilkman, 2000). Vocal misuse is evident in a variety of teachers (e.g., elementary, high school, university, exercise instructors, or other instructional disciplines) often placing them at high risk for vocal problems (Gotaas & Starr, 1993; Miller & Verdolini, 1995; Smith, Lemke et al., 1998). Mattiske et al. (1998) reported that voice problems are an occupational hazard within the teaching profession. The current problem and the real issue is that elementary school teachers are more susceptible to vocal misuse and vocal overuse than the general population because they use their voices more frequently in a variety of class sizes and groups during the workday. Teachers provide constant instruction for their students all day. Teachers often monitor students during lunchroom, hall, playground, and bus duties. These extra duty assignments require teachers to elevate their vocal intensity in loud environments so they can be heard, further straining the voice. Frequent talking, elevating vocal intensity, or yelling are factors that
contribute to vocal misuse and vocal overuse. Some teachers complain of frequent
coughing, frequent throat clearing, throat pain, difficulty raising vocal intensity and/or
varying pitch. Although much of the literature discusses both elementary and high school
teachers as groups of high vocal users, there is little research which solely addresses
elementary school teachers as a whole.

Problem Documentation

Test scores, staff reports, interview results, questionnaire responses, or observations
were not available to provide evidence that there was vocal misuse or vocal overuse
among elementary school teachers in Southeast Florida. Therefore as part of this study,
two voice needs assessment questionnaires were created by this investigator and
disseminated to elementary school teachers and SLPs to fill this void.

The first voice needs assessment questionnaire was developed for elementary
school teachers in this county’s public school district. The purpose of this questionnaire
was to ascertain whether elementary school teachers in Southeastern Florida were
aware that vocal problems existed, some of the causes of these problems, and whether a
preventative instructional videotape was beneficial. The second voice needs assessment
questionnaire was developed for SLPs in this county’s public school district. The purpose
of this questionnaire was to ascertain whether a preventative instructional videotape
would increase awareness of vocal misuse and vocal overuse among elementary teachers
and to determine whether the preventative instructional videotape would be of value.

Causative Analysis

An extensive literature search, this writer’s clinical experience, and informal
interviews with teachers pinpointed various causes of vocal misuse and vocal overuse
among teachers. Causes of vocal misuse and vocal overuse among teachers include noise,
classroom environment, excessive talking, contaminants, environmental influences, medical history, and emotional state.

*Classroom noise and classroom acoustics.* Noise in the classroom affects how teachers modulate their voices in classroom settings, potentially causing faulty use of the vocal mechanism. There is less research specifically addressing how noise in the classroom affects the teacher's voice; however, there is an abundant amount of research specifically targeting how poor classroom acoustics can affect psychoeducational development and psychosocial development of both children with hearing loss as well as children with normal hearing (American Speech-Language-Hearing Association [ASHA], 1995; ASHA, 2001; McCrea, 1996; Sliwinska-Kowalska, Fiszer, Niebudek-Bogusz, Kotylo & Rzadzinska, 2000). Solutions for poor classroom acoustics and guidelines for improving them are offered in the literature (Acoustical Society of America [ASA], 2000). The ASA has designed guidelines for a typical classroom of approximately 30 students where the teacher instructed the students from the front of the classroom. These guidelines included establishing appropriate reverberation time, reducing undesirable reflections (e.g., echoing), maintaining desirable reflections (e.g., teacher's voice), reducing mechanical equipment noise, identifying interior and exterior noise sources, and developing sound reinforcement. Creating learning environments with desirable listening conditions can help not only the student with or without disabilities to better hear and learn, but it can also help the teacher place less strain on the voice when teaching in the classroom (ASA, 2000; ASHA, 1995; ASHA, 2001; Sliwinska-Kowalska, et al., 2000; Smaldino & Crandell, 1999).

Crandell & Smaldino (1999) stated that background noise could come from external sources, internal sources or both. Kennedy (2000) found that "studies
of elementary and secondary school classrooms revealed that excessive background noise, which competes with the speech of teachers, aides, classmates, and audio educational media, is common even in new classrooms” (p. 12). Excessive noise levels and reverberation are well documented in studies addressing acoustical conditions in the classroom environment (Crandell, 1993; Crandell & Bess, 1986; Finitzo-Hieber, 1988). Finitzo-Hieber (1988) described noise as an auditory disturbance that gets in the way with what the listener desires to hear. Furthermore, “for a teacher who is transmitting information all day long, the experience may be fatiguing” (Finitzo-Hieber, 1988, p. 221). Kryter (1996) defined noise as an “audible acoustic energy (sound) that is unwanted because it has adverse auditory and non-auditory physiological or psychological effects on people” (p. 1).

Anderson (2001) found that when “noise leaks in from outside the classroom, teachers must raise their voices to be heard, and their voices can become strained.... Noisy ventilation systems that cycle on and off, poor insulation between classrooms that allows sound leakage, hard surfaces that reflect noise, and such outside noise sources as traffic and airplanes can cause teachers to strain their voices” (p. 77). Anderson further reported that classroom noise affected behavior. Factors such as attention span, focused listening, and proper classroom behavior are compromised by classroom noise. Teachers must not only raise their voices to be heard, but also must frequently repeat instruction. The classroom stress level becomes elevated and teacher effectiveness may be reduced when teachers must increase their vocal volume so the lesson can be heard.

Noise in the classroom and class size may have an effect on how teachers modulate their voices. The U.S. General Accounting Office (1995) reported on the noise levels in our nation’s classrooms. Twenty-eight percent of 10,000 respondents from a school
survey suggest that noise control is the primary environmental problem in schools and called acoustics "the top environmental issue that needed to be addressed in schools" (p. 3). Due to the importance of classroom noise and classroom size, it was essential to review this county's public school district's student-teacher ratio.

This county's public school district's latest figures (1989-99) regarding class size revealed the typical student-teacher ratio was $K = 25:1$; grades 1–3 = 28:1, and grades 4–6 = 32:1. The maximum student-teacher ratio for special education classes was 15:1 (McCrea, 1996). McCrea's (1996) investigation indicated that standards should be established for optimum noise levels in regular classrooms. Standards are being developed for classroom acoustics (American National Standards Institute [ANSI], 2002). Importantly, the American Disability Act (ADA) Access Board (2001) and other groups are currently developing acoustical guidelines for children with hearing disabilities.

It is well documented that environmental noise can hamper daily activities, promote fatigue, and cause irritability. Talking to a class can become more difficult when the speaker needs to elevate one's speaking volume in order to be heard. Voice strain and vocal misuse can occur when speaking over such noise. Poor acoustical classroom environments interfere with effective teacher/student communication.

Environments which contain air conditioning noises, miscellaneous background noises, reverberations, noise from nearby rooms, and noise that is generated from outside the school building from cars, buses, traffic, people talking, and so forth, all impinge upon teachers' voices (ASA, 2000; Pekkarinen & Viljanen, 1990; Pekkarinen & Viljanen, 1991). A review of the scholarly literature revealed that researchers attribute teachers' voice misuse and voice overuse to classrooms having poor acoustics as demonstrated by
reverberation, undesirable reflections, useful reflections, and mechanical noise (ASA, 2000; Crandell, 1993; Crandell & Bess, 1986; Murry & Rosen, 2000; Sala, et al., 2000). Pekkarinen, Himberg, and Pentti (1992) stated that background noise and reverberation affect loudness levels of speech. In their study they surveyed 478 teachers and 95 nurses. Teachers often were more dissatisfied with their loudness levels of speech than were the nurses. Thirty percent of the teachers indicated that loudness level of speech in classrooms was “often, or very often, unacceptable” (p. 115). There was only 7% dissatisfaction reported by the nurses regarding the loudness levels of their patients’ speech.

Bistafa and Bradley (1999) reported that reverberation time and maximum background-noise level in classrooms control speech intelligibility. Since no studies have systematically confirmed the adequacy of different speech intelligibility metrics in the classroom, a comparative study of these components would be of value in establishing reverberation time and classroom noise criteria. Bistafa and Bradley found several principal conclusions from their research. They suggested that “for very quiet classrooms of standard sizes and shapes, 100% speech intelligibility is still possible with a reverberation time of at least 0.4-0.5 s, and this is the recommended range” (p. 874). Furthermore, “the ‘ideal’ and the ‘acceptable’ maximum background-noise levels for classrooms are respectively 25 dB and 20 dB below the voice level at 1 m in front of the talker” (p. 875) and “the ‘ideal’ maximum background-noise level, together with the recommended reverberation time, provides conditions that achieve a classroom signal-to-noise ratio of more than 15 dB” (p. 875).

The ASA (2000) stated that “high ambient noise from mechanical equipment such as noisy heating, ventilation, and air conditioning systems is all too common in existing
schools... and a serious problem for teachers and students” (p. 3). Other noise from inside the classroom includes audiovisual equipment, computers, fish tanks, classroom furniture sliding on uncarpeted floors, papers shuffling, and children talking. Interior noise from hallways and adjacent rooms due to thin lightweight wall materials and exterior noise from street traffic, airplanes, and people talking can disrupt the classroom thereby compromising teachers’ voices. Environmental noise can come through classroom walls and poorly sealed or open windows. Teachers must elevate their voices to compensate for the +10 dB signal-to-noise ratio needed for adequate speech intelligibility (ASA, 2000; Scott, 1999). Poor classroom acoustics may cause teachers to miss work throughout the year as a result of vocal strain and stress (ASA, 2000; Smith, Lemke, et al., 1998).

*Excessive talking.* Teachers use their voices throughout the workday as their primary means of instruction. It is well documented that constant talking can lead to vocal misuse and vocal overuse. In reviewing the scholarly literature, it was apparent that excessive talking contributed to voice problems. Elementary school teachers are typically with their classes for most of the school day, in addition to being responsible for special duties (e.g. cafeteria, playground, bus, etc.). They usually have short breaks from classroom instruction during their scheduled lunchtime and during special class instruction, such as physical education, art, or music. Excessive voice use without proper vocal training often leads to misuse and overuse (Boone, 1991; Comins, 1992; Mattiske et al., 1998). Siebert (1999) studied the prevalence of voice problems among teachers and reported “on average, teachers talk for 6.3 hours during a school day” (p. 4).

Sliwinska-Kowalska et al. (2000) reported that teachers who are new to the profession are not adequately prepared for the increased vocal effort typically associated
with teaching. Simberg, Laine, Sala, and Ronnemaa (2000) studied the prevalence of voice disorders of students who are preparing to become teachers. This study investigated vocal symptomatology of 226 students. Speech-language pathologists conducted perceptual voice assessments and those students who evidenced abnormal vocal quality or multiple vocal symptoms were seen by a laryngologist. The authors found that 20% evidenced 2+ symptoms during the prior year and 19% displayed an organic voice component. This further suggested that students in teacher preparation programs could benefit from vocal training orientation because they are not adequately prepared to modulate their voices in a teaching environment. It is well documented that student teachers and elementary school teachers use their voices throughout the workday for instruction. It would be interesting to examine other settings such as daycare teaching and other academic teaching environments in order to further explore voice use scenarios and common complaints.

Sala et al. (2000) reported that teachers working in daycare centers speak for longer periods of time, more loudly, and without breaks. Sapienza, Crandell, and Curtis (1999) found that teachers with a minimum of three years teaching in an academic setting often complained of vocal fatigue and hoarseness. These symptoms or voice problems may be due to teachers talking throughout the day and teachers using elevated loudness levels during instruction. Gotaas and Starr (1993) found that 80% of teachers displayed vocal fatigue as compared to only 5% of the general population. Their results revealed that talking for extended periods of time in the classroom and elevating loudness levels are associated with voice problems. Russell et al. (1998) studied the prevalence of voice problems in teachers via the use of a mail survey. They investigated the self-reported voice problems of 876 teachers in preschool through grade twelve. Three factors were
included in the survey: voice problems on the day of the survey, voice problems for the current teaching year, and voice problems during one's career. The results of this study indicated that 16% of the subjects identified voice problems on the day of the survey, 20% of the subjects reported voice problems during the current teaching year, and 19% of the subjects identified some voice problems throughout their career. Females were two times more likely to report voice problems than males. Further investigation regarding the causes of voice problems among teachers is necessary. The development of a vocal prevention program is recommended as a way to alleviate voice problems for teachers, thereby, helping them learn how to best use their voices in a variety of instructional settings. Health contaminants in the classroom and environmental influences that contribute to voice problems in teachers must also be examined in instructional settings.

*Health contaminants in the classroom.* Allergens, asthma, and sinus infections may also contribute to vocal irritation. Classroom contaminants may subject teachers to more respiratory problems which may also affect their voices. A review of the scholarly literature substantiates how contaminants in the classroom can affect the voice (Mattiske et al., 1998; Murry & Rosen, 2000; Smedje, Norbäck & Edling, 1997). Gotaas and Starr (1993) reported that teachers who experienced vocal fatigue displayed increased occurrences of allergies, hearing problems, and swallowing difficulties. Murry and Rosen (2000) stated that nasal drainage of secretions from allergies and sinus infections can contribute to vocal irritation. Furthermore, the common cold, often transmitted by students, can cause vocal hoarseness or raspiness due to vocal cord swelling. Smedje and Norbäck (2001) reported that school environments could contribute to asthmatic symptoms. They found that there was a higher incidence of asthma in schools that had large rooms, reduced temperature, open shelving, elevated humidity, increased
concentration of formaldehyde or other volatile organic compounds, molds and bacteria, or cat allergens in settled dust (Smedje et al., 1997). Teachers may have a propensity toward developing respiratory ailments because of contaminants in the classrooms and extended voice use.

*Environmental influences.* Environmental influences (e.g., too little or too much humidity, poor air quality, hazardous by-products of furnishings and construction) can contribute to vocal problems. A review of the scholarly literature pinpointed how the environment negatively affected the voice (Norbäck & Edling, 1991; Norbäck, Torgen & Edling, 1990; Nordström, Norbäck & Akselsson, 1995; Smedje et al., 1997; Smith, Lemke et al., 1998; United States Environmental Protection Agency [USEPA], 2002; Walinder, Norbäck, Wieslander, Smedje & Erwall, 1997; Wieslander, Norbäck, Björnsson, Janson & Boman, 1997). There was an increased incidence of volatile hydrocarbons (VOC) at high room temperatures containing respirable dust and high air humidity. Wieslander et al. (1997) studied the significance of emission of formaldehyde and VOCs associated with newly painted surfaces. There were 3,600 screening-type questionnaires mailed to men and women who were 20-44 years of age in a Swedish urban community. All symptomatic respondents (n = 216) and an additional 800 randomly selected subjects participated in this study. Wieslander et al. concluded that

Exposure to chemical emissions from indoor paint is related to asthma, and that some VOCs may cause inflammatory reactions in the airways. Our study suggests that the contribution of emissions from paint to indoor concentrations of formaldehyde and VOCs should be as low as possible. (p. 115)

The USEPA (2002) investigated "sick building syndrome" (SBS). This syndrome is designated when "building occupants experience acute health and comfort effects that
appear to be linked to time spent in a building, but no specific illness or cause can be identified" (p. 1). SBS was related to VOCs in rooms having wall-to-wall carpeting, hyperreactivity, and psychosocial factors. High VOCs are good predictors of chronic symptoms. Further study is needed to modify indoor environments to avoid SBS, such as making improvements to the heating, ventilation, and air conditioning systems so as to maintain adequate temperature and humidity levels (Norbäck et al., 1990).

Medical history. Previous medical history (e.g., gastroesophageal reflux disease [GERD], laryngopharyngeal reflux [LPR], allergies, asthma, musculoskeletal tension, vocal nodules) and physical stressors (e.g., age, hormonal changes, medications, other substances) can contribute to vocal impairments. A review of the scholarly literature pinpointed how medical history affects the voice (Carding & Wade, 2000; Murry & Rosen, 2000; Smith, Lemke, et al., 1998). Teachers who have exhibited medical problems and displayed physical stressors may be more susceptible to laryngeal irritation and pathology (Murry & Rosen, 2000; Sala, et al., 2000; Sapir, Keidar & Mathers-Schmidt, 1993; Sataloff, 1998). Murry and Rosen (2000) reported that cigarette smoking contributed to hoarseness, and that LPR contributed to pharyngeal and laryngeal irritation. These authors stated that "the hallmarks of LPR are morning vocal roughness, throat clearing, and a globus sensation, all of which often improve during the day" (p.971). Carding and Wade (2000) reported vocal risk factors to include smoking, large amounts of alcohol consumption, and gastroesophageal reflux disease. To further determine if age has an effect on vocal misuse and vocal overuse, Smith, Lemke, et al. (1998) recommended further research in this area.

Stress and anxiety. Emotional state (e.g., stress, psychological factors) may contribute to vocal problems. A review of the scholarly literature revealed that stress and
anxiety negatively affect the voice (Gotaas & Starr, 1993; Orlova, Vasilenko, Zakharova, Samokhvalova & Kozlova, 2000; Sapir et al., 1993). Factors such as stress and anxiety may contribute to vocal misuse among teachers. Goldman, Hargrave, Hillman, Holmberg, and Gress (1996) studied four psychosocial factors: stress, anxiety, somatic complaints and voice use in women who evidenced vocal nodules. This study examined psychosocial factors in 27 adult subjects with vocal nodules, 17 adult subjects with hyperfunctional-related voices, and 33 adult subjects with no known vocal impairments. The results of the research revealed that the subjects with vocal nodules had higher scores for anxiety, somatic complaints, and voice use. The control group of adults with hyperfunctional vocal impairments demonstrated higher scores on stress, anxiety, and somatic complaints. There was no significant difference between the group with nodules and the control group. Goldman et al. reported that although additional research was needed, this exploratory study had preliminary clinical implications. The results of this study suggested that an assessment of psychological variables could lead to the development of a battery of tests assisting in the differential diagnosis of voice disorders. Additionally, Goldman et al. stated that “most of the pathological subjects displayed increased anxiety, it is expected that many patients with hyperfunctional voice disorders could benefit from being treated (voice therapy) in relaxation procedures” (p. 51). Voice therapy can include meditation and muscle-contrast exercises for the reduction of anxiety (Kabat-Zinn, Massion, Kristeller, Peterson, Fletcher, Pbert, Lenderking & Santorelli, 1992). Furthermore, Goldman et al. (1996) reported that

Although specific cutoff scores are not yet apparent, the use of instruments such as the State-Trait Anxiety Inventory and our somatic complaint checklist should likely be helpful in indicating which patients with hyperfunctional voice disorders
might be appropriate for other referrals (e.g., counseling, formal psychological assessments, etc.). (p. 51)

More specifically, Murry and Rosen (2000) targeted teachers and reported, “stress may be physical, as in the demands of school teachers who must teach in a noisy environment (next to a playground)” (p. 972). Gotaas and Starr (1993) speculated that duration of talking and loudness levels of teachers may not be totally responsible for their vocal fatigue. However, by conducting psychological assessments, it was determined that talking and loudness levels may have contributed to vocal fatigue. Gotaas and Starr stated the following:

The tendency for teachers who fatigue to perceive more speaking situations as being tense and their proneness to respond to threatening situations with high levels of anxiety may cause them to respond to these situations with vocal adjustments that lead to vocal fatigue. (p. 128)

Orlova et al. (2000) reported that vocal overload, psychoemotional stress, consistent colds, and a combination of these factors contributed to vocal problems among teachers. Interestingly, Sapir et al. (1993) stated that multiple vocal symptoms affected not only a teacher’s ability to adequately teach, but also revealed that the voice problem was a chronic source of anxiety and aggravation.

Relationship of the Problem to the Literature

A review of the professional literature examined vocal problems, supportive evidence, and possible causes of voice misuse and voice overuse. Various researchers have approached the problem of voice misuse and vocal overuse in unique ways. In order to address the relative problem to the literature four segments were explored: a) an overview of research conducted on voice-related problems, b) an overview of general
research on the vocal use of teachers and other professionals, c) an overview of prevalence, symptomology, and potential causes of vocal problems with teachers, and d) a summation of the relationship of the problem to the literature.

An overview of research conducted on voice-related problems. Voice disorders among teachers may be underestimated. Smith, Lemke, et al. (1998) stated that not all teachers seek treatment. Sapir et al. (1993) studied vocal attrition in teachers by administering questionnaires. These authors reported that of the 237 questionnaires obtained from female teachers, 20% of them sought medical help for their voice concerns, 33% reported that their voice problem hindered their ability to be effective when teaching, and 30% missed work due to their voice problems. Herrington-Hall, Lee, Stemple, Niemi, and Miller-McHone (1988) stated that teachers represent a significant portion of patients in search of medical and voice help for their vocal concerns. In order to further determine the incidence of voice disorders among teachers, it was essential to establish a criterion to define prevalence. Mattiske et al. (1998) found the following:

The criterion often employed was simply that the teacher consulted a physician or a speech pathologist for treatment of dysfunctional voice. The criterion does not adequately account for the severity of the problem or the effect of the voice problem on the teachers’ work. (p. 492)

Thus, reports of true prevalence of voice disorders in teachers may be underestimated as a result of discrepancies across studies.

The examination of vocal symptomatology assists teachers and professionals to best identify vocal fatigue factors. Gotaas and Starr (1993) reported that vocal fatigue is one of the most recurrent and puzzling problems experienced by persons in occupations that place high demands on the vocal mechanism. Vocal fatigue as defined by Gotaas and
Starr is a problem that “begins to occur as the speaking day progresses, is most evident at
the end of the day and usually disappears by the following morning. The problem is
characterized by changes in vocal quality, loudness, pitch, effort, or some combination”
(p. 121). Russell et al. (1998) acknowledged that the professional educator will
experience vocal fatigue, as well as an effortful and weak voice more than those
employed in other professions. Mattiske et al. (1998) provided a more comprehensive
approach, saying that vocal impairments not only are a manifestation of vocal fatigue and
weakness but also include hoarseness, harshness, aphonic breaks, ineffective pitch,
loudness modulation, and abnormal laryngeal sensations during conversational speech.
Kostyk and Putman-Rochet (1998) described vocal fatigue, as laryngeal mechanism
fatigue, which is often associated with teachers. The results of their study indicated that
vocal fatigue factors placed teachers at high risk for vocal problems. Since teachers are
susceptible and vocal fatigue is a cumulative factor, teachers are known to have a higher
incidence of vocal pathology. Mattiske et al. (1998) stated that teachers may become
more aware of vocal symptomology and, therefore, become increasingly concerned about
potential problems more than nonprofessionals.

Vocal problems among teachers can have an affect on longevity of teaching
careers. Vilkman (1996) determined that a number of teachers, in spite of their vocal
impairments, are capable of continuing their profession as teachers. However, Smith,
Lemke, et al. (1998) reported that there are teachers who miss work due to their voice
problems. Mattiske et al. (1998) stated that voice disorders have long been considered a
primary occupational hazard with school educators. Teachers who cannot communicate
effectively or those who present with chronic vocal pathology may need to leave the
teaching profession. Smith, Lemke, et al. (1998) found that teachers’ symptoms included
tired, weak, effortful voices with physical discomfort. Teachers perceived their dysphonic voices as having a negative impact on their work performance, which at the same time reduced other employment options. Teachers were also rated at high-risk for vocal disability. Health problems may have a profound work-related effect which results in economic concerns for teachers. Sala et al. (2000) identified an estimated 7,400 individuals (38%) in Finland who experienced voice disorders affecting their work performance. Verdolini and Ramig’s (2001) economic estimates of treatment expenses suggested that

Considering only lost workdays and treatment expenses, the societal cost of voice problems in teachers alone may be of the order of about $2.5 billion annually in the U.S. In fact, across several countries, “teacher” consistently emerges as the common occupation most likely to seek otorhinolaryngological (ORL) evaluation for a voice problem. (p. 37)

It is well documented that voice problems can promote absenteeism or even a potential change in career. Further research is necessary to identify a more accurate account of teachers who missed work or changed their careers due to voice problems. Perhaps additional investigations of how researchers could adequately identify teachers who exhibited voice problems as well as an increased teacher awareness that voice problems existed, can be an initial step. A variety of studies have examined these vocal intensity and vocal duration issues via the measurement of phonation time and vocal intensity. Research regarding when and for how long a teacher spoke with increased vocal intensity before developing a voice problem is important to review.

Masuda, Ikeda, Manako, and Komiyama (1993) found that there was minimal research regarding the speaking behaviors of patients who exhibited vocal abuse. The
purpose of Masuda’s study was to fill this gap and to investigate phonation time and vocal behaviors. Speaking behaviors and the etiology of voice disorders were assessed by using the Ryu, Komiyama, Kanna, and Watanabe (1983) therapeutic tool known as the speech intensity/speech time accumulator. Speech intensity and phonation times were examined utilizing the accumulator. Masuda et al. obtained data by accumulating the phonation time at 4 degrees of vocal intensity with a ranking system classification ranging from weak to strong. Vocal behaviors were analyzed and evaluations were made regarding vocal abuse and vocal misuse with this newly developed tool. These authors measured the speaking habits of 29 subjects for 131 days and obtained data about the criteria of vocal abuse. The results illustrated that the phonation time of office workers was $33.6 \pm 13.6$ minutes for 8 hours, which was recorded as three times shorter than the phonation time for teachers and patients which was recorded at $102.1 \pm 22.9$ minutes for 8 hours. Longer phonation times were considered a factor in vocal disorders and one half of the total phonation time was at high intensity for teachers and patients. Interestingly, Ryu et al. studied subjects in several occupations and identified a mean phonation time of 12 minutes per hour while Ohlsson, Brink, and Löfqvust (1989) studied the vocal use of speech pathologists and nurses with a mean phonation time of 3.18 - 4.14 minutes per hour. In summary, two subjects who were both diagnosed with vocal cord nodules were compared: a kindergarten teacher and a patient. The kindergarten teacher spoke very loudly during school hours, at an 80 dB SPL plus range, while the patient spoke as loudly due to habit. It is essential for the speech pathologist to assess when and for how long patients speak with an excessive volume in order to determine potential vocal misuse and vocal overuse.

*General research on the vocal use of teachers and other professionals.* At this
juncture, to further substantiate the prevalence of voice disorders among the teaching population, it was necessary to identify how the normal voice functions in persons who are not subjected to prolonged voice use. Stemple, Stanely, and Lee (1994) completed a study to assess laryngeal fatigue factors with normal voice users. Ten female graduate students with no known laryngeal pathology participated in this study. Strict criteria were established to determine what constituted a normal voice. These subjects were informed how to eliminate vocally abusive behaviors and were provided with stringent procedural guidelines. In order to determine vocal fatigue characteristics, the student participants read aloud in excess of two hours with minimal breaks. Pretests and posttests using acoustic, aerodynamic, and videostroboscopic measures were implemented. Following testing and analysis, it was determined that vocal fatigue factors were consistent with elevated fundamental frequency in speech, reading, and conversation. The development of a glottal chink was also evident. It was suggested that the involvement of the thyroarytenoid muscle might be linked to vocal fatigue. It was necessary to compare the voice use of healthy adults and teachers by examining normal voice patterns over periods of prolonged use and its impact on the vocal mechanism.

Comparative studies substantiated that elementary and high school teachers were at greater risk for vocal impairments than the general population. Identification of those particular groups of individuals who did not use their voice on a professional or frequent basis for functional communication was difficult to define. Smith, Lester-Kirchner, Taylor, Hoffman, and Lemke (1998) compared 554 elementary and high school teachers with 220 individuals in other professions. Thirty-two percent of the teaching professionals identified themselves as having voice problems, whereas only 1% of other professions identified vocal issues. Twenty percent of the teachers missed work, whereas,
only 4% of the non-teachers missed work due to voice-related illness. Although there was a statistical significance regarding teacher absenteeism, further investigation is warranted to identify teachers who missed work due to voice related illness throughout the year. Exposure to upper respiratory infections (URI) may have critically influenced the overall prevalence of voice problems with the professional educator (Smith, Lester-Kirchner et al., 1998).

In addition to the United States, vocal problems are widespread in other countries such as the United Kingdom, Canada, Japan, Finland, Sweden, Australia, Hong Kong, and Japan (Comins, 1992; Gotaas & Starr, 1993; Masuda et al., 1993; Sala et al., 2000; Russell et al., 1998; Vilkman, 2000; Yui & Ho, 1991). Vilkman (2000) reported the following:

Voice problems are common in general, but they are even more common in professions in which there is heavy vocal loading, i.e., professions that do not only require prolonged voice use, but also involve extra loading factors such as background noise, long speaking distance, poor room acoustics, lack of adequate equipment like voice amplifiers etc. (p. 120)

Among European countries, Finland is an excellent example of a country with professions of heavy vocal loading. As many as one third of Finland's labor force work in occupations that require constant vocal use. In Finland, the occupational groups that use their voice most frequently were business professionals and teachers. Other large working groups are telephone operators, military and clergy (Vilkman, 2000). In Australia, occupational voice use categories were further expanded (Mattiske et al., 1998).

Mattiske et al. (1998) recognized that specific professions such as teachers, singers, auctioneers, radio and television announcers, retired persons, homemakers, factory
workers, and executive managers not only required prolonged vocal usage, but were also influenced by additional loading factors, such as background noise, speaking distance, poor acoustical environments, and lack of suitable equipment. Vilkman (2000) found that teachers (e.g., kindergarten, elementary, middle and high school) represented a vocation that required heavy vocal demands). Furthermore, Vilkman stated the following:

The occupational safety and health arrangements of voice and speech professionals are poorly developed as compared to many other professions. However, the existing legislation could be used to support efforts to improve the working conditions of this large but heterogeneous group. (p. 120)

Vilkman (2000) identified vocal quality and vocal loading as two types of vocal usage that teachers were required to use in their profession. Demands of vocal quality were classified as moderate for the teacher, whereas, professions such as television and radio announcers or artistic professionals were rated higher. Vilkman also stated that vocal loading factors for teachers were rated high, whereas professions such as radio and television announcers, journalists, bankers, business, and insurance personnel were rated moderate in this area. Interestingly, actors and singers were rated high in both areas, whereas welders and foremen were rated low for vocal quality demands and high for vocal loading. In short, because teachers used their voices extensively in their profession, their demands for vocal endurance were significant and acoustic/environmental factors needed to be recognized (Vilkman, 2000). In addition to research focusing on the prevalence of voice disorders of teachers and high vocal users, it was necessary to identify whether vocal impairments differed between male and female teachers.

Smith, Lemke, et al. (1998) described the effects of vocal activities of male versus female teachers. Thirty-eight percent of the females versus 26% of the males reported
vocal problems. The females were rated higher than the males for obtaining medical care. This might have been due to the fact that females routinely sought medical attention more frequently than males (Smith, Lemke, et al., 1998). In this study, the effects of the aging voice slightly elevated the risk of vocal problems.

Female teachers have been classified as exhibiting a high rate of vocal vibration. During teaching instruction, the true vocal cords vibrate at an approximate rate of 15% to 40% of the time (Rantala, Haataja & Vilkman, 1994). The vocal folds are brought together with each vibration. The vocal cords are muscles, and just like any muscle, they can become overworked and overused. Repeated vocal cord adduction may contribute to laryngeal tissue changes and a straining of the laryngeal muscles (Stemple, Glaze & Gerdeman, 1995). Male teachers are less susceptible to disordered voice than female teachers, as their vocal cord vibration during the workday is approximately 50% less than that of female teachers. Russell et al. (1998) also identified that females have a tendency to promote effortful voicing. It was established that male and female teachers differ in the susceptibility of vocal impairment; however, it was necessary to explore how vocal fatigue affects elementary and high school teachers.

Gotaas and Starr (1993) studied vocal fatigue factors among 250 primary and secondary school teachers. A survey was used to identify vocal fatigue, its frequency, and its severity among these teacher groups. The study concluded that 80% of the involved subjects identified a vocal fatigue component. It was noted that these teachers participated in activities that required higher demands on the voice and that these teachers viewed these situations to be anxiety producing.

Experienced teachers also have student teachers or interns in their classrooms. These future teachers are potential groups for vocal problems. Simberg et al. (2000)
reported the prevalence of voice disorders among future teachers. These authors indicated that there were no studies that addressed the frequency of voice disorders; however, early detection, diagnosis and treatment of the voice were highly recommended. A total of 402 students, 310 women and 92 men ranging in age from 19-47 years, participated in this study. A questionnaire, a perceptual evaluation of quality of voice, and an examination by a laryngologist were conducted. In a previous pilot study, Simberg implemented a similar questionnaire with a few modifications. A certified speech pathologist with 15 years of experience conducted the evaluation using standardized instrumentation measures and ranked vocal characteristics on a questionnaire. These characteristics included throat clearing, voice easily tiring, sore throat, hoarseness, difficulty being heard, vocal breaks, and aphonia. In conclusion, vocal problems were frequent among these future teachers, and 20% of these students would have benefited from treatment and/or medical assistance. Contrastive differences between voice disorders in the nursing and teaching professions were also examined to further explore the prevalence of voice problems.

Sala et al. (2000) studied the prevalence of voice disorders by contrasting day care teachers and nurse practitioners. There were 262 day care teachers and 108 nurses who participated in this study. Based on laryngological examinations, questionnaires, and voice quality assessments, teachers presented with voice problems more often than the control group of nurses. Vocal nodules and laryngitis were more prevalent among the teachers than the nurses. Seventeen percent of these organic problems were attributed to vocal loading factors. Importantly, day care teachers were more prone to acute respiratory infections than nurses; laryngitis, rhinitis symptoms and sinusitis were identified twice as often as in the control group subjects. Gastroesophageal reflux was also addressed
because day care teachers often lift and bend during the day, which may provoke reflux.

Interestingly, International Business Statistics (2000) a European research and statistical website and the National Research and Development Centre for Welfare and Health (2000) reported that out of 2,500 preschool day care centers in Finland, approximately 9,500 day care teachers and 10,000 children’s nurses worked in day care centers. Since a significant population worked in daycare settings, this large sample size might be more representative to further substantiate the prevalence of voice disorders among teachers. Besides daycare, nursing and teaching settings, vocal use of female Israeli military army instructors and recruits during the work day was examined.

Sapir et al. (1990) surveyed 130 Israeli women army instructors, a high-risk group for vocal overloading, and 386 Israeli women army recruits, a presumed low-risk for vocal overloading. The purpose of this study was to determine vocal symptomology and the prevalence of voice disorders among army instructors and army recruits. Results yielded a high incidence of vocal overloading in both groups, with a notably higher frequency of voice use among instructors. There was a significant correlation between rapid bursts of speech and related symptoms, number of symptoms, and problems implementing instructional responsibilities for both groups. Almost 25% of the instructors did not demonstrate any vocal symptoms which suggested that not all individuals who placed extreme vocal demands on the voice would suffer from vocal damage. In this study, variables such as effective control of the laryngeal mechanism, vocal hygiene awareness, and biological malleability might have contributed to the absence of any vocal symptoms. These instructors were a unique group of individuals, chosen for their positions based on their aggressive nature, their ability to command, and their passion to excel. These findings suggested that vocal abuse/attrition could be linked
to environmental demands on the voice, distinctive speech habits, as well as to performance issues and work effectiveness.

Insights on prevalence, symptomatology, and causes of vocal problems. The literature revealed that vocal misuse and vocal overuse were evident in teachers, often placing them at high risk for vocal problems. The evidence also indicated that professional educators experienced vocal pathologies more than the general population. One cause was that teachers use their voices excessively, thereby contributing to vocal problems. Another cause was that vocal overloading and faulty use of the vocal mechanism contributed to vocal irritation and vocal pathology.

Teachers exhibited varied vocal symptomology. Vocal fatigue, sore throat, hoarseness, harshness, increased effort, running out of breath, vocal fatigue, pitch breaks, restricted pitch range, limited loudness, breathiness, aphonia, burning and dry throat, choking sensation, throat clearing and coughing, breathing difficulties, and swallowing problems were all symptoms associated with vocal misuse and vocal overuse. Some contributing factors were excessive talking, poor modulation, reduced hydration, specific environmental factors, poor acoustics, previous medical history, physical stressors, and emotional state.

Vocal problems also impacted teacher job satisfaction and feelings about their effectiveness with students. The evidence indicated that teachers might need to miss work or even leave the teaching profession when vocal problems became chronic. These might occur when teachers felt less effective at their jobs, had uncomfortable physical symptoms, or felt stressed.

Poor acoustics could affect the teacher’s ability to teach and the concomitant ability of the students to learn. Sound level measurements indicated that reverberations were
high in classrooms that had hard surfaces such as wooden and metal desks, tiled floors, and glass windows. Some causes of interference with the teaching process were elevated signal-to-noise ratio (S/N ratio), noise from nearby rooms, distance from the teacher, hearing ability of the students, lack of acoustical treatments in the classroom, and lack of standardization of classroom acoustics that was often due to limited funding.

Hazardous allergens, biochemical by-products, and germs in the classroom setting contributed to respiratory ailments and voice problems. The evidence suggested that children and teachers were susceptible to respiratory ailments and vocal problems which contributed to absenteeism. Sick building syndrome (SBS) caused irritation to the skin, eyes, upper airways, and could cause headaches and fatigue.

A final insight suggested that stress, anxiety, GERD, LPR, asthma, allergies, musculoskeletal tension, and chronic medical conditions contributed to vocal problems. The evidence suggested that these factors could contribute to disabled vocal cords, vocal irritation, and potential pathology. The causes were heredity, environment, or both heredity and environment. Case studies and anecdotal accounts should be explored in future studies because factors such as these might contribute to vocal pathology and these should be considered during the diagnostic assessment.

* A summation of the relationship of the problem to the literature. * A comprehensive review of the literature clearly addressed vocal prevalence issues among the teaching population. Frequent voice use could lead to vocal overuse and vocal misuse, a serious problem that is well documented in voice pathology literature. The research studies cited in this chapter revealed that professional educators experienced vocal pathologies more than the general population. Vocal misuse was evident in teachers and often placed them at high risk for vocal problems. Vocal problems could reduce effective communication
between teachers and their students. Preventative measures must be identified and
investigated in order to reduce or eliminate vocal problems among current teachers and
among future teachers. Teachers should be aware of vocal misuse, vocal overuse and the
necessary tools to prevent or correct the problem.

Vocal hygiene programs were offered in voice therapy through the dissemination of
written materials, counseling, or support groups (Comins, 1992; Verdolini-Marston,
Sandage & Titze, 1994; Stemple et al., 1995). In order to integrate good vocal techniques
the teacher must recognize that problems exist and that help is available. Due to time
constraints and the fast-paced lifestyle of the twenty-first century, it is difficult to find the
time to identify vocal problems or to remediate them. What type of preventative tool
could best serve the elementary school teacher to compensate for this fast-paced lifestyle?

Perhaps a professionally produced instructional videotape on vocal prevention
could serve as a model delivery system. An instructional videotape has the potential to
provide dramatic pictorial images in real life situations which are meaningful and
powerful to the viewer. An instructional videotape has the additional potential of
providing a model of vocal misuse and vocal overuse prevention, increasing awareness of
vocal misuse and overuse, reaching a wide audience, viewing as needed, reducing
medical costs, and adding to the quality of life of teachers. While participating in this
study, teachers may realize via introspection that they have voice problems. Participant
SLPs may find this instructional videotape to be a valuable and a useful tool for the
identification and prevention of voice problems among teachers. An instructional
videotape may also provide a means to help school-based SLPs perform informal voice
screenings with their faculty members. This applied dissertation could provide additional
clinical contributions in an area where preventative measures are scarce. This investigator
was invited to present the results of this study at several schools in this county’s public school district. In addition, this investigator has sent a proposal for submission to present this doctoral research at the Florida Association of Speech-Language Pathologists and Audiologists (FLASHA) 2003 Annual Convention.
Chapter 3: Anticipated Outcomes and Evaluation Instruments

Goals and Expectations

The goals and expectations of this applied dissertation study project were to explore how well a professionally designed instructional videotape would increase teacher awareness of vocal misuse and prevention in the workplace. This investigator expected that a preventative tool, such as an instructional videotape, would provide the initial step toward assisting elementary school teachers, kindergarten through fifth grade, to increase their awareness that vocal problems existed, and that remediation was available. The participants of this research were elementary school teachers and SLPs. Since SLPs were skilled in the identification, evaluation, and treatment of individuals with communication disorders, the SLPs served as experts to rate the quality of the instructional videotape for elementary school teachers. Furthermore, this investigator anticipated that the elementary school teachers would increase not only their awareness that vocal problems existed, but also that the teachers would be proactive by implementing good vocal hygiene in the classroom as a result of their participation in this study.

Both teachers and SLPs were selected for participation in this study based on their responses to a voice needs assessment questionnaire. Following established criteria for qualification, the teachers completed a voice prequestionnaire, viewed an instructional videotape, and completed a voice postquestionnaire in order to measure their knowledge gained, reactions to the instructional videotape, and potential behavioral change. Following established criteria for qualification, the SLP experts viewed the instructional videotape and completed a voice postquestionnaire to rate the value of the instructional videotape as a tool to increase teacher awareness of vocal misuse and prevention. An extensive amount of research, organization, and time was required during the
the instructional videotape preparation and, therefore, is important to review.

*Instructional videotape preparation.* The investigator of this applied dissertation first designed, created and directed this professional instructional videotape as an integral part of the study. Minds i No Limits, Corp. was retained for production and editing of this videotape. Saygo Studios was retained for post-production editing. All actors and participants of this project signed appropriate video release forms. Copyright permission was submitted to incorporate the original artists’ illustrations of the laryngeal structures of the larynx and voice problems. Select audio clips of voice qualities (e.g., a hoarse voice, a whispered voice, a strained voice, a weak voice, and a breathy voice), were used from Dworkin and Meleca’s (1997) *Vocal Pathologies: Diagnosis, Treatment, and Case Studies* CDs. Blausen Medical Communications, Inc. was retained to develop medical illustrations depicting a 3-D animation segment of the larynx, vocal inflammation, and vocal nodules. A professional spokesperson was retained to narrate and host this videotape. Medical disclaimers were included in select portions of this videotape.

The prologue included excerpts of individuals using their voices in a variety of settings. The title, *How to Use Good Vocal Behaviors in the Classroom*, was displayed. This writer interviewed and videotaped a group of elementary school teachers discussing their voice concerns. In order to obtain a representative sample from the teacher population, four elementary school teachers briefly reported their voice concerns, fading from one segment and segueing into another. Segments of these interviews were dispersed throughout the instructional videotape as appropriate.

For the introduction of the instructional videotape, the narrator began with a general overview that described voice use in the classroom and how it could lead to vocal overuse and vocal misuse. A brief statement described how elementary school teachers
experienced voice problems more often than the general population. This followed with a
risk factor statement. The purpose of this videotape was stated so the viewer could better
recognize and prevent voice problems. The discussion addressed the following areas: 1)
How voice is produced, 2) How elementary school teachers could misuse or overuse their
voices, 3) What stressors affect vocal health, and 4) What elementary school teachers
could do to avoid voice problems.

Part 1 of the instructional videotape included a basic review of the laryngeal
anatomy, laryngeal physiology, and voice production. A brief review of healthy vocal
cord appearance and unhealthy vocal cord appearance (e.g., inflammation, vocal nodules,
and laryngitis) was illustrated using 3-D animation and music.

Part 2 of the instructional videotape answered the following question: How do
elementary school teachers misuse or overuse their voices? A variety of settings were
used to illustrate factors that contributed to vocal misuse and vocal overuse. These
included a) teachers raising their voices for lunchroom, hall, bus, playground duties or on
field trips, b) teachers frequently talking and yelling, and c) teachers repeatedly clearing
their throat, etc. Then a list of questions was displayed on the screen (e.g., Do you often
have hoarseness?). Next the elementary school teachers identified those voice misuse or
voice overuse factors that were consistent with their own experiences.

Two ear, nose, and throat physicians answered frequently asked questions about
laryngeal problems and consulted with their patients who evidenced voice disorders.
Susan Berlinger-Schwartz, certified speech-language pathologist, provided an overview
of a voice therapy program for a patient. Videotape clips as well as still pictures,
animations, graphics, and music were used to illustrate these segments.

Part 3 of the instructional videotape answered the following question: What
stressors affect vocal health? Four segments were illustrated in this part of the instructional videotape. Firstly, elementary school teachers were asked to identify if they have or have had any voice symptoms. The teachers viewed a list of voice-related symptoms displayed on the screen (e.g., Do you have hoarseness or other problems with your voice?). The elementary school teachers might realize that their symptoms matched those described and might seek remediation or professional help. Videotape clips, graphics, and music were used to illustrate these segments.

Secondly, elementary school teachers were asked to identify if they currently have or have had changes in their voice quality. The teachers listened to a variety of voice samples such as a hoarse voice, a whispered voice, a weak voice, a strained voice, and a breathy voice. These teachers might have realized that their own voices sounded similar to the examples and that remediation could be helpful. Audio clips, videotape clips, graphics, and music were used to illustrate these segments.

Thirdly, the narrator discussed environmental stressors that affected vocal health (e.g., heat, ventilation, and air-conditioning [HVAC], poor acoustics, classroom size, hard surfaces that reverberate sound, etc). The narrator then discussed some ways in which environmental stressors might be reduced (e.g., adding rugs and curtains, proper storage of chemical products used for cleaning, building, or maintenance; proper cleaning of carpeting, ceiling tiles, and ducts). Audio clips, videotape clips, graphics, and music were used to illustrate these segments.

Lastly, the narrator discussed physical stressors that affected vocal health. (e.g., age, allergies, GERD, LPR, upper respiratory infections, fatigue, reduced hydration, hormonal changes, drugs, and germs caught from students). Audio clips, videotape clips, graphics, and music were used to illustrate these segments.
Part 4, the final segment of the instructional videotape, discussed vocal hygiene techniques and how the elementary school teachers could prevent voice problems. Preventative techniques were reviewed in the following format: 1) What teachers can do to prevent vocal misuse or vocal overuse in the classroom, 2) What students can do to help, 3) When to consult with your doctor, and 4) How to be kind to your voice. The narrator presented a brief summation. Audio clips, videotape clips, graphics, and music were used to illustrate these segments.

Expected Outcomes

*Elementary school teachers.* Step 1 consisted of the administration of a voice needs assessment questionnaire to elementary school teachers at selected school sites. One of the expected outcomes of this applied dissertation involved the design and administration of a voice needs assessment questionnaire that was used as a screening device to select a sample of teacher participants for this study. Specific criteria were established for teacher selection. Each teacher participant reported on the needs assessment questionnaire any history (i.e., prior or present) of vocal problems or answered in the affirmative by reporting at least one vocal symptom (e.g., hoarse voice, loss of voice, or vocal fatigue). All teacher participants acted on a voluntary basis. Subject to qualification and approval, this investigator included 54 elementary school teachers, kindergarten through fifth grade, as participants in this study.

Step 2 consisted of the elementary school teacher participants completing a voice prequestionnaire, viewing an instructional videotape, and immediately completing a voice postquestionnaire. The following outcome was projected for this study. As the initial implementation step of this research, a voice prequestionnaire was given to elementary school teachers by this investigator and two designated professionals. The
voice prequestionnaire provided the investigator with baseline information regarding teachers' awareness of their vocal problems and possible remediation. The viewing of the instructional videotape acted as the treatment portion of this study. Each teacher completed a voice postquestionnaire immediately following the viewing of the instructional videotape. This enabled the investigator to measure each teacher's knowledge gained, reaction to the instructional videotape, and potential behavioral changes.

Speech-language pathologists. Step 3 consisted of the administration of a voice needs assessment questionnaire to school-based SLPs. The following outcome was projected for this study. A voice needs assessment questionnaire was used as a screening device to select elementary school-based SLPs who acted as expert-raters in this study. The SLPs determined whether this instructional videotape would help increase teachers' awareness that vocal problems existed, that remediation was available, and whether this preventative tool was of value to elementary school teachers.

In order to determine expert-rater qualification, a voice needs assessment questionnaire was administered to elementary school-based SLPs who volunteered to participate. In order to qualify as an expert-rater, the SLP was required to have a minimum of one year of experience as a SLP and a self-rating on the needs assessment questionnaire of satisfactory or better in the identification, evaluation, and treatment of communication disorders. Of the 300 SLPs in this public school district, this investigator included 23 who qualified for participation on a voluntary basis.

Step 4 consisted of the school-based SLPs viewing the instructional videotape and immediately completing a voice postquestionnaire. The following outcome was projected for this study. As the initial implementation step of this study, the SLPs viewed the
instructional videotape. The viewing of this instructional videotape was the treatment portion of this research. The SLPs determined if this instructional videotape would serve as an adequate preventative tool to increase teachers' awareness that vocal problems existed and that remediation was available. The SLP voice postquestionnaire was completed immediately following the viewing of the videotape and enabled the investigator to measure the SLPs' reactions to the instructional videotape. The SLP voice postquestionnaire answered the question as to whether this instructional videotape would be a beneficial tool for increasing teacher awareness of vocal overuse and vocal misuse.

Measurements of Outcomes

Establishing qualification for elementary school teachers. To establish qualification for subject participation of elementary school teachers, this investigator analyzed the voice needs assessment questionnaires that were completed by the elementary school teachers. This questionnaire consisted of yes/no responses (nominal data), open-ended questions, and a comment section. Permission was obtained from four school sites where the study was conducted. Once the elementary school teachers completed the voice needs assessment questionnaires, they were collected and analyzed by this investigator. The number of teacher participants who met the established selection criteria qualified for participation in this study.

Implementation of the applied dissertation for elementary school teachers.

Subsequent to the voice needs assessment questionnaire analysis, this applied dissertation was implemented at pre-approved elementary schools in this county's district. A voice prequestionnaire, treatment, and voice postquestionnaire were administered to the elementary school teachers. The format of the questionnaires included a series of yes/no responses (nominal), open-ended questions, and a comment section.
Jacobson, Johnson, Grywalski, Silbergleit, Jacobson, Benninger and Newman (1997) developed and validated the Voice Handicap Index (VHI). The VHI was administered to the elementary school teacher participants and provided the investigator with baseline information regarding each teacher’s self-rating of vocal problems (see Appendix K for the VHI). Teachers’ self-ratings of vocal concerns would provide this investigator with specific information regarding whether vocal concerns related to emotional, functional or physical characteristics and this information could provide future implications. The data from the questionnaires were tabulated, analyzed, and presented in Chapter 5 using narrative and tabular forms.

In analyzing the prequestionnaire and postquestionnaire, it was determined that the scores could not be accurately reported as interval level data. Therefore, a non-parametric alternative was used to analyze the data. This investigator analyzed the results of this within-subject design for elementary school teachers that involved the use of the Wilcoxon’s matched-pairs signed-ranks test of significance as an alternative to the t-test for related samples. It tests data on at least an ordinal scale and does not require normality of distribution.

The Cronbach’s Alpha method (e.g., 1= very likely to 5= never) was employed for questions 12-18 of the teacher voice postquestionnaire and was used to determine the reliability of the testing instrument. The best way to conceptualize Cronbach’s Alpha was to consider it as the average of all possible split-half reliabilities for a set of items as it was a good test of reliability. Descriptive statistics were also included for these questions in the postquestionnaire. This provided the investigator with frequency of responses and percentage for each question using a ranking system.

Kirkpatrick’s (1994) Levels of Evaluation has been used to determine the
effectiveness of training programs. Kirkpatrick addressed a four level model to include reaction, learning, behavior and results. He states that these four levels are all important, and they should be understood by all professionals in the fields of education, training, and development .... the end result is simply to increase knowledge, improve skills, and change attitudes .... these four levels are recognized widely, often cited, and often used as a basis for research and articles dealing with techniques for applying one or more levels. (p. xiii)

Two levels of Kirkpatrick’s (1994) model were employed in this research to rate the elementary school teacher participants’ reactions to this instructional videotape and behavioral or attitudinal changes following viewing of the videotape. Other statistical analysis was used to measure learning and will not be reiterated. Kirkpatrick stated “as the word reaction implies, evaluation on this level measures how those who participate in the program react to it .... I call it customer satisfaction” (p. 21). He found that the “future of a program depends on positive reaction ... If participants do not react favorably, they probably will not be motivated to learn. Positive reaction may not ensure learning, but negative reaction almost certainly reduces the possibility of its occurring” (p. 22).

**Establishing qualification for SLPs.** To establish qualification for subject participation of the county’s SLPs, this investigator analyzed the voice needs assessment questionnaires which were completed by the SLPs. The format of the questionnaires included a series of yes/no responses (nominal data), open-ended questions, and a comment section. Once the SLPs completed the voice needs assessment questionnaires, they were collected and analyzed by this investigator. The number of SLP participants who met the established selection criteria qualified for participation in this study.
Implementation of the applied dissertation for SLPs. Subsequent to the voice needs assessment questionnaire analysis, this study was implemented using SLPs who had volunteered to participate and who had met the predetermined criteria. The SLPs viewed the instructional videotape and immediately completed a voice postquestionnaire. The format of the questionnaire included a series of yes/no responses, open-ended questions, and a comment section. The Cronbach Alpha method (e.g., 1 = very likely to 5 = never) was employed in the same manner as was used with the elementary school teachers in the voice postquestionnaire. The Cronbach's Alpha method was employed for questions 1-9 of the SLPs voice postquestionnaire and it was used to determine the reliability of the testing instrument. The best way to conceptualize Cronbach’s Alpha was to consider it as the average of all possible split-half reliabilities for a set of items as it was a good test of reliability. Descriptive statistics were also included for these questions in the postquestionnaire. This provided the investigator with frequency of responses and percentages for each question using a ranking system.

The Kirkpatrick's (1994) model was employed in the same manner as was used with the elementary school teachers in the voice postquestionnaire. Two levels of Kirkpatrick's (1994) model were employed in this research to rate the SLP participants' reactions to this instructional videotape and behavioral or attitudinal changes following viewing of the videotape.

Mechanism for recording elementary school teacher participants. Once the principals of selected elementary schools in this county's district approved teacher participation in this study, the voice needs assessment questionnaire was boxed, secured for confidentiality, and sent by Federal Express to each school site. Either the SLP of that school or the assistant principal acknowledged the receipt of the package. They
determined the time and the place for the distribution and completion of the voice needs assessment questionnaires. A prepared summation of the study was read aloud to the elementary school teachers at a faculty meeting or other designated location (see Appendix L for elementary school teacher voice needs assessment questionnaire instructions). The questionnaire was disseminated and completed at a faculty meeting by those who chose to participate. Upon completion, the questionnaires were returned to the school SLP or a designated professional. All completed questionnaires were boxed and sent via Federal Express to the investigator.

The implementation of this portion of the study for elementary school teachers took place during August through September of 2002. Each elementary school teacher who qualified participated. All participants in this project gathered in the same room for the administration of the voice prequestionnaires and voice postquestionnaires at their respective elementary school.

The investigator or a designated professional read aloud the instructions to ensure that the participants knew what to expect and how to comply (see Appendix M for elementary school teacher voice prequestionnaire and videotape viewing instructions). The investigator or a designated professional distributed a voice prequestionnaire to each participating teacher to complete. Each participant completed the questionnaire at the same time. Once the participants completed the voice prequestionnaire, the investigator and a designated professional collected the documents and placed them in a secured envelope labeled voice prequestionnaires and dated it.

The elementary school teachers viewed the entire videotape with a total viewing time of 16.45 minutes. Upon completion, the investigator read aloud the instructions prior to distribution of the postquestionnaire to ensure that the participants knew what to
expect and how to comply. Jacobson et al. (1997) was used as a supplement to the elementary school teacher postquestionnaire (see Appendix N for elementary school teacher voice postquestionnaire instructions). This self-rating voice scale provided the investigator with clear information regarding how frequently teachers used their voices and the degree of any voice-related disabilities. Each elementary school teacher completed the voice postquestionnaire at the same time. Once all the participants completed this postquestionnaire, the examiner and a designated professional collected the documents and placed them in a secured envelope labeled voice postquestionnaires and dated it. The investigator collected both envelopes and the instructional videotape for later analysis of data. The entire implementation process did not exceed 60 minutes.

Mechanism for recording SLP participants. The Curriculum Specialist of the Speech, Language, & Physically Impaired Programs of this county’s school district provided approval for SLP participation in this study. Once this approval was attained, the voice needs assessment questionnaires were boxed, secured for confidentiality, and sent by Federal Express to a SLP team leader. The SLP team leader presented six Federal Express secured boxes packaged with the appropriate number of questionnaires to six other SLP team leaders. Each SLP team leader provided the questionnaire packets to the school-based SLPs to generate interest for completion. A prepared summation of the study was read aloud by the investigator to the SLPs to ensure that the participants knew what to expect and how to comply (see Appendix O for SLP voice needs assessment questionnaire instructions). Upon completion, the questionnaires were returned through the courier system to the Curriculum Specialist of the Speech-Language & Physically Impaired Programs. In order to generate continued interest in this study and to obtain more SLP participants, additional questionnaires were submitted to the curriculum
specialist via Federal Express. These questionnaires were disseminated at the next SLPs district wide meeting. All completed questionnaires were boxed and shipped by Federal Express to the investigator.

The implementation of this portion of the study took place during the first semester of the academic school year in August of 2002. Each SLP who qualified for participation gathered together in one conference room. Prior to observing the instructional videotape, the investigator read aloud the instructions to ensure that the participants knew what to expect and how to comply (see Appendix P for SLP voice viewing videotape instructions). The SLPs viewed the entire videotape with a total viewing time of 16.45 minutes. A prequestionnaire was not given to the SLPs because the SLPs only acted as expert-raters. Expert-rater status had been accomplished when the SLPs completed the voice needs assessment questionnaire. Next, the investigator read aloud the instructions prior to distributing the postquestionnaire to ensure that the participant SLPs knew what to expect and how to comply (see Appendix Q for SLP voice postquestionnaire instructions). Each SLP completed the questionnaire at the same time. Once all the participants completed the postquestionnaire, the investigator or designated professional collected the documents and placed them in a secured envelope labeled postquestionnaires and dated it. The investigator collected the envelopes for later analysis of the data. The entire implementation process did not exceed 45 minutes. Since the SLPs participated in this research on a voluntary basis, the investigator offered incentives to promote SLP participation. Therapeutic supplies, books, and a standardized assessment were donated from a variety of therapeutic and educational companies (e.g., PRO-ED, LinguiSystems, Super Duper Publications, The Speech Bin, and AliMed).

Unexpected events. In addition to the goals and outcomes projected in this proposal,
other events occurred during the implementation phase that was not expected. The method used for documenting unexpected events was the use of a journal. A form was created for journaling (see Appendix R for journal form) that described actions and behaviors that occurred during the implementation process. Documentation of the investigator's feelings during the implementation process and any proposed solutions were included. Journal entries included the date and the time in order to ensure for accuracy and comprehensiveness during the implementation process. This investigator recorded the following features where appropriate: observations, academic queries, speculations, syntheses, revisions, and concepts.

*Internal and external validity factors.* Both internal and external validity factors were addressed. It was important that all conditions within the design be established and equivalent. This investigator ensured that any changes of the dependent variable were due to the treatment and not due to factors that could have influenced it. To promote equivalence, the instructional videotape was viewed under the same conditions (e.g., in school setting or conference room) versus the subjects watching the tape in an alternate setting (e.g. participants' home or at different times). Several plans were enacted to minimize sequencing effects. First, the length of the videotape was limited so that subject fatigue would not be an issue. Second, the ordering effects were not a factor because there was no time gap between the beginning and the end of the implementation of this treatment. This alleviated any performance improvement or decrement. Mortality was not an issue for the elementary school teachers as the prequestionnaire, treatment and postquestionnaire were completed on the same day. Maturation was not factored in the equation, as there was relatively little time between the administration of the voice prequestionnaires and postquestionnaires. Case history was factored in the equation
because the investigator knew in advance that a number of participants currently were receiving voice therapy or had received prior voice therapy, had participated in classes or seminars related to voice, or had worked as volunteers in the speech-language field.

It was well documented that there were very few preventative tools in the form of instructional videotapes; therefore, it was unlikely that the elementary school teacher participants had previously viewed a similar instructional videotape on preventative methods of vocal misuse and vocal overuse. Since the voice prequestionnaires and postquestionnaires were administrated on the same day, testing or test-practice effects were taken into consideration. Since the voice prequestionnaires and postquestionnaires were the same for the elementary school teacher participants, the investigator took into consideration any treatment changes that would be due to the treatment provided or to test effects that would be due to the practice of taking the prequestionnaire, test familiarity, and/or reduced test anxiety. Instrumentation was not a factor as there were no calibration methods used in this study. Statistical regression was not an issue because subject selection was based on selection criteria which were previously established.

External validity factors such as subject selection, reactive or interactive effects of pretesting, and reactive arrangements were considered. Threats to subject selection were not issues as the participants in this applied dissertation were representative of the population to which this author wished to generalize. All participants had characteristics in common. All were elementary school teachers in this county's public school district and had prior or current voice concerns. Reactive and interactive effects of pretesting were not potential threats because the elementary school teachers' voice needs assessment questionnaire and the elementary school teachers' voice pretest questionnaire did not interact with the independent variable in assessing the teachers' performance on
the dependent variable. Reactive arrangements were not factors because the elementary school teachers did not receive any special treatment, and they participated on a voluntary basis. The elementary school teacher participants were more likely to respond to the independent variable rather than the factor of being a participant in the study. The design issues addressed in this study controlled for this threat. SLPs received incentives, in the form of door prizes, to promote their participation in this research. A reactive arrangement did not appear to be a factor as each SLP participated voluntarily and completed the implementation prior to distribution of the incentives.
Chapter 4: Solution Strategies

Discussion and Evaluation of Solutions

It is well documented that professional educators experience vocal problems more often than the general population. Teachers are high volume voice users with frequent voice use throughout the workday. Teachers are more susceptible to vocal misuse because of environmental, occupational, and physical factors. Elementary school teachers use their voices not only during classroom instruction, but also by monitoring students during activities such as lunchroom duty, bus duty, hall duty, and playground duty. These duties are often in loud environments which require teachers to elevate vocal volume. Excessive talking, raising vocal volume, and yelling contribute to vocal misuse and vocal overuse. Some teachers complain of coughing, throat clearing, throat discomfort, pitch variation, and elevating vocal volume. These complaints often result in additional stress to the vocal mechanism which in turn leads to voice changes because of vocal misuse and vocal overuse patterns.

The topic areas researched for this literature review included a variety of methods and suggestions to increase awareness of vocal misuse, vocal overuse, and preventative measures for vocal problems. These methods and suggestions supported the use of preventative measures by teachers, lecturers, and other professionals who rely on their voice, and also those in training to become teachers (Blaylock, 1999; Carding & Wade, 2000; Comins, 1992; Johnson, 1985; Kaufmann & Johnson, 1991; Sapienza et al., 1999; Simberg et al., 2000). The following literature review specifically addresses vocal hygiene programs designed for and used by professionals who have a high incidence of voice use.

Johnson (1985) reported that although treatment and intervention are essential
regarding the rehabilitation of voice, a model of prevention is mandatory. A model of prevention is essential for making decisions about the treatment and the prevention of vocal misuse among teachers. Sapir et al. (1990) reported that further investigation is needed to determine whether vocal training programs are beneficial to prevent and reduce vocal abuse in prospective army instructors. The use of an instructional videotape as a vocal hygiene training tool as suggested in this applied dissertation would be valuable to prospective teachers as well as in this investigator's own private practice setting.

Kaufman and Johnson (1991) addressed educational training for teachers by disseminating informational videotapes to teachers. Kaufman and Johnson specifically targeted the need to develop a preventative measure videotape as part of a vocal hygiene program for educators. This investigator has also targeted the design and the implementation of an instructional videotape as part of a vocal hygiene program for educators. For this reason, a detailed description of Kaufman and Johnson's videotape is necessary to review. In 1987-1988, this project was initiated by Utah State University (USU) to aid in the prevention of vocal abuse. A key element of the USU project was the development of a videotape to address current information regarding vocal abuse and prevention, along with instructional information. The teaching population was specifically targeted, although many professionals could benefit from such a program. The professional educator concept was chosen for three reasons: (a) an extensive review of the literature found that teachers used their voices consistently in the work place, (b) teachers were readily available for field-testing, and (c) USU's clinic had extensive experience working with teachers who experienced vocal problems. Kaufman et al. further explained that there was a plethora of information concerning the diagnosis and the treatment of vocal disorders. They found a total of only 17 references that analyzed
vocal hygiene. Hence, less attention was paid to vocal hygiene and preventative measures.

Factors that affected vocal usage and strategies for the prevention of vocal disorders were significantly inconsistent. These inconsistencies in the USU study led to classifying this information into functional categories, from most frequent to least frequent, and thus a protocol was designed. It was reported that the development of the videotape was time consuming, tedious, and complex. The length of the videotape was 20 minutes and included the following categories: Anatomy and Physiology, Vocal Pathologies, Case Histories, Prevention Strategies, and Early Warning Signs. A booklet was integrated with the first four sections and the last section was developed as a checklist which was used with the videotape. The total cost for this project was $2,290.00 excluding research and development, writing time, editing, reviewing, traveling, and the hiring of consultants. It was further reported by Kaufman and Johnson (1991) that the benefits outweighed the costs. A positive response was ascertained following an extensive field-testing of the videotape.

After several viewings of the USU videotape, teachers were successful in assessing their own vocal behaviors and subsequently provided instruction to their students regarding healthy vocal usage. By providing this instrument to future teachers, it would clearly aid in the prevention of vocal misuse. Kaufman and Johnson (1991) stated that, “The project is one example of what can be done to disseminate preventative factors and strategies. It is, however, only a preliminary test of concept. Much ground is left to be plowed to bring prevention models to realization for other vocal risk populations” (p. 47).

The findings of this applied dissertation supported the idea that the dissemination
of an instructional videotape would be of value for prevention, treatment, and home programs for all patients with vocal concerns. This applied dissertation utilized a similar approach for addressing patients with vocal concerns. An instructional videotape not only offered this investigator’s current clientele a preventative tool to avoid vocal problems, but also offered other professionals who are high volume voice users the opportunity to increase their awareness of potential vocal misuse and vocal overuse patterns. In addition to high volume professional voice users from a variety of settings, this instructional videotape could be beneficial to prospective teachers at the local, state, and national levels as this tool could allow teachers to identify those factors that could lead to potential voice problems early in their careers.

Comins (1992) promoted a voice care and development program that provided teachers with voice workshops in the United Kingdom (UK) from 1989-1992. Over 700 teachers attended these workshops that addressed the voice mechanism, increased awareness of proper voice use, and promoted effective voicing by incorporating physical ease, relaxation and breathing, and projection strategies. The primary focus was the use of proper respiration and resonance to enhance projection in lieu of pushing and effortful speech. Instruction for these classes was conducted by a certified speech pathologist, vocal coaches, and teachers. The largest group that attended the workshops was primary teachers. Comins reported that the National Union of Teachers, the National Health and Safety Executive, and the Professional Association of Teachers, showed interest in attending these workshops. Further documentation substantiated that the Health and Safety Executive Group promoted awareness through the Educational Advisory Group and the Educational Interest Group due to the positive response and reported benefits of this program. Comins reported that although vocal hygiene workshops were beneficial to
increase awareness of vocal misuse and vocal overuse, the workshops only offered short
exposure time to the topic at hand.

The investigator’s rationale for choosing an instructional preventative videotape
was for the purpose of independent practice. It could be helpful for state and regional
teachers’ organizations to recognize the importance of good vocal hygiene use in the
classroom as this topic is usually not addressed in the college level teacher training
curriculum nor in school district training programs. An instructional videotape could be
an effective and economical vehicle to remind teachers how to use proper vocal
behaviors because it would be a time consuming process and costly for these
organizations and school districts to establish guidelines and standards for a vocal
hygiene program in the schools.

Chan (1994) explored the topic of voice improvement with vocal hygiene education
by studying instrumental voice measures in a group of kindergarten teachers. Chan
reported that few studies addressed the efficacy of vocal prevention for professionals who
use their voices constantly throughout the day (e.g., singers, actors, and teachers). Chan’s
study was completed in order to fill this gap. By utilizing an experimental design format,
the exploration of the efficacy of vocal hygiene programs was employed for an at-risk
professional group, namely kindergarten teachers. The results of this study were positive,
as teachers were successful in improving their voice by using vocal hygiene education,
regardless of their age and years of experience. There was no evidence of vocal
improvement in the control group. A rationale for the vocal improvement of some of the
teachers was provided. Teachers believed that specific negative vocal behaviors affected
their voices, and that the implementation of vocal hygiene techniques should be
employed to reduce vocal abuse. In addition, teachers used their voices to maintain
classroom order which resulted in vocal abuse. When the teachers adapted specific
techniques to minimize vocal output (e.g., using a buzzer or a bell to gain attention) the
vocal abuse was minimized. A comprehensive vocal hygiene education program was
included in Chan’s article. Chan suggested that experimental studies could be beneficial
to identify at-risk professionals. Chan’s study conclusively showed that with education
and insight teachers improved their vocal environment, thereby, reducing vocal abuse.
This applied dissertation allowed teachers to identify with appropriate and inappropriate
vocal behavior patterns while watching an instructional videotape. This instructional
videotape allowed teachers to find solutions for inappropriate vocal behavior patterns.
Teachers could either use the methods outlined in the instructional videotape or modify
them to accommodate their work, schedules, activities, and lifestyles.

Verdolini-Marston et al. (1994), in a double-blind study, using a placebo-controlled
approach, observed the effects of hydration treatments on six adult females with
laryngeal nodules and polyps. The subjects received either hydration treatments or
placebo/control treatments for five consecutive days. When combining the results, there
was an improvement in voice and the appearance of the laryngeal region when both
placebo/control and hydration treatments were compared to the initial baseline. The most
improvement was reported with only hydration treatment. This study suggested that
intensive hydration programs might result in beneficial treatment to individuals who
present with organic vocal pathology. Hydration methods were found to be beneficial for
the vocal cords as well as for other parts of the body. The investigator of this applied
dissertation incorporates the use of hydration as a crucial part of clinical practice for all
forms of preventative vocal treatment. By stressing the benefit of vocal hygiene programs
as a preventative tool, this instructional videotape could provide further education
regarding vocal hygiene benefits for the elementary school teacher as well as other clientele who present with voice disorders.

Stemple et al. (1995) addressed an effective way to reduce vocal misuse by applying vocal hygiene counseling. When vocal abuse has been identified, the initial step in incorporating vocal hygiene counseling is to provide vocal education to the patient. Vocal education includes increasing awareness of vocal abuse and the effects it has on the laryngeal mechanism. Implementing pictorial representations of the anatomy and physiology, as well as an explanation of structures and function, could be beneficial. If laryngovideostroboscopic examinations were completed as part of the evaluation and therapeutic processes, these could serve as an excellent tool in the educational process. Understanding the cause and effect relationships of a particular vocal problem could be an excellent way to aid in resolving the voice problem. Stemple et al. designed a four-step outline regarding vocal hygiene methods which included the identification of vocal abuse, the effects of vocal abuse to the laryngeal mechanism, the definition of vocal abuse occurrences, and the modification of ineffective vocal behaviors.

Vocal hygiene counseling is of vital importance and it was an integral part of this investigator’s applied dissertation. The instructional videotape offered the elementary school teachers in this applied dissertation each of the four components that Stemple et al. had designed in his vocal hygiene program. The segment titles of this investigator’s instructional videotape discussed: a) How voice was produced by using 3-D animation, b) How elementary school teachers misused or overused their voices by offering videotaped examples of actual teachers displaying vocal overuse and vocal misuse in a variety of school settings, c) What stressors affected vocal health by offering videotaped examples of physical, occupational, and environmental stressors, and d) What teachers could do to
avoid voice problems by outlining many methods to increase awareness that vocal problems existed and that modification of poor vocal behaviors was available.

Smith, Lemke et al. (1998) provided yet another suggestion regarding prevalence and prevention issues:

It is still unclear what characteristics lead to higher rates of voice symptoms among a large number of, yet not all, teachers. These factors need further investigation as it may suggest vocal habits that can be prevented or environmental factors that can be altered. Such information should be useful in preventing voice problems among those employed in other high-risk jobs and lead to more fruitful joint investigations between basic and clinical scientists. (p. 334)

Smith, Lemke et al. reported that poor vocal habits or environmental factors that contributed to vocal pathology could be modified. The reduction of poor vocal habits and the identification of environmental factors negatively impacting voice could be beneficial for the prevention and the treatment of voice disorders. Poor vocal habits and environmental factors are addressed in this investigator’s clinical voice evaluation case history protocol for patients. Vocal hygiene counseling would be of value in this investigator’s clinical setting because it has been proven to be effective. For decades, the implementation of counseling techniques has been a standard part of this investigator’s vocal rehabilitation protocol. This investigator’s instructional videotape demonstrated how environmental factors could contribute to vocal misuse and vocal overuse and how these factors could be identified in a counseling treatment.

Rantala, Paavola, Körkkö, and Vilkman (1998) stated, “Clinical work and experience strongly suggest that to improve the occupational health and safety situation in voice professionals, more information and data are needed on the possible effects of
vocal loading on voice production" (p. 206). Since teachers were reported to be at high-risk for vocal impairments, it appeared to be a universal problem rather than population-specific; it is imperative to establish preventative and even early intervention programs. Suggestions for vocal training programs in colleges and preventative speech therapy programs in the educational systems deserve exploration. Clinical trial intervention systems need to be designed and evaluated, because not all techniques will positively enhance vocal outcomes (Smith, Lester-Kirchner et al., 1998). Additionally, Rantala et al. (1998) concluded that further methods for field assessment of speech and voice professionals, as well as an improved standardization of clinical vocal recordings, are strongly recommended. Providing vocal training and preventative speech therapy programs to college level students might be a consideration for this investigator's clinical practice. This investigator's instructional videotape could be utilized not only as an initial step for the early detection of elementary school teachers who displayed vocal misuse and vocal overuse, but also for teachers in training.

The Occupational Safety and Health (OS&H) legislation in European countries promotes a healthy and safe work environment (Vilkman, 1998). Vilkman completed a widespread study in Europe to determine occupational, safety, and health conditions of voice. Vilkman used a questionnaire format and responses were received from 15 different countries. The questionnaire included topics on prevention and inspection, training, working conditions, suitable equipment, diagnostics and treatment, and social and economic factors. The predictable conclusion was that the occupational safety and health condition of voice and speech professionals was rated as poor. Vilkman reported the following:

Considering voice problems at work as an OS&H issue would be rightful and
would contribute to a better understanding, prevention and control of the inherent
risks present in voice and speech professions. In a pragmatic sense, we will need
more research done in the field conditions, [sic] we will have to practise [sic] the
mapping hazards, risk analysis and testing of solutions, [sic] we will have to
develop adequate examination strategies, tools, such as standardized questionnaires
and procedures. Close cooperation with existing OS&H organizations will naturally
be crucial for successful development. (p. 15)

Continued research in the prevention of vocal issues in teachers was highly
recommended. Legislation to promote healthy and safe work environments could be
beneficial for establishing standards here and abroad. Occupational and safety issues in
the United States have not been well addressed. Recommendations regarding healthy and
safe work environments to improve voice are included as standard practice of this
investigator’s clinical vocal rehabilitation program. School districts want to provide
healthy and safe work environments for their teachers and, therefore, this instructional
videotape could be appropriate for establishing better teaching environments. This
investigator’s instructional videotape could be used as a preventative tool and reach the
public and private school districts at the local, state, and national levels.

In a more recent study, Simberg et al. (2000) suggested that an informal screening
tool should be developed and implemented for all students entering the teaching
profession. Vocal training programs addressing good vocal hygiene should be offered in
educational institutions. An informal screening tool for teachers and other professionals
who use their voices as their primary tool in the workplace could be helpful for the
identification of vocal problems. This instructional videotape could be useful for
elementary school teachers and prospective teachers as an aid in the identification and
the remediation of vocal problems.

Sapienza et al. (1999) and Rosenberg, Blake-Rather, Heavner, Allen, Redmond, Phillips, and Stigers (1999) examined the effects of sound-field frequency modulation amplification by increasing the sound pressure level in classrooms to reduce the speaking effort of teachers. Sapienza et al. (1999) reported that teachers exhibited vocal fatigue and hoarseness, which may have been due to a consistent increase of volume during classroom instruction. Ten teachers with and without the use of amplification participated in this study. A significance of 2.42-dB in SPL with the implementation of sound-field amplification was reported. Supportive data for use of this amplification was recommended for preventative techniques in vocal management programs for teachers in an instructional setting. Rosenberg et al. (1999) completed a special project to identify if students' listening and learning behaviors increased by implementing an FM sound field classroom amplification system. The Easy Listener Free System™ by Phonic Ear was utilized. Even though the goal of this study was to determine if improving classroom acoustics (ICA) aided students' learning, amplification methods were also found to be of value in the prevention and the reduction of vocal pathology in teachers. In a three-year project, Rosenberg et al. investigated 2,054 students in 33 elementary schools in Florida. Amplification levels for teachers were enhanced by +6.94 dBA of vocal intensity. Outcomes of this large sample study suggested that students displayed improved listening and learning behaviors and skill levels. Rosenberg et al. reported that implementing classroom amplification not only improved childrens' ability to learn but also, "it decreases teacher's voice problems, reduces vocal strain, produces a more relaxed feeling when teaching, and teachers feel less tired at the end of the day" (p. 22). This information regarding amplification has
been addressed as one valuable tool for prevention programs. If this study were replicated, perhaps reverberation along with noise could be measures of poor classroom acoustics. The utilization of sound-field modulation amplification could be of value in a work or social setting to reduce effortful voice. Amplification techniques have been identified to reduce teachers' vocal strain, promoting a more relaxed laryngeal area for easy voice onset, and decreased level of vocal fatigue at the end of the workday. The use of portable amplification units as a preventative measure was presented in this investigator's instructional videotape as a viable option for teachers to reduce their vocal volume in their work environment, thereby, reducing strain and stress to the vocal region.

Vilkman (2000) reported that, vocal impairments were not considered an occupational disease in European countries. There was lower compensation for treatment and rehabilitative services during sick leave, poor opportunities for prevention and re-education, and reduced sick disability pension for total disabilities. Vilkman stated that continued research for the development of safety and health issues regarding identification and prevention measures for teachers has been strongly advised. From this investigator's clinical perspective, vocal impairments should be considered an occupational disease and should be handled in the same manner as other medical conditions. The Occupational Safety and Health Administration (OSHA) Department of Labor should address this issue. This investigator's applied dissertation offers a vehicle in the form of a preventative instructional videotape, as an initial step to educate OSHA or other educational organizations about the importance and the value of vocal hygiene education for teachers. Teachers who reviewed this instructional videotape not only increased their awareness that vocal problems existed, but also learned to modify poor vocal behaviors. This could reduce teacher absenteeism, reduce medical costs, and
even possibly reduce career change moves from teaching to other professions.

Sala et al. (2000) reported a high incidence of vocal disorders among teachers in day care settings; if risk factors are recognized, then protective vocal care could be part of a routine re-education program. If etiological factors were decreased through integrated treatment then the probability of recovery could be higher. Sala et al's program consisted of vocal care and the reduction of noise levels in the day care setting. This vocal preventative program included

(1) Giving ergonomic knowledge to diminish voice disorder risk factors while working, (2) to teach voice training to people working in day care centers, and (3) applying voice disorder screening tests as part of the occupational voice care activity. The reduction of noise levels includes (1) to define proper acoustics needed in day carer centers, and to put together a guide of how to create proper acoustics, (2) to inform the decision makers about the effects of noise on humans, and (3) applying proper acoustics in new day care center facilities and in the renovation of old day care centers according to the given guidelines. (p. 9)

Realizing future implications, E. Salsa (personal communication, January 24, 2001) stated that there were plans for "preparing a multimedia program for voice disorder prevention purposes." Furthermore, Salsa reported data were being collected to determine what should be incorporated in such a tool. Routine re-education programs could be of value to identify at-risk individuals in various settings. This investigator's instructional videotape offered comparable suggestions as did Sala's vocal preventative program. This instructional videotape provided education, identification of vocal stressors, and preventative techniques for reducing poor vocal habits in the classroom. Both Sala and this investigator understood the importance of vocal hygiene prevention
and supported the concept that a vocal hygiene tool in the form of a multimedia program
was valuable to the professional voice user.

Vocal misuse and overuse is evident with teachers, often placing them at high risk
for vocal problems. A common thread in the review of the literature suggested that voice
training utilizing a good vocal hygiene model of prevention was needed. Types of vocal
hygiene prevention programs included workshops, dissemination of voice educational
materials and brochures, hydration treatment, vocal hygiene counseling, and instructional
videotapes. Poor vocal habits and environmental factors that contributed to vocal misuse
and vocal overuse must be investigated. More research is needed to delineate the true
cause of voice disorders. This research could aid in the development of effective
preventative vocal hygiene programs for teachers.

Description of Selected Solutions

There were several ideas generated as a result of reviewing the literature on vocal
misuse, vocal overuse, and vocal hygiene education. Firstly, the true prevalence of vocal
misuse was underestimated in the research literature. Secondly, underestimation did not
present an accurate picture of the status quo, so teachers, as high volume voice users,
were not getting the help they needed.

This applied dissertation increased the awareness of vocal misuse and vocal overuse
so that professional educators who needed help became aware of the resources available
to them. Traditional preventative vocal hygiene programs, an integral part of vocal
prevention for teachers, were reviewed in this applied dissertation. A new concept for
vocal prevention, an instructional videotape, has the potential of increasing awareness of
vocal misuse and vocal overuse, reaching a wide audience, reducing potential medical
costs, providing a model of prevention, and adding to the quality of life of teachers. This
instructional videotape is a revolutionary idea that had an impact on the participants in this research and public school clinical audience. Other educators and SLP's at participating school districts and wider audiences could benefit from this instructional videotape as well. An instructional videotape has the potential to provide dramatic pictorial images in real life situations which could be meaningful and powerful to the viewer. Thus, this medium has the potential to be used for Telehealth technology. The solution was to design, to create, and to produce a professional instructional videotape.

It was expected that upon viewing this instructional videotape, elementary school teachers would have an increased awareness of vocal misuse and vocal overuse and they would relate in a positive manner to suggested preventative solutions. The solution was justified by its relationship to this investigator's causal analysis in Chapter 2. It was established that teachers were at risk for vocal problems as they used their voices consistently throughout the working day. It was further established that noise, class size, quantity of speaking during the workday, acoustics, health contaminants in the classrooms, previous medical history, environmental factors, physical stressors, and emotional state were contributing factors to vocal misuse and vocal overuse.

The relationship between the solution strategies and this investigator's projected outcomes was reviewed. Teachers increased their awareness of vocal misuse and vocal overuse by viewing this instructional videotape which was produced for this purpose. SLPs determined if this instructional videotape had value for increasing teacher awareness of vocal misuse.

Report of Action Taken

This investigator took a leadership role during the implementation of this applied dissertation and coordinated all correspondence to the school board, the production
agency, the agents for actors and all other participants necessary for the completion of this project. This investigator created the instruments necessary to implement this study (e.g., the voice needs assessment questionnaires, voice pre/post questionnaires, and the instructional videotape script). This investigator directed and assisted in the production of the instructional videotape, created the accompanying videotape insert describing the instructional videotape's intended purpose, and outlined its contents. This investigator evaluated the final instructional videotape for editing prior to the implementation process. These aforementioned items were completed prior to the implementation of the questionnaires.

*Report of action for the SLP.* The implementation of this study for SLP participants took place during the first semester of the academic school year commencing in August of 2002 as expected. Each SLP who qualified for participation in this project gathered together in one conference room on August 21, 2002 to participate on a volunteer basis. Each SLP watched the instructional videotape and completed the SLPs' voice postquestionnaire. This investigator provided each participant with raffle tickets for door prizes as incentives for the SLPs to participate in this research. Donations were provided from educational companies (e.g., PRO-ED, LinguiSystems, Super Duper Publications, The Speech Bin and AliMed).

This investigator journaled unexpected events of the SLP implementation portion of this research. The SLPs' voice postquestionnaire was disseminated and collected by this investigator and designated professionals. Due to the large number of participants (116) during the implementation phase, and in order to save time, it was decided that the participating SLPs would place their completed voice postquestionnaire in a box designated by the investigator.
The investigator discussed questions that arose following the viewing of the instructional videotape. Many SLPs were interested in obtaining a copy of this instructional videotape to present to the teachers at their individual schools. Due to this interest, the investigator made a general announcement that a copy of the instructional videotape and applied dissertation would be presented to the county’s public school district at an appropriate time. It would be made available to the SLPs by the curriculum specialist for Speech, Language and Physically Impaired Programs.

_**Report of action for the elementary school teacher.**_ The implementation of this study for elementary school teachers took place during September of 2002 as expected. Four elementary schools participated in this study. Each elementary school teacher who qualified for participation in this project was gathered in the same room at their respective schools to participate in this investigator’s research. Each elementary school teacher volunteered, completed a voice prequestionnaire, watched the instructional videotape and completed the voice postquestionnaire. Implementation took place on four different days during the month of September 2002.

This investigator journaled unexpected events during the elementary school teachers implementation portion of this research. It was expected that the elementary school teachers would be silent while completing the prequestionnaire and postquestionnaire. At the first two participating schools, it was necessary for this investigator to remind the teachers that they were participating in research and that all documents had to be completed independently. The teachers complied with the investigator’s request. At each of the remaining two participating elementary schools, an additional statement was made by the investigator regarding the need for quiet and self work. The elementary school teachers at these two sites complied without reminders.
The investigator was available to discuss any questions that arose following the viewing of the instructional videotape. Many elementary school teachers verbally expressed that this instructional videotape would be a benefit for other educators to increase awareness that teachers are at risk and that help is available. The instructional instructional videotape was well received by participants at each school site.
Chapter 5: Results

Results

It is well documented that teachers experience vocal pathologies more than the general population. Vocal misuse and vocal overuse are evident with elementary school teachers, high school teachers, university professors, exercise instructors, and other instructional disciplines, often placing them at high risk for vocal problems. Elementary school teachers were chosen as subjects for this applied dissertation as they are high volume voice users with frequent voice use throughout the workday. They are more prone to vocal misuse and vocal overuse because of environmental, occupational, and physical factors. Elementary school teachers use their voices during daily classroom instruction as well as during supervision of students and during other school activities. Lunchroom duty, bus duty, hall duty, and playground duty are often conducted in loud environments which require teachers to raise vocal volume. Coughing, throat clearing, throat discomfort, pitch variation, and elevating vocal volume are common complaints of some teachers. These complaints often result in additional stress to the vocal mechanism which in turn leads to voice changes because of vocal misuse and vocal overuse patterns.

The research question proposed by this applied dissertation was to investigate how well a professionally designed instructional videotape would help elementary school teachers increase their awareness that vocal misuse and vocal overuse existed and that remediation was available. This investigator resolved the question by creating, editing, and producing an instructional videotape that elementary school teachers viewed as a preventative vocal hygiene tool.

Elementary school teachers and SLPs were the participants in this research. Since SLPs are skilled in the identification, evaluation, and treatment of individuals
with communication disorders, the SLPs served as expert-raters to determine whether this
instructional videotape was of any value for elementary school teachers by viewing the
instructional videotape and completing a postquestionnaire. The elementary school
teacher and SLP outcomes were examined. The outcomes reviewed for elementary school
teachers included establishing subject selection by completion of the voice needs
assessment questionnaire, the administration of the VHI, voice prequestionnaire and
voice postquestionnaires, the significance of the treatment, and the participants’ reactions
and behavioral changes post treatment.

*Expected outcomes of elementary school teachers.* Step 1 of the process consisted
of the administration of a voice needs assessment questionnaire to elementary school
teachers at selected school sites. The outcome projected for this segment of the study was
met. This investigator developed a voice needs assessment questionnaire which was
administered to elementary school teachers as a screening device to select a sample of
teacher participants for this study. Specific criteria were established for teacher selection.
Each teacher participant reported on the needs assessment questionnaire any history (i.e.,
prior or present) of vocal problems. In addition, each teacher participant answered in the
affirmative by reporting at least one vocal symptom (e.g., hoarse voice, loss of voice, or
vocal fatigue). All teacher subjects participated on a voluntary basis. Subject to
qualification and approval, 85 elementary school teachers, kindergarten through fifth
grade, were selected as participants in this study.

Eighty-five elementary school teachers completed the voice needs assessment
questionnaire. Of those 85 participants 31 or 36.5% did not meet the criteria established
for qualification. Fourteen of the 31 elementary school teachers or 45% did not meet the
qualifying criteria and 17 or 55% of them did not participate in the implementation
segment of this research by completing the voice prequestionnaire, viewing the instructional videotape, and completing the voice postquestionnaire. In other words, some elementary school teachers only completed a segment of the process and thus were excluded. Fifty-four or 63.5% of elementary school teachers qualified to participate in this research project.

Step 2 of the implementation process consisted of the elementary school teacher participants completing a voice prequestionnaire as well as Jacobsen’s (1977) VHI, viewing an instructional videotape, and immediately completing a voice postquestionnaire. The outcome projected for this segment of the study was met. The voice prequestionnaire was administered to elementary school teachers by this investigator. The voice prequestionnaire provided the investigator with baseline information regarding any exposure, prior training, and experience in the speech-language field as well as each teacher’s awareness of vocal problems. Exposure to the speech-language field could have been a factor of test-practice effects and will be discussed in the analysis section. The VHI provided the investigator with baseline information regarding each teachers’ self-rating of vocal problems. Teachers’ self-ratings of vocal concerns would provide this investigator with specific information regarding whether vocal concerns related to emotional, functional or physical characteristics and could provide future implications. The viewing of the instructional videotape acted as the treatment portion of this study. Each elementary school teacher completed a voice postquestionnaire immediately following the viewing of the instructional videotape. This enabled the investigator to identify elementary school teachers’ reactions to the instructional videotape, knowledge gained by viewing the instructional videotape, and potential behavioral changes following the completion of the voice postquestionnaire.
Fifty-four elementary school teacher participants completed the implementation segment of this research. Each teacher participant completed the voice prequestionnaire, viewed the instructional videotape and completed the voice postquestionnaire. The voice prequestionnaire provided the investigator with additional information. Of the 54 qualifying elementary school teachers, a total of 12 or 22% had some type of exposure to the speech-language field. Ten of the 12 or 19% had seen a professional for voice-related problems. Two of the 12 or 4% were currently seeing a professional for their voice. Five of the 12 or 9% had participated in classes or seminars related to voice, and three of the 12 or 6% had worked as volunteers in the speech-language field. Teacher participants who had been exposed to the speech-language field would be a factor of test-practice effects. It was unknown whether 22% of the teacher participants showed improvement due to past experience, due to treatment or a combination of both. The investigator attempted to better control for test-practice effects by using open-ended questions for the voice prequestionnaire and postquestionnaire versus multiple choice or dichotomous responses. Either the participants knew the answer or did not know the answer on the voice prequestionnaire. If the elementary school teachers exhibited improvement on the postquestionnaire it could have been due to learning.

The data suggested that only 22% of the 54 qualifying participants presented with some identified vocal concerns as determined on the voice needs assessment questionnaire. Based on the number of participants, this further substantiates the notion that the elementary school teachers who presented with vocal problems were not aware that remediation was available, might not have known who or where to seek help, or might not have been able to afford voice rehabilitation services. This investigator found that an instructional videotape could increase teachers’ awareness that vocal problems
existed and prompt the elementary school teachers to seek medical attention when necessary.

The VHI provided the investigator with a multitude of information. There were 30 voice self-rating questions: ten with emotional content, ten with functional content, and ten with physical content. Jacobson et al. (1997) defined the emotional subscale type statements as “representing a patient’s affective responses to a voice disorder” (p. 67). An example of a probe item from the emotional content domain was, “I feel annoyed when people ask me to repeat” (p. 67). These authors defined the functional subscale type statements as describing “the impact of a person’s voice disorder on his or her daily activities” (p. 67). An example of a probe item from the functional content domain was, “My voice problems cause me to miss work” (p. 67). The physical subscale statement was described by these authors as “representing self-perceptions of laryngeal discomfort and voice output characteristics (e.g., voice pitched too low or high)” (p. 67). An example of a probe item from the physical content domain was, “I feel as though I have to strain to produce voice” (p. 67).

Table 1 represents an analysis of the VHI. There was a total of 1,470 possible responses on the VHI for the emotional, functional, and physical subscales. Each participant scored between 0 and 30 responses. A score of 0 suggested that the participants had no vocal concerns relating to emotional, functional, or physical characteristics. A maximum score of 30 suggested the highest score of vocal concern with equal distribution of concern between all the subscales. Only 49 out of 54 participants or 91% were analyzed in this portion of the study. Five participants were removed from this segment as they did not follow the examiner’s instructions. These five teachers did not place their names in the requested box on the VHI nor fill out any part of
Table 1

*Analysis of Voice Handicap Index (N = 49)*

<table>
<thead>
<tr>
<th>Subscales</th>
<th>Responses</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Emotional</td>
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<td>21</td>
<td>4.3</td>
</tr>
<tr>
<td>Functional</td>
<td>490</td>
<td>39</td>
<td>8.0</td>
</tr>
<tr>
<td>Physical</td>
<td>490</td>
<td>119</td>
<td>24.3</td>
</tr>
<tr>
<td>Global</td>
<td>1470</td>
<td>179</td>
<td>12.2</td>
</tr>
</tbody>
</table>

*Note.* Global section is defined as a combination of emotional, function, and physical subscales. The rating scale. There was a total frequency score of 179 responses which suggested that 12% of the 49 participants rated their voice with emotional, functional, or physical subscale characteristics. It is important to explore the individual results of the emotional, functional, and physical subscale domains and to address the potential implications.

There was a total of 490 possible responses for the emotional subscale. Each participant scored between 0 and 10 responses. A score of 0 suggested that the participants had no vocal concerns relating to emotional characteristics. A maximum score of 10 suggested the highest concern related to emotional characteristics. There was a total frequency score of 21 responses which revealed that only 4% of the 49 participants rated their voice in the emotional subscale domain. This suggests that emotional characteristics related to voice were low.

There was a total of 490 possible responses for the functional subscale. Each participant scored between 0 and 10 responses. A score of 0 would suggest that the participant had no vocal concerns relating to functional characteristics. A maximum score of 10 suggested the highest concern related to functional characteristics. There was a total frequency score of 39 responses which indicated that only 8% of the 49
participants rated their voice in the functional subscale domain. This suggests that functional characteristics related to voice were also low.

There was a total of 490 possible responses for the physical subscale. Each participant scored between 0 and 10 responses. A score of 0 would suggest that the participants had no vocal concerns relating to physical characteristics. A maximum score of 10 suggested the highest concern related to physical characteristics. There was a total frequency score of 119 responses which indicated that 24% of the 49 participants rated their voice in the physical subscale domain. This suggests that approximately one of four elementary school teachers exhibited physical characteristics related to voice.

The results of the VHI demonstrated that the physical subscale was rated at the highest level of vocal concern while the emotional and functional subscales were not. The results of the VHI provided this investigator with additional insights. Due to the higher responses in the physical subscale domain, physicians and the SLPs to whom they refer should become familiar with the physical components that might be symptomatic of a voice problem. Of interest to this investigator is the fact that the majority of the teacher participants were female. There may be a relationship between physical characteristics and gender. Further study is needed to determine if SLPs should focus on rehabilitative efforts in the physical domain versus the emotional and functional domains in order to measure vocal rehabilitation outcomes and if these characteristics may be gender specific.

In analyzing the prequestionnaires and the postquestionnaires, it was determined that the scores could not be accurately reported as interval level data. Thus, a non-parametric alternative was used in the analysis. Wilcoxon’s matched-pairs signed-ranks test of significance was an alternative to the t-test for related samples. It tested data on at least an ordinal scale and did not require normality of distribution. The test results
demonstrated that there was a significant difference between the scores of the elementary school teachers voice prequestionnaires and the postquestionnaires ($Z = -6.08$, $N = 54$, $p < 0.01$). There was a total of 11 questions created on the prequestionnaires and the postquestionnaires. Table 2 presents a list of the prequestionnaire and postquestionnaire scores of all 54 subjects demonstrating that 48 of the 54 subjects or 89% showed improvement. It should be reported that 3 of the 54 subjects or 5.5% of the subjects scored lower on the postquestionnaire than on the prequestionnaire. The lower scores for subjects 9, 21, and 44 may have been due to lack of attention to task. Another 3 of the 54 subjects or 5.5% of the subjects scored the same on the prequestionnaires and the postquestionnaires. The same scores on both questionnaires for subjects 32, 45, and 47 may have been due to several reasons. Subject 47 had exposure in the speech-language field and reported experiencing voice-related concerns, currently attended voice therapy, and had participated in classes or seminars related to voice. The reason for the same scores for the other two teacher participants may have been due to lack of attention, or they may not have acquired any new skills following the treatment portion of this study.

The Cronbach's Alpha method (e.g., 1 = very likely to 5 = never) was employed. A total of seven questions was used to determine the reliability of the testing instrument. Table 3 presents a list of all questions utilized for this segment of the analysis. The best way to conceptualize Cronbach's Alpha was to consider it as the average of all possible split-half reliabilities for a set of items. The Cronbach Alpha of .88 was statistically significant and it substantiated that this test was a reliable measure.

Questions 12-18 of the postquestionnaire were used in this analysis section to determine if the elementary school teachers found that the instructional videotape was a valuable tool for the professional educator. Table 4 represents the elementary school
Table 2

*Elementary School Teacher Prequestionnaire and Postquestionnaire Scores (N=54)*

<table>
<thead>
<tr>
<th>Subject</th>
<th>Pre</th>
<th>Post</th>
<th>Subject</th>
<th>Pre</th>
<th>Post</th>
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<td>1</td>
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<td>5</td>
<td>11</td>
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</table>

*Note.* The scores for teacher participants 9, 21, and 44 represent that there were lower scores on the postquestionnaire than the prequestionnaire. The scores for teacher participants 32, 45, and 47 represent that the scores were the same for both the prequestionnaire and the postquestionnaire. Teachers' self-ratings on the postquestionnaire using a ranking system for analysis. By using ranking scales 1-5, frequency of responses and percent were reported. The ranking system used for questions 12-15 was defined as 1 = poorly, 2 = fair, 3 = neutral, 4 = well, and 5 = extremely well. The majority of the responses were rated with "well" or
Table 3

*Elementary School Teacher Postquestionnaire Items (N = 54)*

<table>
<thead>
<tr>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. How well did the instructional videotape teach how voice is produced?</td>
</tr>
<tr>
<td>13. How well did the instructional videotape teach how teachers misuse or overuse their voices?</td>
</tr>
<tr>
<td>14. How well did the instructional videotape teach you how to recognize voice stress?</td>
</tr>
<tr>
<td>15. How well did the instructional videotape teach you how to prevent voice problems?</td>
</tr>
<tr>
<td>16. Would this instructional videotape be a useful preventative tool for increasing awareness of vocal misuse for elementary school teachers?</td>
</tr>
<tr>
<td>17. How likely is it that you will implement at least one preventative technique described on this instructional videotape?</td>
</tr>
<tr>
<td>18. How likely are you to recommend this instructional videotape to other teachers?</td>
</tr>
</tbody>
</table>

"extremely well." The combined rating of "well" and "extremely well" was 97%. This suggests that the subjects found this instructional videotape taught "well" or "extremely well" how voice was produced, how teachers misuse or overuse their voices, how to recognize voice stress, and how to prevent voice problems.

The ranking system used for question 16 was defined as 1 = not useful, 2 = somewhat useful, 3 = neutral, 4 = useful, and 5 = very useful. All the responses were rated "useful" or "very useful." The combined rating of "useful" or "very useful" was 100%. This suggests that the subjects found this instructional videotape was a "useful" or a "very useful" preventative tool for increasing awareness of vocal misuse for the elementary school teacher.

The final ranking system used for questions 17 and 18 was defined as
Table 4

Elementary School Teacher Rating of the Instructional Videotape for Analysis on the Voice Postquestionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>Scale</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
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<td></td>
</tr>
<tr>
<td>Frequency</td>
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<td>1</td>
</tr>
<tr>
<td>Percentage</td>
<td>0</td>
<td>1.9</td>
</tr>
<tr>
<td>14</td>
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<td></td>
</tr>
<tr>
<td>Frequency</td>
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<td>0</td>
</tr>
<tr>
<td>Percentage</td>
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</tr>
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<td>15</td>
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<td>Frequency</td>
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<td>0</td>
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<tr>
<td>Percentage</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Percentage</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Percentage</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Percentage</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Note. Judgments were made on 5-point scales. Questions 12-15, Scale 1 = poorly to 5 = extremely well. Question 16, Scale 1 = not useful to 5 = very useful. Questions 17-18, Scale 1 = never to 5 = very likely. 1 = never, 2 = not likely, 3 = neutral, 4 = likely, and 5 = very likely. The majority of the responses were rated “likely” or “very likely.” The combined rating of “likely” or “very likely” was 92%. This suggests that the subjects “would likely” or “very likely”
implement at least one preventative technique described in this videotape as well as “likely” or “very likely” recommend this instructional videotape to others.

Two levels of Kirkpatrick’s (1994) model were used as a guide in this research to rate the elementary school teacher participants’ reactions to this instructional videotape and behavioral or attitudinal changes following the viewing of the videotape. By incorporating Kirkpatrick’s model, questions 12-16 were used to analyze the subjects’ reactions to the instructional videotape. The vast majority of the teacher participants answered questions 12-16 by using the ranking system of “well” and “extremely well.” The teacher participants’ reactions to how well this instructional videotape performed were favorable. Questions 17 and 18 analyzed subjects’ behavioral changes following the viewing of the videotape. The vast majority of the teacher participants answered questions 17 and 18 using a ranking system. The subjects reported that they were “likely” or “very likely” to implement at least one preventative technique described on the videotape and to recommend this videotape to other teachers. Of special interest to this investigator was the fact that 100% of the subjects responded that this instrument was a “useful” or a “very useful” preventative tool for increasing awareness of vocal misuse.

*Expected outcomes of SLPs.* Step 3 of the process consisted of the administration of a voice needs assessment questionnaire to school-based SLPs. The outcome projected for this segment of the study was met. A voice needs assessment questionnaire was used as a screening device to select elementary school-based SLPs who acted as expert-raters in this study. In order to determine expert-rater qualification, a voice needs assessment questionnaire was administered to school-based SLPs who volunteered to participate. In order to qualify as an expert-rater, each SLP was required to have a minimum of one year of experience in the speech-language pathology field and a self-rating on the SLPs’ voice
needs assessment questionnaire of satisfactory or better in the identification, evaluation, and treatment of communication disorders. Eighty-five SLPs completed the voice needs assessment questionnaire. Of those 85 participants, 18 or 21% did not meet the criteria established for qualification. Sixty-seven or 79% of the SLPs qualified to participate in this research project based on the results of the voice needs assessment questionnaire.

Step 4 consisted of the SLPs viewing the instructional videotape and immediately completing a voice postquestionnaire. The outcome projected for this segment of the study was met. Following the SLPs district-wide meeting, 116 SLPs volunteered to participate in the implementation segment of this research. Each participant viewed the instructional videotape and completed the voice postquestionnaire. Of 116 SLPs who completed the implementation phase of the research, only 23 or 20% of them completed the voice needs assessment questionnaire. The voice needs assessment questionnaire was the tool to establish criteria for participation. Therefore, a total of 93 SLPs were excluded from this study because the majority of them did not complete the voice needs assessment questionnaire. Only 23 SLPs qualified for inclusion of data in the analysis of this applied dissertation.

The Cronbach’s Alpha Method (e.g., 1 = very likely to 5 = never) was employed to examine the reliability component. A total of nine questions was used in this analysis to determine the reliability of the testing instrument. Table 5 presents a list of all questions utilized for this segment of the analysis. The best way to conceptualize Cronbach’s Alpha was to consider it as the average of all possible split-half reliabilities for a set of items. The Cronbach Alpha of .84 was statistically significant and it substantiated that this test was a reliable measure.

Questions 1-9 of the postquestionnaire were used in this analysis section to
Table 5

SLP Postquestionnaire Items (N = 23)

<table>
<thead>
<tr>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How well did the instructional videotape teach how voice is produced?</td>
</tr>
<tr>
<td>2. How well did the instructional videotape teach how elementary school teachers misuse or overuse their voices?</td>
</tr>
<tr>
<td>3. How well did the instructional videotape teach elementary school teachers how to recognize voice stressors?</td>
</tr>
<tr>
<td>4. How well did the instructional videotape teach elementary school teachers how to prevent voice problems?</td>
</tr>
<tr>
<td>5. Would this instructional videotape be a useful preventative tool for increasing awareness of vocal misuse for elementary school teachers?</td>
</tr>
<tr>
<td>6. Would this instructional videotape be a useful preventative tool for increasing awareness that vocal remediation (help) is available for elementary school teachers?</td>
</tr>
<tr>
<td>7. Would this instructional videotape be a useful preventative tool for teachers who are new to the profession?</td>
</tr>
<tr>
<td>8. How likely is it that teachers will implement at least one preventative technique described on this instructional videotape?</td>
</tr>
<tr>
<td>9. How likely are you to recommend this instructional videotape to teachers?</td>
</tr>
</tbody>
</table>

determine if the SLPs found that the instructional videotape was valuable for the professional educator. Table 6 represents the SLP participants’ ratings on the postquestionnaire using a ranking system for analysis. By using ranking scales 1-5, frequency of responses and percent were reported. The ranking system used for questions 1-4 was defined as 1 = poorly, 2 = fair, 3 = neutral, 4 = well, and 5 =
### Table 6

**SLP Rating of the Instructional Videotape for Analysis on the Voice Postquestionnaire**

<table>
<thead>
<tr>
<th>Question</th>
<th>Scale</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
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</tr>
<tr>
<td>Percentage</td>
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</tr>
<tr>
<td>2</td>
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<td></td>
</tr>
<tr>
<td>Frequency</td>
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</tr>
<tr>
<td>Percentage</td>
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<td>100</td>
</tr>
<tr>
<td>3</td>
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<td></td>
</tr>
<tr>
<td>Frequency</td>
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<td>23</td>
</tr>
<tr>
<td>Percentage</td>
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<td>100</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>0 0 2 12 9</td>
<td>23</td>
</tr>
<tr>
<td>Percentage</td>
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</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>0 0 0 6 17</td>
<td>23</td>
</tr>
<tr>
<td>Percentage</td>
<td>0 0 0 26.1 73.9</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
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<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>0 0 0 6 17</td>
<td>23</td>
</tr>
<tr>
<td>Percentage</td>
<td>0 0 0 26.1 73.9</td>
<td>100</td>
</tr>
<tr>
<td>7</td>
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<tr>
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</tr>
<tr>
<td>Percentage</td>
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<td>100</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
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<td>23</td>
</tr>
<tr>
<td>Percentage</td>
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<td>100</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>0 0 0 7 16</td>
<td>23</td>
</tr>
<tr>
<td>Percentage</td>
<td>0 0 0 30.4 69.6</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note. Judgments were made on 5-point scales. Questions 1-4, Scale 1 = *poorly* to 5 = *extremely well.* Questions 5-7, Scale 1 = *not useful* to 5 = *very useful.* Questions 8-9, Scale 1 = *never* to 5 = *very likely.*
extremely well. The majority of the responses were rated "well" or "extremely well."

The combined rating of "well" and "extremely well" achieved 98%. This suggests
that the SLPs found that this videotape taught the elementary school teachers "well" or
"extremely well" how voice was produced, how teachers misuse or overuse their
voices, how to recognize voice stressors, and how to prevent voice problems.

The ranking system for questions 5-7 was defined as 1 = not useful, 2 = somewhat
useful, 3 = neutral, 4 = useful, and 5 = very useful. All responses were rated "useful" or
"very useful." The combined rating of "useful" or "very useful" was 100%. This
suggests that all SLP participants found this instructional videotape was "useful" or
"very useful" as a preventative tool for increasing awareness of misuse and that vocal
remediation was available for elementary school teachers and new teachers to the
profession.

The final ranking system for questions 8 and 9 was defined as 1 = never, 2 = not
likely, 3 = neutral, 4 = likely, and 5 = very likely. The majority of the responses were
rated "likely" or "very likely." The combined rating of "likely" or "very likely" was
94%. This indicates that all SLP participants found that the elementary school teachers
would "likely" or "very likely" implement at least one preventative technique described
in this instructional videotape as well as recommend the instructional videotape to
elementary school teachers.

Two levels of Kirkpatrick's (1994) model were used as a guide in this research to
rate the SLP participants' reactions to this instructional videotape and behavioral or
attitudinal changes following the viewing of the videotape. By incorporating
Kirkpatrick's model, questions 1-7 were used to analyze the SLP participants'
reactions to the instructional videotape. The vast majority of the subjects answered questions 1-7 using the ranking system of "well" or "extremely well" and "useful" or "very useful." The SLP participants' reactions to how well this instructional videotape performed as a vocal preventative tool were favorable. Questions 8-9 analyzed the subjects' behavioral changes following the viewing of the videotape. The vast majority of the subjects answered questions 8-9 using a ranking system. The SLP participants reported that teachers would "likely" or "very likely" implement at least one preventative technique described on the videotape and recommend this videotape to other teachers. Of special interest to this investigator was the fact that 100% of the SLP participants responded that this instructional videotape was a "useful" or a "very useful" preventative tool for increasing awareness of vocal misuse.

This applied dissertation investigated whether a videotape would be of value for the elementary school teacher. The data demonstrated that the elementary school teachers found this videotape increased awareness of vocal misuse and overuse and that help was available. The SLPs who served as expert-raters further substantiated that this videotape acted as an effective vocal preventative tool. Although this investigator's applied dissertation holds merit, it is of importance to identify limitations of this study.

Limitations of the Study

Experimental or descriptive design. Did the instructional videotape actually cause the elementary school teachers to increase awareness that vocal problems existed and that remediation was available? Would an experimental design have been a more effective design? An experimental design would have enabled the researcher to determine the cause and effect relationship among variables. If two groups of elementary school
teachers were selected where group A would have received treatment and group B would have received no treatment, this investigator could have assessed improvement based on the prequestionnaire and the postquestionnaire scores. It would have been surmised that Group B would not have shown a change between pretest scores and posttest scores. If learning took place Group A would have shown an improvement in test scores following treatment. An experimental design was not feasible because this investigator could not have included random selection and assignment of the participants. In addition, an experimental study would not have been practical regarding time requirements for this applied dissertation.

Requirements for obtaining participants for this study. The time element was an important factor in the determination of this investigator’s research topic and implementation plan. In order to collect a sample population of of participants for this applied dissertation, it was surmised that the county public school district would be the best option. This involved a tedious process to gain IRB approval for the use of human subjects. In addition, this investigator was required to complete a separate research application in order to utilize subjects from this county’s public school district. Upon written approval, this investigator was also required to obtain a picture identification badge and to be fingerprinted. This process was timely and costly. The entire process took approximately six months.

Obtaining elementary school teacher participants. This investigator determined that a county public school district was an appropriate setting where multiple participants could be acquired for this research. Once the county application was approved, this investigator needed to submit individual letters to principals at select schools in this county’s district to obtain permission to initiate this research. Duplicate letters were
submitted to each of the schools in an attempt to obtain permission from as many of the school principals as possible. This was a very time consuming process. Once the principals at selected schools approved teacher participation, a relationship needed to be established for assistance to include the teachers in this research. The potential elementary school teacher participants had to volunteer for participation prior to determining if they met the criterion for subject participation.

*Obtaining SLP participants.* Approval from the Curriculum Specialist of the Speech-Language & Physically Impaired Programs was necessary prior to obtaining potential SLP participants. Once approval was granted, this investigator obtained several educational professionals to assist in the dissemination of the SLP voice needs assessment questionnaire to promote participation in this study. Due to the limited SLP voice needs assessment questionnaires that were completed and returned to this investigator, it was agreed by the curriculum specialist and this investigator that additional questionnaires would be disseminated during the county-wide district meeting. Although this was significantly helpful, once again it was time consuming.

*Preparation of pretesting, testing, and treatment tools.* To obtain elementary school teacher and SLP participants, this investigator created two voice needs assessment questionnaires. For the initial portion of the implementation process an elementary school teachers’ voice prequestionnaire was created. Two voice postquestionnaires were also constructed for the elementary school teachers and the SLPs. This investigator needed to ensure that all questions included on the questionnaires were adequate for determining criteria for the participants, were appropriate for establishing a baseline for the elementary school teachers, and were effective for establishing learning following the treatment. The creation of these questionnaires took approximately 14 months to
complete. This investigator needed to complete the literature search, determine what questions would be essential to determine criteria, and to assess potential learning post treatment.

The entire processing time to create, edit, and produce the instructional videotape was considerably more time than anticipated. Prior to creating the script, this investigator had to determine the potential causes of vocal misuse and vocal overuse of the elementary school teachers by conducting an extensive literature review. Multiple script revisions were necessary to obtain the information that was vital to answer the question proposed in this research, "Would a professionally designed instructional videotape help elementary school teachers increase their awareness that vocal misuse and vocal overuse existed and that remediation was available." This investigator interviewed and selected the appropriate professionals to participate in the creation of the instructional videotape. These professionals included a producer, videographer, editor and post-production editor, host, medical illustrator, physicians, teachers, massage therapist, and other actors. Copyright permission was attained from select professionals to incorporate voice-overs of individuals with voice problems. Scheduling the videotape shoots was challenging and labor intensive. Retakes were necessary to ensure that this investigator had sufficient videotape footage to use in the instructional videotape. Once all the videotape shoots were completed, the investigator transcribed all the videotape contents. Later the investigator chose only those segments that were most effective for the instructional videotape. Numerous meetings were scheduled in the editing process in order for this investigator's vision to become a reality. Post-production edits were required to produce a polished product for finalization. This entire process took this investigator a total time of 21 months.
Implementation of the research for elementary school teachers. This investigator drove to all the participating schools for implementation of the research. Scheduling each school site with the assistant principal and/or SLP for inclusion of this research was a challenge due to the investigator's work schedule and the teachers’ school schedule. In addition, it took several hours of this investigator’s workday to complete the implementation process per school site for each presentation. This included travel time, preparation time, implementation time, and collection of the questionnaires during the implementation of the research.

Implementation of the research for SLPs. Scheduling was a challenge and it was revised on several occasions. It took a half-day of this investigator’s workday to complete the implementation process. There was a total of approximately 300 SLPs at this county’s district meeting. It was unknown to this investigator, how many SLPS would volunteer to participate. The implementation process occurred following the county’s district meeting of all the exceptional student education teachers. A total of 850 professional educators gathered in one large auditorium. Upon completion of this 3 hour meeting, an announcement was made to the SLPs who chose to participate in the research study. This investigator needed to prepare for up to 300 SLPs to participate. To best prepare for such a large group the following equipment was necessary: a multimedia projector, a videocassette recorder (VCR), two speakers, an amplifier, cables, a microphone, and a large reticular screen. The instructional videotape was displayed so that all SLP participants would be able to view it from wherever they were seated in the auditorium. Incentives were offered to increase the SLPs desire to attend this segment of this study. These incentives were used as door prizes from educational companies. Of the 300 possible SLPs, 116 or 39% remained to participate in this research. Due to the
large turnout, this was well worth the scheduling difficulties and preparation time. This investigator also needed to consider travel time, set-up time, implementation time, and collation of questionnaires.

*Replication of the study.* In order to replicate this study several recommendations would be offered by this investigator. All questionnaires would not be more than one page in length in order to reduce potential participant fatigue and to reduce cost. The SLP needs assessment questionnaire would be eliminated and the participant selection criteria questions would be added to the SLP postquestionnaire. This would save significant time and more participants would be considered as subjects in the study. During the SLP implementation portion of this study, only 23 or 20% of the SLPs participated. Ninety-three or 80% of them did not complete the initial needs assessment questionnaire and therefore, were excluded from participation. If the selection criteria questions were included on the postquestionnaires, all the SLPs could have participated in the study. If this were a pilot study, this investigator would have considered including the SLP criteria questions on the postquestionnaire so that many of them would have qualified in this research. However, the time constraints would have prompted too much revision in order to accommodate for this change. It was decided at this juncture to be untimely.

In addition, this investigator would have changed the question types on the questionnaires from open-ended to multiple choice as many tests are formatted in this fashion and are often used in research (Kirkpatrick, 1994). This investigator’s rationale to use open-ended questions was to measure true learning. Open-ended questions represented true learning rather than by chance or guessing correctly. More time for analysis and interpretation is evident for open-ended questions rather than for multiple choice questions.
Cost. This investigator obtained some reduction in fees for creating and producing this instructional videotape. Several professionals that were contracted for this videotape preparation gave this investigator a student discount. The producer waived production charges thereby saving this investigator approximately $5,000.00. The videocassettes and copies of the videotape were donated. The final out-of-pocket expense of this project for videotape shooting, editing, hiring the host, animation and stationary for questionnaires was approximately $9,000.00. This figure did not include and was not limited to the investigator’s interview time, gasoline costs, time with the videographer, time for transcribing and editing. This videotape production was very costly, however, it was hoped that the benefits would outweigh this cost in the future.

Discussion and Implications

It has been established in the literature that teachers utilize their voices significantly more than the general population and that teachers are at higher risk of vocal disorders (Mattiske et al., 1998; Russell et al., 1998; Sala et al., 2000; Sapir, Atias et al., 1990; Smith, Lemke et al., 1998; Vilkman, 2000). Vocal overloading is harmful to the voice and, therefore, many researchers have established that vocal re-education measures are vital to aid in the treatment and the prevention of vocal problems (Gotaas & Starr, 1993; Miller & Verdolini, 1995; Smith, Lemke et al., 1998). This investigator and other researchers (Blaylock, 1999; Carding & Wade, 2000; Comins, 1992; Johnson, 1985; Kaufmann & Johnson, 1991; Sapienza et al., 1999; Simberg et al., 2000) have discussed the importance of vocal preventative measures for teachers who exhibited vocal misuse and vocal overuse. Vocal hygiene programs were often implemented in voice therapy and in voice therapy home programs through the dissemination of written materials, counseling, or support groups (Comins, 1992; Verdolini-Marston et al., 1994; Stemple et
al., 1995). Although there was a plethora of information addressing vocal prevention programs through the dissemination of materials, counseling, and support groups, this investigator found only one journal article, a Master's thesis by Kaufmann and Johnson (1991), addressing the creation of and the benefits of an instructional videotape for teachers.

Because Kaufman and Johnson (1991) paved the way for future research in this area, an instructional videotape was a viable preventative vocal tool. This investigator supported the use of an instructional videotape as a preventative vocal measure. Therefore, this investigator created a state-of-the-art instructional videotape for the elementary school teacher. Briefly the segment titles included 1) How voice is produced, 2) How elementary school teachers can misuse or overuse their voices, 3) What stressors affect vocal health, and 4) What teachers can do to avoid voice problems.

Kaufman and Johnson (1991) found that teachers successfully assessed their own vocal behaviors and provided instruction to their students regarding healthy vocal usage. These authors stated that by providing this instrument to future teachers, it would clearly aid in the prevention of vocal misuse. Kaufman and Johnson reported that, “The project is one example of what can be done to disseminate preventative factors and strategies. It is, however, only a preliminary test of concept. Much ground is left to be plowed to bring prevention models to realization for other vocal risk populations” (p.47). T.S. Johnson’s (personal communication, December 3, 2001) vocal hygiene videotape was successfully implemented in the public schools and in the private practice arena, but was not consistently used. Johnson reported that, unfortunately, no additional research was continued in this area. Research indicates that a vocal preventative program has value, but it has not yet substantiated that an instructional videotape to establish
good vocal hygiene would be a meritorious tool.

The investigator of this applied dissertation has continued research in this vocal prevention area. As reported in this applied dissertation, it was evident that elementary school teachers and SLPs found that a vocal hygiene instructional videotape was a valuable tool to professional educators. This investigator’s instructional videotape has proven to be valuable to elementary school teachers. It could be useful for teachers who are new to the profession as well for students in teacher preparation programs. The challenge would be to distribute this instructional videotape to student interns, new teachers, experienced teachers, and other professional educators.

In this applied dissertation, it was demonstrated that an instructional preventative videotape on good vocal behaviors was valuable for the elementary school teacher. In fact, it was well documented that vocal misuse and vocal overuse among the elementary school teacher population was underestimated and often unrecognized. This further substantiated the need for an instructional vehicle that could help teachers to become aware of their real and potential vocal problems. It could both increase awareness that vocal problems existed and that remediation would be available.

SLPs are qualified to identify, evaluate, and treat individuals with vocal problems. Therefore, to add additional credibility to this study, and using strict criteria to determine which SLPs were eligible to participate, SLPs were selected and served as expert-raters. It was their function to determine and to confirm that such an instructional videotape had value. Following the completion of the postquestionnaire, the SLPs confirmed that the instructional videotape would increase teachers’ awareness of vocal problems and that help was available. Based on the results of the elementary school teacher voice postquestionnaires, it could be surmised that teachers could be proactive by
implementing good vocal hygiene in the classroom. This comes as a direct result of the teachers’ participation in this study and, more specifically, their viewing of the instructional videotape.

To create an instructional videotape that had value, it was important for this investigator to first establish that there was a high prevalence of teachers at risk for vocal problems and that the multiple causes of vocal misuse in the teaching workplace were understood by this investigator. The literature revealed that multiple factors contributed to the vocal problems that elementary school teachers faced. The causes of vocal misuse and vocal overuse among elementary school teachers included and were not limited to noise, classroom environment, excessive talking, contaminants, environmental influences, medical history, but also due to emotional state. Until these factors were determined, this investigator did not have a sound basis for the development of an effective preventative educational tool.

It was documented in the literature that the broad spectrum of the educational system has not widely recognized the need for vocal training tools for teachers. The research suggested that some form of a training tool would be beneficial to professional educators. Perhaps educational or legislative mandates could be valuable in bringing about a safer working environment. Mandatory educational programs, supplemented by staff speech and language pathologists, could offer support as an initial step in preventative vocal training. At a later time, vocal hygiene programs could be added to the school curriculum.

Researchers have suggested many useful models for the prevention of vocal impairments. Among various forms of vocal hygiene training methods, an instructional videotape has the capability of reaching a larger target audience than individual treatment
in a clinical setting. Future and experienced teachers, with existing or potential vocal problems, could benefit from such a program, regardless of whether or not they had therapeutic intervention in the past. A professionally designed instructional videotape has the potential of promoting good vocal hygiene to a national and perhaps, even an international audience. How then could such an instructional tool be distributed to benefit a larger population? One method is direct distribution by a school district.

Immediately following the implementation of this study the curriculum specialist of the district where this study was conducted stated that this videotape was a valuable resource for the teachers. It was requested that this videotape be presented annually commencing in May of 2003. This presentation would take the form of a broadcast series on the instructional television network of this county’s public school district. In addition, all new teachers would view this videotape during the annual district-wide meetings. The viewing of this instructional videotape would reach a significant number of teachers and other professionals who use their voice as a primary tool of their profession.

Recommendations

Upon completion of this study there are many recommendations that could be made to further explore the use of an instructional videotape in a variety of populations and settings. Many questions remain unanswered and should be investigated with continued research in this area via the use of instructional videotapes to develop good vocal hygiene habits.

1. A larger sample population could be beneficial to further examine an instructional videotape as a vocal hygiene tool for teachers.

2. The utilization of this instructional videotape at the start of each school year could remind teachers about vocal problems and possibly help them seek medical attention.
3. This instructional videotape could be provided to college professors in training programs so that future teachers could become aware of potential vocal problems.

4. The instructional videotape could be used as a means to collect further data on teacher absenteeism, reduced medical leave, and teacher attrition.

5. Medical insurance companies could be contacted to include such a videotape as a preventative health option at the local, state, and national levels.

6. All levels of professional educators from a variety of settings (e.g., middle school, high school, and university levels) could benefit from an instructional videotape.

7. Other high volume voice users (e.g., singers, salesmen, aerobic instructors, on-air personalities, public speakers) are also at risk for voice problems. These professionals could also benefit from an instructional videotape specifically produced for their respective professions to increase their awareness of potential vocal problems.

8. Physicians and SLPs could become familiar with the physical components that might be symptomatic of a voice problem. Based on the results of the VHI, further study is needed to determine if rehabilitative efforts should be focused more toward the physical domain rather than the emotional and the functional domains.

9. There may be a relationship between physical characteristics and gender as reported on the VHI. Since the elementary school teacher population is a highly female dominated group, further exploration is needed to measure if physical domains may be gender specific.

**Dissemination**

On October 18th, 2002, as partial fulfillment of this applied dissertation, this investigator completed two formal presentations at this county's public school district. This investigator was invited to share the doctoral research findings with elementary
school teachers. The presentations were successfully completed and well received with positive feedback that included requests for annual presentations at this county's public school district. The teachers themselves were pleased that there was recognition of this problem and that a tool was created to address this need. In order to further disseminate this tool and research findings, this investigator submitted a proposal for presentation of this research at the FLASHA 2003 Annual Convention.

It is well documented that elementary school teachers, as professional voice users, are more prone to vocal misuse and vocal overuse than the general population. It was substantiated that this instructional videotape on vocal hygiene would be an effective means of creating vocal awareness in the elementary school teacher population and that vocal prevention is available. It is, therefore, incumbent upon the speech-language pathology profession to disseminate this information in the most efficacious manner and to explore the on-going benefits of an instructional videotape for vocal hygiene prevention. It is the intention of this investigator to both continue research in the area of vocal prevention and to implement the findings of this dissertation to a wider audience.
References


Appendix A

Principal Letter
NOVA SOUTHEASTERN UNIVERSITY
Fischler Graduate School of Education and Human Services
Programs in Communication Sciences and Disorders (CSD)
1750 NE 176th Street
North Miami Beach, Florida 33162-3017

December 15, 2002

Principal
Elementary School
Address
City, State, Zip Code

Dear Principal:

As a doctoral student from Nova Southeastern University, the Broward County Public School District has granted me permission to conduct my doctoral research project in the district schools. Being a person with advanced degrees, you know how important research findings can be and the importance of participating in research studies. I would like to share with you my purpose of this research, outline the operational steps to be performed by your teachers, and list the benefits.

**Purpose**
Vocal misuse is evident with teachers, often placing them at high risk for vocal problems. The purpose of this study is to determine whether teachers in the South Florida area are at risk for vocal problems, along with establishing whether a preventative tool, in the form of professionally produced instructional videotape, will increase awareness of vocal misuse among teachers.

**Operational Steps**
In the first segment, kindergarten through fifth grade teachers who consent to participate will complete a “Voice Needs Assessment Questionnaire;” this will take approximately ten minutes to complete. The last segment will be conducted at your school during teacher planning week in August 2002 or in September 2002. Teachers will take a short prequestionnaire, observe the videotape and complete a postquestionnaire. This will take approximately 30 minutes.

**Benefits to Your Teachers**
1. Assisting elementary school teachers to increase awareness that vocal problems exist and that remediation is available.
2. Teachers may realize, through introspection, that they have voice problems.
3. Teachers may pursue medical evaluation to determine if, indeed, a voice problem exists.
4. If so, this could result in preventing vocal misuse, reducing potential medical costs and concomitant absenteeism.
5. The study could provide additional clinical contributions in an area where preventative measures are scarce.
6. Following statistical analysis, we may find this videotape to be of value to use as a resource to help teachers increase awareness of vocal problems.
7. This county’s public school district will be presented with a copy of the findings from the study along with videotape.

**Principal’s Role**
Following your approval for teachers to participate in this study, I will mail the questionnaires
to you or designated professional. Please have them distributed at a faculty meeting or in the teachers’ mailboxes. Teachers will put the completed questionnaires in a large envelope that will be placed in the school office. This envelope will be returned to me at my expense. Before September or August, whichever you choose, I will contact you to schedule the videotape viewing by your teachers. I will be present to manage all parts of the final session.

Again, I respectfully request that you permit your teachers to participate in this worthy study. If I can answer any further questions, please feel free to contact me by phone at (561) 367-1054 or by e-mail at smberlinger@mindspring.com.

Cordially yours,

Susan Berlinger-Schwartz, MS, CCC, SLP
Certified Speech & Language Pathologist
Doctoral Student, Nova Southeastern University
Appendix B

Elementary School Teacher Voice Needs Assessment Questionnaire
Elementary School Teacher
Voice Needs Assessment Questionnaire

*Date: ____________________________  *School: ____________________________
*Name: ____________________________  *DOB: ____________________________
*Phone: ____________________________  *Grade/Subject: ____________________________
*I have been a teacher for ______ year(s).  *Sex: ______ Male ______ Female
(*) Required Information

Directions: There will be a variety of rating scales to which you should respond. Please read each question and rating scale method used before responding. Thank you for taking the time to complete this questionnaire.

The below questions deal with your perception of your voice and vocal history.

1. Do you currently have any concerns about your voice? (Check the appropriate response.)
   - Yes  - No  - Do not know

2. If your response is "yes," when did these concerns first occur?
   ______ <1½ years ago  ______ <1 year ago  ______ <1¾ years ago  ______ <2 years ago  ______ <2¾ years ago
   Other: ____________________________

3. If your response to question number 1 is "no" or "do not know," have you ever experienced any of the following?
   - Laryngitis (for 2 weeks or more)  - Loss of voice  - Hoarseness  - Voice spasms
   - Breathiness  - Reduced volume  - Effortful voice  - Run out of breath
   - Tired voice  - Pushing voice out  - Lower speaking voice  - Higher speaking voice
   Other: ____________________________
   Can you sing high notes? ______ Yes  ______ No  
   Can you sing low notes? ______ Yes  ______ No

4. If you said "yes" to question number 1, what do you think caused your voice problem?
   - Excessive talking  - Yelling  - Straining your voice  - Do not know
   Other: ____________________________

5. Do you have any voice concerns when you are not teaching?
   - Yes  - No  - Do not know

6. Do you believe these concerns are work-related?
   - Yes  - No  - Do not know  - Not Applicable

7. Have you missed any work due to your voice problem?
   - Yes  - No  - Do not remember  - Not Applicable

8. Have you received or are you receiving any voice help?
   - Yes  - No  - Not Applicable
9. When you first started teaching, would you have benefited from information on proper voice use?

Yes  No  Do not know

10. Do you think your voice concerns may limit your professional growth as a teacher?

Yes  No  Do not know

11. Have you ever changed your occupation because of your voice concerns?

Yes  No

12. Does your voice concern affect you when you are speaking in a social situation? (e.g., in a restaurant or at a party)

Yes  No  Have not thought about it

13. What voice symptoms did you have in the past or do you have currently? (e.g., P = past, C = current)

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<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
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<tr>
<td>Current</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
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<td>Tired voice</td>
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<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
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<tr>
<td>Run out of breath</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
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<tr>
<td>Reduced volume</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
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<tr>
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<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
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<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
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<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
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<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
</tr>
<tr>
<td>Other:</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
<td>(P) (C)</td>
</tr>
</tbody>
</table>
| Can you sing high notes? Yes  No  Yes  No
| Can you sing low notes? Yes  No  Yes  No

The next series of questions deal with tobacco, alcohol, caffeine, and medications, which may affect vocal quality.

14. Which of the following do you use? (Please check and fill in the appropriate response below.)

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<tr>
<th></th>
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<tr>
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<td></td>
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</tbody>
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<table>
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<th>How much daily?</th>
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</tr>
<tr>
<td>Chocolate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soda</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Medications:
These next questions deal with preventative methods.

15. Would you benefit from an instructional videotape that would provide information about how teachers misuse their voice?
   ______ Yes ______ No ______ Do not know

16. If your answer is "no," why do you believe that an instructional videotape would not be a useful preventative tool for vocal misuse/abuse? (Write below.)

   ____________________________________________________________

17. If "yes" or "do not know," would you benefit from an instructional videotape that included information and techniques to reduce vocal misuse/abuse?
   ______ Yes ______ No ______ Do not know

18. Has this questionnaire raised your level of awareness of vocal misuse/abuse for the teacher?
   ______ Yes ______ No

19. Has this questionnaire made you aware that help is available?
   ______ Yes ______ No

Your comments about this questionnaire are very important. Please take the time to make whatever comments you feel are appropriate.

Comments:

   ____________________________________________________________

Thank you again for completing this questionnaire.
Appendix C

SLP Voice Needs Assessment Questionnaire
Speech & Language Pathologist (SLP) Voice Needs Assessment Questionnaire

Date: __________________ School: __________________
DOB: __________________ Name: __________________
Phone: __________________ I have been an SLP for __________ years.
Current Responsibilities: __________________

Directions: There will be a variety of rating scales to which you should respond. Please read each question and rating scale method used before responding. Thank you for taking the time to complete this questionnaire.

The following questions deal with your experience conducting voice evaluations and treatment.

1. Have you evaluated and/or treated individuals with voice problems?
   - Yes  - No  - Do not know

2. How many years of experience do you have in the evaluation and treatment of individuals with vocal pathology?
   - 1-2  - 2-5  - 5+  - Not applicable

3. In the last 12 months, approximately how many voice client/patients have you evaluated/treated?
   Evaluated Number: __________
   Adults: __________
   Children: __________
   Treated Number: __________
   Adults: __________
   Children: __________

4. Rate your competency level in the identification of voice problems.
   1  2  3  4  5
   Superior  Above Average  Average  Below Average  No level of Competency

5. Rate your competency level in conducting a voice evaluation.
   1  2  3  4  5
   Superior  Above Average  Average  Below Average  No level of Competency

6. Rate your competency level in preparing and executing voice treatment.
   1  2  3  4  5
   Superior  Above Average  Average  Below Average  No level of Competency

The next series of questions deal with preventative measures.

7. Could teachers benefit from specific strategies and exercises to reduce vocal misuse/abuse?
   - Yes  - No  - No opinion

8. Could teachers benefit from an instructional videotape that provides information about how they can misuse/abuse their voices?
   - Yes  - No  - No opinion
9. Could teachers benefit from an instructional videotape that would increase their awareness of vocal misuse/abuse?
   Yes □ No □ No opinion □

10. Could teachers benefit from an instructional videotape that includes preventative measures to reduce vocal misuse/abuse?
    Yes □ No □ No opinion □

11. Would you consider using an instructional videotape addressing preventative measures for your clients being treated for vocal problems?
    Yes □ No □ No opinion □

12. Would a training manual be an important feature to be included with this instructional videotape on vocal prevention?
    Yes □ No □ No opinion □

13. Do you think such an instructional videotape could prevent clients/patients from regressing and/or returning for additional voice treatment?
    Yes □ No □ No opinion □

14. Do you think an instructional videotape could act as a preventative tool for newly hired teachers?
    Yes □ No □ No opinion □

15. Do you think an instructional videotape could act as a preventative measure for seasoned teachers?
    Yes □ No □ No opinion □

16. Would you be interested in obtaining this instructional videotape for your library?
    Yes □ No □ No opinion □

17. Has this questionnaire raised your level of awareness of vocal misuse/abuse for the teacher?
    Yes □ No □

18. Has this questionnaire made you aware that a preventative tool could be helpful for teachers who have never received voice treatment?
    Yes □ No □

19. Has this questionnaire made you aware that a preventative tool could be helpful for teachers who have received voice treatment in the past?
    Yes □ No □

Your comments about this questionnaire are very important. Please take the time to make whatever comments you feel are appropriate. Use the back of this page for additional writing space.

Comments:

Please send this questionnaire through the courier system to Dorothy Coney, KC Wright Building, 9th floor. Thank you again for completing this questionnaire.
Appendix D

Instructional Videotape Script
Instructional Videotape Script

How to Use Good Vocal Behaviors in the Classroom

The prologue of this instructional videotape included excerpts of teachers using their voices in a variety of settings. A title page has been included stating: This instructional videotape was created in partial fulfillment of the requirements for the Degree of Doctor of Speech-Language Pathology by Susan Berlinger-Schwartz. The instructional videotape was titled, “How to Use Good Vocal Behaviors in the Classroom,” and displayed following the introduction. An interview segment of a group of teachers was included in this instructional videotape to obtain a more representative sampling of voice concerns of the elementary school teacher. Four teachers briefly discussed their different voice concerns, with one interview fading into another.

Script

Host

Hi, my name is Jackie Bales. As teachers, you use your voice constantly throughout the workday, which can lead to vocal misuse and vocal overuse. Teachers experience voice problems more than the general population. Vocal misuse and vocal overuse place teachers at high risk for voice problems. The purpose of this videotape is to help elementary school teachers recognize and prevent voice problems.

Host

We’ll discuss:

1. How voice is produced,

2. How elementary school teachers can misuse or overuse their voices,

3. What stressors affect vocal health,

4. What you can do to avoid voice problems.
Narrator

How do we produce voice?

Narrator

Voice is sound that comes from our larynx or the “voice box.” When we inhale, our lungs fill up with air. The air travels up through the windpipe, and gently blows apart the vocal cords. This creates a vibration of the vocal cords and sound is produced.

Narrator

Healthy vocal cords look like this. The vocal cords are muscles, just like any muscles they can become overworked and overused. Excessive talking, yelling, cheering, throat tension, coughing, and throat clearing can contribute to vocal problems.

Narrator

Let’s hear from Dr. Carolyn Agresti who will describe how the vocal cords appear when there is a problem.

Ears Nose and Throat (ENT) Physician

“Vocal cords can become red and swollen. They can show signs of misuse and abuse in which case there are irritations that are thickenings or little bumps also known as vocal cord (VC) nodules. VC nodules are callous-like thickenings that lead to incomplete closure of the vocal cords which results in loss of air and, therefore, a breathy, hoarse quality to the sound of your voice.”

Teacher

“One day I was reading a story to the class and I tried to make a high pitch voice like a mouse and one of my students in the class said to me, ‘What just happened to your voice because it cut out completely?’”
Narrator

Is laryngitis a serious vocal problem?

ENT

“It’s a very common problem that most people experience one or twice in their lifetime. Symptoms can include hoarseness, scratchiness in your throat, pain when vocalizing, and even difficulty swallowing. I would recommend that you seek medical attention if it is lasting more than two weeks.”

Narrator

How do elementary school teachers misuse or overuse their voices?

Narrator

Raising your voice during lunch, hall, bus, or playground duty, or during field trips can strain your voice. Frequent talking, yelling, ineffective breathing, or clearing the throat are factors that contribute to vocal misuse and overuse.

Narrator

Ask yourself these questions to see if you are misusing your voice.

1. Do you often have hoarseness?

2. Do you ever lose your voice?

3. Do you experience vocal fatigue?

4. Are you ever short of breath?

5. Is it difficult to project your voice to the last row of the classroom?

6. Do your neck muscles feel tight when you strain your voice?

7. Does your voice sound different from the way it used to sound?

8. Do you clear your throat or cough frequently?
Narrator
If you have more “yes” responses than “no” responses, you may be straining or stressing your voice.

Narrator
Doctor Carolyn Agresti will answer some basic questions.

Narrator
What does an Ear, Nose, and Throat doctor do?

ENT
“An Ear, Nose and Throat specialist is a trained surgeon who evaluates people of all ages: pediatric and adults with ear, nose and throat complaints.”

Teacher
“I just don’t have the energy to talk anymore. I just feel like not talking anymore because its almost like it is too much effort to talk.”

Narrator
Who should see an ENT and when?

ENT
“A teacher should see an ear nose and throat specialist from the first signs of voice problems, such as laryngitis, difficulty projecting their voice. The reason not to delay the treatment is because teachers are developing their problems from occupational hazards such as overuse of their voice or overcoming environmental hazards in a classroom without microphones or proper sound systems.”

Teacher
“It seems like say, if you had a loud group, if I could get louder over them. It just seems I gain better control or if I’m reading a book to the kids, I like to really like
to embellish it and add a lot of expression so I’m making the voices. I imagine that I am
straining my voice.”

Narrator

How do voice problems develop?

ENT

“Most voice patients are gregarious people, they like to talk a lot, maybe they scream or
yell out at activities they’re participating in. So, what you want to try to do is take good
care of your voice and try to eliminate at least the behavioral factors that contribute to
voice disorders.”

Narrator

Are there any voice problems that may be due to underlying medical conditions?

ENT

“The first one is gastroesophageal reflux disease also known as GERD. This
relates to people who, for example, may have hiatal hernias or esophagitis in which the
acid comes in reverse from the stomach and esophagus up into the lower throat. Other
people may be diagnosed with laryngopharyngeal reflux by their ENT specialist because
they can usually correlate the voice problem as it relates to the reflux and relate the
development of hoarseness and laryngitis to reflux. The third entity is asthma in which
case patients are prescribed inhalers which cross the vocal cords and what we’ve learned
from inhalation of these steroids is they can cause inflammation of the vocal cords and
therefore cause laryngitis.”

Narrator

Dr. Murata completes the examination of elementary school teacher Ms. Santiago
and finds vocal nodules.
Narrator

Dr. Murata discusses that surgical removal of vocal cord nodules would not be an initial recommendation. He suggests to his patients that that changing vocal behaviors can be helpful. Another option would be for you to see a certified speech-language pathologist. Let’s watch as Ms. Susan Berlinger-Schwartz, a certified speech language pathologist (SLP), discusses with Ms. Santiago the benefits of short-term voice therapy.

SLP

“Here’s an outline of the voice program that I’ve designed for you. Your program is going to consist of increasing your awareness of vocal misuse and we want to identify those behaviors that might cause vocal strain and irritation. Because you run out of breath when you speak, I’ll demonstrate in your first session proper diaphragmatic breath support and voice techniques.”

SLP

“If you feel the need to clear your throat and you expressed to me that you do this quite often in school, I want to teach a technique called the sniff and swallow technique that is very easy to complete. Just take an exaggerated sniff and an immediate swallow. Does that feel better?”

Narrator

What stressors affect vocal health? Let’s look at how we stress our voices. Do you have any of these symptoms?

Narrator

1. Hoarseness or other problems with you voice?
2. Heartburn, indigestion, chest pain or regurgitation?
3. Stomach acids coming up when eating certain foods, for example, caffeine, chocolate,
nuts or spicy foods?

4. Throat mucous or post nasal drip?

5. Breathing difficulties, choking or coughing after lying down?

6. Difficulty swallowing food, liquids or pills?

7. Clearing your throat or an annoying cough?

8. A sensation of a lump in your throat or a sensation of something sticking in your throat?

*Narrator*

Now you decide if your voice sounds like any of these.

*Narrator*

A hoarse voice (female)

*Sample Voice*

"You wish to know about my grandfather. Well, he is nearly 93 years old. He dresses himself in an ancient black frock coat, usually minus several buttons; yet he still thinks as swiftly as ever."

*Narrator*

A hoarse voice (male)

*Sample Voice*

"You wish to know all about my grandfather. Well, he is nearly 93 years old. He dresses himself in an ancient black frock coat, usually minus several buttons; yet he still thinks as as ever."

*Narrator*

A weak voice
Sample Voice

"I see two kids going after a cookie; one about ready to fall off a chair and the mother washing dishes and the sink is overflowing."

Narrator

A strained voice

Sample Voice

"I see the mother washing dishes. The waters overflowing. The little boy is in the cookie jar by the cabinet about to tilt over in the chair. The daughter's laughing and she wants him to hand over a cookie."

Narrator

A breathy voice

Sample Voice

"You wish to know about my grandfather. Well, he is nearly 93 years old. He dresses himself in an ancient black frock coat."

Narrator

If you recognized your voice in any of these examples, you may want to look for ways to eliminate vocal overuse.

Narrator

How does the environment affect your voice?

Narrator

Heat, ventilation, and air-conditioning all can have an effect on your voice. Poor acoustics, classroom size, hard surfaces that reverberate sound, all can contribute to vocal problems. Adding rugs and curtains will absorb energy and help control the environment.
Narrator

Proper storage of chemical products used for such things as cleaning, building, or maintenance ensures that they will not contribute to vocal problems. Proper cleaning of carpeting, ceiling tiles, and ducts ensures that contaminants are eliminated from the environment. Keep outdoor pollutants from entering the building through windows.

Narrator

How do physical stressors affect your voice?

Narrator

1. Age
2. Allergies
3. GERD
4. Laryngopharyngeal reflux
5. Asthma
6. Upper respiratory infections
7. Fatigue
8. Reduced hydration
9. Hormonal changes
10. Drugs
11. Germs caught from students may interfere with your natural voice.

Narrator

Speak to your doctor if you think any of these are contributing to your voice problems.

Narrator

Now that we have discussed voice misuse and vocal overuse, let’s look at things you can do to prevent voice problems.
Narrator

What you can do in the classroom:

1. When you start to speak, use a quiet and gentle voice and remember to vary your pitch.

2. If you run out of breath while speaking, take additional breaths and pause at natural phrasing in the sentence.

3. If you feel tightness in the throat from speaking, attempt to relax it. Try changing your posture.

4. Minimize excessive coughing and clearing of the throat. This repeated action aggravates the vocal cords.

5. Sniff and swallow, or drink water when you have the urge to cough or clear your throat.

6. To help you talk less, use hand, face, or body gestures or consider using a bell.

7. Written instructions or audiovisual equipment can also help.

8. Stand closer to students or walk around the classroom while you talk.

9. Reduce or modify background noises such as air conditioners, outside noise, shuffling papers, or moving chairs.

10. Use portable amplification devices, especially in large auditoriums or cafeterias.

Narrator

What the students can do to help:

1. Share your voice problem with your students. Devise a signal the students can use to remind you that you are clearing your throat. This will help you to stop the behavior and will increase the students’ awareness of voice problems.

2. Use peer teaching, activity centers, small group instruction, and use students
as teachers to help you rest your voice.

_Narrator_

Consulting your doctor:

1. If you are experiencing chronic hoarseness, throat clearing, vocal fatigue, coughing, a sensation of choking or a lump in the throat, consult your doctor to rule out GERD.

2. If you have an upper respiratory infection, a hoarse voice, or laryngitis for more than two weeks, consult your physician.

3. If you take medication, read the package insert regarding drying effects or other vocal problems you may be experiencing. Talk to your doctor if you have any concerns.

_Narrator_

Be kind to your voice:

1. Each day drink at least 8 glasses of water. Herbal teas are effective in reducing vocal irritation.

2. Before you begin your teaching day, consider using some common and quick relaxation exercises such as neck rotation, body stretching, and vocal warm-ups.

3. Some proactive approaches are maintaining good nutrition, exercising, avoiding smoking and second-hand smoke, and limiting alcoholic beverages.

4. If you are having voice problems, limit caffeine, spicy foods, and chemical food additives.

5. Make time for use of the steam room, massage, aromatherapy, and increased hours of sleep to relieve stress.

_Host_

Now that you have seen how voice is produced, how you can misuse or stress your voice, and how you can prevent voice problems, you are on your way to good vocal
health. Choose one preventative measure at a time; get good at it before adding another.

You only have one voice and you need that voice to be healthy for work and play.

Remember, be good to your voice. I'm Jackie Bales.

Special Thanks To

1. Blausen Medical Communications Inc.
2. Broward County Elementary School Teachers
3. Broward County Public School District
4. Broward Education Communication Network (BECON)
5. Carolyn Agresti, M.D. and staff
7. Daniel Boone, Ph.D.
8. Jackie Bales, Host
9. James Murata, M.D., F.A.C.S., and Staff
10. James Paul Dworkin, Ph.D.
11. Joel Schwartz
12. Judith Ross
13. Minds i No Limits, Corp.
14. Bill Horneck, Producer
15. Mikey Atelus, Editor
16. Nova Southeastern University
17. Phillip Voluck
18. Robert J. Meleca, M.D.
19. Saygo Studios, Post-Production
20. Susan Landee

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516-416-4046, smberlinger@mindspring.com
Appendix E

Instructional Videotape Insert
Instructional Videotape Insert: Good Vocal Behaviors in the Classroom

Rationale
This instructional videotape was created in partial fulfillment of the requirements for the Degree of Doctor of Speech Pathology from Nova Southeastern University by Susan Berlinger-Schwartz. This project was to investigate how well a professionally designed instructional videotape would help elementary school teachers increase their awareness that vocal misuse and vocal overuse exists and that remediation is available. This investigator resolved the question by creating, producing, and requesting that the elementary school teachers view this preventative vocal hygiene instructional tool.

Summary
It is well documented that teachers experience vocal pathologies more than the general population. Vocal misuse and vocal overuse is evident with elementary school teachers, high school teachers, university professors, exercise instructors, and other instructional disciplines often placing them at high risk for vocal problems. Elementary school teachers were chosen, as subjects for this applied dissertation because they are high volume voice users with frequent voice use throughout the workday. They are more prone to vocal misuse and vocal overuse because of environmental, occupational, and physical factors. Elementary school teachers use their voices during daily classroom instruction as well as supervising students during other school activities. Lunchroom duty, bus duty, hall duty, and playground duty are often conducted in loud environments which require teachers to raise vocal volume. Coughing, throat clearing, throat discomfort, pitch variation, and elevating vocal volume are common complaints of some teachers. These complaints often result in additional stress to the vocal mechanism which in turn leads to voice changes because of vocal misuse and vocal overuse patterns.

Purpose
This instructional videotape is to help the elementary school teacher recognize and prevent voice problems. It has been designed for the elementary school teacher to use as a preventative vocal hygiene tool. Elementary school teachers that are seasoned, new to the profession, have a history of vocal misuse and vocal overuse, or have had any concerns about voice will benefit from this instructional videotape.

Instructional Videotape
This instructional videotape, Good Vocal Behaviors in the Classroom, will discuss: 1) How Voice Is Produced, 2) How Elementary School Teachers can Misuse or Overuse their Voices, 3) What Stressors Affect Vocal Health, and 4) What Elementary School Teachers Can Do to Avoid Voice Problems.

On-going Research
If you are interested in participating in on-going research, please contact Susan Berlinger-Schwartz at smberlinger@mindspring.com for qualification questionnaire.

Running Time: Approximately 16.45 minutes
Susan Berlinger-Schwartz, MS CCC, SLP
© 2002, August 20th
All Rights Reserved
Good Vocal Behaviors in the Classroom
Appendix F

Elementary School Teacher Voice Prequestionnaire
Elementary School Teacher Voice Prequestionnaire

*Name: *Date: 
(*) Required Information

Teachers, this is a questionnaire, NOT a test. The information will ONLY be used to establish baseline for this research. This data is confidential and will be used expressly for purposes of this study. Please include your name above. Thank you very much for your time and consideration.

Directions for Items A-E
Please explain if you have had any exposure, prior training and/or experience in the speech-language field by checking the appropriate response below.

A. Have you ever seen a professional for any voice-related concern?  
   Yes  No
B. Are you currently seeing a professional for your voice?  
   Yes  No
C. Have you ever participated in any classes or seminars related to voice?  
   Yes  No
D. Have you ever worked or volunteered in the speech-language field?  
   Yes  No
E. If you checked a "yes" for question D, please indicate the length and time of your experience.

Directions for Items 1-11
Below are open-ended questions. Please respond to each item as best that you can. Write your responses in the space provided.

1. Two anatomical structures that are used to produce voice include:

2. Three ways that teachers can misuse or overuse their voices are:

3. Two ways that I misuse or overuse my voice include:

4. One underlying medical condition that may appear as a voice problem is:

5. Two types of professional specialists that can be seen for a voice problem are:

6. One vocal symptom commonly associated with gastroesophageal reflux disease (GERD) is:

7. Two voice symptoms that show vocal stress are:

8. Two elements in my classroom environment that can cause voice problems consist of:

9. Two ways to prevent environmental problems that could affect my voice are:

10. Two ways to prevent misusing or overusing my voice are:

11. Two teaching techniques to minimize voice misuse or overuse consist of:

Comments:

Thank you for taking the time to complete this questionnaire.
Appendix G

Elementary School Teacher Voice Postquestionnaire
Elementary School Teacher Voice Postquestionnaire

*Name: __________________________ *Date: __________________________
(*) Required Information

Teachers, this is a questionnaire, NOT a test. The information will ONLY be used to establish baseline for this research. This data is confidential and will be used expressly for purposes of this study. Please include your name above. Thank you very much for your time and consideration.

Directions for Items 1-11

Below are open-ended questions. Please respond to each item as best that you can. Write your responses in the space provided.

1. Two anatomical structures that are used to produce voice include:

2. Three ways that teachers can misuse or overuse their voices are:

3. Two ways that I misuse or overuse my voice include:

4. One underlying medical condition that may appear as a voice problem is:

5. Two types of professional specialists that can be seen for a voice problem are:

6. One vocal symptom commonly associated with gastroesophageal reflux disease (GERD) is:

7. Two voice symptoms that show vocal stress are:

8. Two elements in my classroom environment that can cause voice problems consist of:


9. Two ways to prevent environmental problems that could affect my voice are:

10. Two ways to prevent misusing or overusing my voice are:

11. Two teaching techniques to minimize voice misuse or overuse consist of:

Directions for Items 12-18
Please indicate your opinion by checking the space next to your preferred responses.

12. How well did the videotape teach how voice is produced?
   - Extremely Well
   - Well
   - Neutral
   - Fair
   - Poorly

13. How well did the videotape teach how teachers misuse or overuse their voices?
   - Extremely Well
   - Well
   - Neutral
   - Fair
   - Poorly

14. How well did the videotape teach you how to recognize voice stress?
   - Extremely Well
   - Well
   - Neutral
   - Fair
   - Poorly

15. How well did the videotape teach you how to prevent voice problems?
   - Extremely Well
   - Well
   - Neutral
   - Fair
   - Poorly

16. Would this videotape be a useful preventative tool for increasing awareness of vocal misuse for elementary school teachers?
   - Very Useful
   - Useful
   - Neutral
   - Somewhat Useful
   - Not Useful

17. How likely is it that you will implement at least one preventative technique described on this videotape?
   - Very Likely
   - Likely
   - Neutral
   - Not Likely
   - Never

18. How likely are you to recommend this videotape to other teachers?
   - Very Likely
   - Likely
   - Neutral
   - Not Likely
   - Never

Directions for Item 19
Below is an open-ended question. Please respond to this item as best that you can. Write your responses in the space provided.

19. Which techniques do you find most useful? (List at least two.)

   ____________________________________________________________
   ____________________________________________________________
Thank you for taking the time to complete this questionnaire.
Appendix H

SLP Voice Postquestionnaire
# SLP Voice Postquestionnaire

**Date**  
**School**

*Name:*  
(*) Required Information

**Directions:** This data is confidential and will ONLY be used expressly for purposes of this research study. Thank you very much for your time and consideration.

---

**Directions for Items 1-9**

Please indicate your opinion by checking the space next to your preferred responses.

1. **How well did the instructional videotape teach how voice is produced?**

<table>
<thead>
<tr>
<th>Extremely Well</th>
<th>Well</th>
<th>Neutral</th>
<th>Fair</th>
<th>Poorly</th>
</tr>
</thead>
</table>

2. **How well did the instructional videotape teach how elementary school teachers misuse or overuse their voices?**

<table>
<thead>
<tr>
<th>Extremely Well</th>
<th>Well</th>
<th>Neutral</th>
<th>Fair</th>
<th>Poorly</th>
</tr>
</thead>
</table>

3. **How well did the instructional videotape teach elementary school teachers how to recognize voice stressors?**

<table>
<thead>
<tr>
<th>Extremely Well</th>
<th>Well</th>
<th>Neutral</th>
<th>Fair</th>
<th>Poorly</th>
</tr>
</thead>
</table>

4. **How well did the instructional videotape teach elementary school teachers how to prevent voice problems?**

<table>
<thead>
<tr>
<th>Extremely Well</th>
<th>Well</th>
<th>Neutral</th>
<th>Fair</th>
<th>Poorly</th>
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</thead>
</table>

5. **Would this instructional videotape be a useful preventative tool for increasing awareness of vocal misuse for elementary school teachers?**

<table>
<thead>
<tr>
<th>Very Useful</th>
<th>Useful</th>
<th>Neutral</th>
<th>Somewhat Useful</th>
<th>Not Useful</th>
</tr>
</thead>
</table>

6. **Would this instructional videotape be a useful preventative tool for increasing awareness that vocal remediation (help) is available for elementary school teachers?**

<table>
<thead>
<tr>
<th>Very Useful</th>
<th>Useful</th>
<th>Neutral</th>
<th>Somewhat Useful</th>
<th>Not Useful</th>
</tr>
</thead>
</table>

7. **Would this instructional videotape be a useful preventative tool for teachers who are new to the profession?**

<table>
<thead>
<tr>
<th>Very Useful</th>
<th>Useful</th>
<th>Neutral</th>
<th>Somewhat Useful</th>
<th>Not Useful</th>
</tr>
</thead>
</table>
8. How likely is it that teachers will implement at least one preventative technique described on this instructional videotape?

____ Very Useful  ____ Useful  ____ Neutral  ____ Somewhat Useful  ____ Not Useful

9. How likely are you to recommend this instructional videotape to teachers?

____ Very Useful  ____ Useful  ____ Neutral  ____ Somewhat Useful  ____ Not Useful

Directions for Item 10-11
Below you will find an open-ended question and a comment section. Please respond to the items as best that you can. Write your responses in the space provided.

10. Name at least one technique in this instructional videotape that you found most useful for teachers?

Comments:

Thank you for taking the time to complete this questionnaire.

Please turn this questionnaire over when you have completed it, place your pen down, and wait for instructions.
Appendix I

Elementary School Teacher Consent Form for Participation
INFORMED CONSENT FORM

Elementary School Teacher Form

Teachers and Vocal Misuse: Increasing Awareness Project

Susan Berlinger-Schwartz, M.S., CCC, SLP
6399 Via Rosa
Boca Raton, FL 33433
(561) 367-1054
Cathleen Bergin, Ed. D., CCC-SLP
Doctoral Advisor
154 West Street
Naples, FL 34108
(941) 649-3394
Institutional Review Board: (954) 262-5369

Description: Vocal misuse is evident with teachers, often placing them at high risk for vocal problems. The purpose of this study is determine whether teachers in South Florida are at risk for voice misuse and to determine if a preventative tool, in the form of a professionally produced videotape, will increase awareness of vocal misuse among teachers. You were asked to participate in this study because you are an elementary school teacher. You will be requested to complete a prequestionnaire which will take no longer than 0.5 hours from instruction to completion. Depending on the results of the questionnaire you may be asked to participate in a second phase of the study. In the second phase you will view the preventative tool videotape and complete a postquestionnaire to determine if this preventative tool increased your awareness of vocal problems with teachers and was of value to you. This second phase is estimated to take no more than 1.5 hours for the participants to complete, and will be conducted on a teacher planning day.

Costs and Payments to the Participant: There is no cost for participation in this study.

Risks/Benefits to the Participants: Preventative tools such as this instructional videotape could provide the initial steps toward assisting teachers to increase awareness that vocal problems exist, and that remediation is available. While completing the questionnaire teachers may realize via introspection that they have voice problems. As a result, these teachers may pursue medical evaluation to determine if indeed a voice problem exists. If so, this could result in reduced vocal misuse and a reduction in potential medical costs. This protocol could provide additional clinical contributions in an
area where preventative measures are scarce. It is hoped that this project could offer another venue for awareness and prevention of vocal misuse in teachers. Vocal misuse prevention tools could have the potential of promoting good vocal hygiene at a local level. A review of the preliminary results of this research will be made available to the participants at the conclusion of the study.

**Risks:** To the best of our knowledge, there are neither physical nor emotional risks associated with the completion of these questionnaires and the observation of a training videotape as intervention beyond those which are ordinarily associated with office work.

**Confidentiality:** Subject confidentiality will be maintained at all times. The names of the subjects will be requested on each questionnaire in order to identify those subjects who will qualify for participation in this study. Questionnaires will be secured in a locked file cabinet when not utilized for analysis. For those participants who do not qualify in this study, their names will be removed from the identifying location on the questionnaire and an ID number will be provided. Only the investigator, advisor, other research staff, and the doctoral committee at Nova Southeastern University may have accessibility to the questionnaires by following all ethical issues regarding confidentiality.

**Participant's Right to Withdraw from the Study:** Participation in this research study is on a voluntary basis for the elementary school teacher. The participants have the right to refuse or withdraw from this project at any time during the course and scope of this study without penalty. For those participants who choose to refuse or withdraw from this project, their data will be destroyed unless there is something on it that must be disclosed by law. Should any participants have questions about their rights or questions about this study, they may contact Susan Berlinger-Schwartz, M.S., CCC, SLP, principal investigator at (561) 367-1054, Cathleen Bergin Ed. D., CCC-SLP, doctoral advisor at (941) 649-3394 or the Institutional Review Board at (954) 262-5369.

**Voluntary Consent:** I have read this consent form and I fully understand the contents of this document and I voluntary consent to participate. All of my questions concerning this research have been answered. If I have any questions in the future about this study they will be answered by the investigator listed above, her advisor or IRB representative. A copy of this form has been provided to me.

**Other Considerations:**
It is my understanding that if significant new information relating to this study is identified, the investigator listed above, or her advisor will inform me.

<table>
<thead>
<tr>
<th>Signature of Participant</th>
<th>Date</th>
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</table>

| Signature of Witness | Date |
I request a copy of a summary of the researchers findings to be sent to me at the following address once this project is completed.

<table>
<thead>
<tr>
<th>Signature of Participant</th>
<th>Date</th>
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<table>
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<tr>
<th>Signature of Witness</th>
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</table>
Appendix J

SLP Consent Form for Participation
INFORMED CONSENT FORM

Speech and Language Pathologist Form

Good Vocal Behaviors in the Classroom

Susan Berlinger-Schwartz, M.S., CCC, SLP
6399 Via Rosa
Boca Raton, FL 33433
(561) 367-1054

Cathleen Bergin, Ed. D., CCC-SLP
Doctoral Advisor
154 West Street
Naples, FL 34108
(941) 649-3394

Institutional Review Board: (954) 262-5369

Description: Vocal misuse and vocal overuse is evident with teachers, often placing them at high risk for vocal problems. The purpose of this study is determine whether teachers in South Florida are at risk for voice misuse and to determine if a preventative tool in the form of a professionally produced instructional videotape will increase awareness of vocal misuse among teachers. You were asked to participate in this study as expert raters because you are speech language pathologist (SLP) professionals skilled in the identification of communication disorders. You will be requested to complete a voice needs assessment questionnaire which will take no longer than 0.25 hours from instruction to completion. Depending on the results of the questionnaire you may be asked to participate in a second phase of the study. In the second phase you will view the instructional videotape and complete a postquestionnaire to determine if this preventative tool will increase teachers awareness of vocal problems and would be a value to them. This second phase is estimated to take no more than 0.5 hours for the participants to complete, and will be conducted during the school year.

Costs and Payments to the Participant: There is no cost for participation in this study.

Risks/Benefits to the Participants: Preventative tools, such as this instructional could provide the initial steps toward assisting teachers to increase awareness that vocal problems exist and that remediation is available. It may help school SLPs assist local staff in recognition of voice problems at their own school. It may also provide a means to help school SLPs do informal screens with their faculty members. This protocol could provide additional clinical contributions in an area where preventative measures are
scarce. It is hoped that this project could offer another venue for awareness and prevention of vocal misuse and vocal overuse among teachers. Vocal misuse and vocal overuse could have the potential of promoting good vocal hygiene at a local level. A review of the preliminary results of this research will be made available to the participants at the conclusion of the study if requested.

**Risks:** To the best of our knowledge, there are neither physical nor emotional risks associated with the completion of these questionnaires and the observation of an instructional videotape as intervention, beyond those which are ordinarily associated with office work.

**Confidentiality:** Subject confidentiality will be maintained at all times. The names of subjects will be requested on each questionnaire in order to identify those subjects who will qualify for participation in this study. Questionnaires will be secured in a locked file cabinet when not utilized for analysis. For those participants who do not qualify in this study, their names will be removed from the identifying location on the questionnaire and an ID number will be provided. Only the investigator, advisor, other research staff, and the doctoral committee at Nova Southeastern University may have accessibility to the questionnaires by following all ethical issues regarding confidentiality.

**Participant’s Right to Withdraw from the Study:** Participation in this research study is on a voluntary basis for the SLP. The participants have the right to refuse or withdraw from this project at any time during the course and scope of this study without penalty. For those participants who choose to refuse or withdraw from this project, their data will be destroyed unless there is something on it that must be disclosed by law. Should any participants have questions about their rights or questions about this study, they may contact Susan Berlinger-Schwartz, M.S., CCC-SLP, principal investigator at (561) 367-1054, Cathleen Bergin Ed. D., CCC-SLP, doctoral advisor at (941) 649-3394 or the Institutional Review Board at (954) 262-5369.

**Voluntary Consent:** I have read this consent form and I fully understand the contents of this document and I voluntary consent to participate. All of my questions concerning this research have been answered. If I have any questions in the future about this study they will be answered by the investigator listed above, her advisor or IRB representative. A copy of this form has been provided to me.

**Other Considerations:**
It is my understanding that if significant new information relating to this study is identified, the investigator listed above or her advisor will inform me.

<table>
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<tr>
<th>Signature of Participant</th>
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<table>
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<tr>
<th>Signature of Witness</th>
<th>Date</th>
</tr>
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</table>
I request a copy of a summary of the researchers findings to be sent to me at the following address once this project is completed.

________________________________________

________________________________________

Signature of Participant                      Date

________________________________________

Signature of Witness                         Date
Appendix K

Voice Handicap Index (VHI)
Voice Handicap Index (VHI)

Instructions

This is the Voice Handicap Index (Jacobson, Johnson, Grywalski, Silbergleit, Jacobson, Benninger & Newman (1977). These are statements that many people have used to describe their voices and the effects of their voices on their lives. Circle the response that indicates how frequently you have the same experience.

1. My voice makes it difficult for people to hear me.
2. I run out of air when I talk.
3. People have difficulty understanding me in a noisy room.
4. The sound of my voice varies throughout the day.
5. My family has difficulty hearing me when I call them throughout the house.
6. I use the phone less often than I would like.
7. I tense when talking with others because of my voice.
8. I tend to avoid groups of people because of my voice.
9. People seem irritated with my voice.
10. People ask, "What's wrong with your voice?"
11. I speak with friends, neighbors, or relatives less often because of my voice.
12. People ask me to repeat myself when speaking face-to-face.
13. My voice sounds creaky and dry.
14. I feel as though I have to strain to produce voice.
15. I find other people do not understand my voice problem.
17. The clarity of my voice is unpredictable.
18. I try to change my voice to sounds different.
19. I feel left out of conversations because of my voice.
20. I use a great deal of effort to speak.
21. My voice is worse in the evening.
22. My voice problem causes me to lose income.
23. My voice problems upset me.
24. I am less outgoing because of my voice problem.
25. My voice makes me feel handicapped.
26. My voice "gives out" on me in the middle of speaking.
27. I feel annoyed when people ask me to repeat.
28. I feel embarrassed when people ask me to repeat.
29. My voice makes me feel incompetent.
30. I'm ashamed of my voice.

Total: E: _____ F: _____ P: _____

Appendix L

Elementary School Teacher Voice Needs Assessment Questionnaire Instructions
Elementary School Teacher Voice Needs Assessment Questionnaire Instructions

February 27, 2002

To: School-Based SLPs and Assistant Principals

Thank you for taking an interest in this doctoral research. I appreciate your efforts and assistance. Prior to disseminating the Elementary School Teacher Voice Needs Assessment Questionnaire for completion, please read the instructions below to the elementary school teachers that have volunteered to participate in this research.

Sincerely yours,

Susan Berlinger-Schwartz, MS, CCC, SLP
Doctoral Student
Nova Southeastern University

Instructions
Elementary School Teachers:

The Broward County Public School has approved Susan Berlinger-Schwartz, MS, CCC, SLP, doctoral student from Nova Southeastern University to conduct a doctoral research project. As elementary school teachers, you have been selected to participate, on a volunteer basis, in this study that will offer a contribution to the educational industry and to many of you individually.

Vocal misuse is evident with teachers, often placing them at high risk for vocal problems. The purpose of this study is to determine whether teachers in the South Florida area are at risk for vocal problems and identify if a preventative tool in the form of a professionally produced videotape will increase awareness of vocal misuse among teachers.

It would be greatly appreciated if you would participate in this study. Please take a few moments to complete this initial questionnaire. The final phase will be scheduled May-September 2002. At that time, you will meet Susan Berlinger-Schwartz, complete a short prequestionnaire, observe the final product, the professionally designed videotape, and complete a short postquestionnaire.

Upon completion of this doctoral project, the Broward County Public Schools will be presented with a copy of the videotape and instructional manual for county use.

Thank you for participating in this valuable research.
Appendix M

Elementary School Teacher Voice Prequestionnaire and

Videotape Viewing Instructions
Elementary School Teacher Voice Prequestionnaire and Videotape Viewing Instructions

*Elementary School Teacher Prequestionnaire Instructions*

It is a pleasure to be here today for the final segment of this study. Thank you for your time you have taken out of your busy schedule to be a part of this research and your contribution in this study. Research reports that teachers are at risk for vocal misuse and vocal overuse because they use their voice as their primary tool of the trade. You were chosen to participate in this study to determine whether this instructional videotape, “Good Vocal Behaviors in the Classroom,” has value for the elementary school teacher.

Today’s agenda will consist of completing a prequestionnaire, viewing the instructional videotape and completing a short postquestionnaire.

Once all the questionnaires are distributed, I will tell you when to start. When you are finished please turn your questionnaire over. When everyone is finished, the questionnaires will be collected.

*Instructional Videotape Viewing Instructions*

Now we are going to watch the instructional videotape. It is approximately 16 minutes in length. When the videotape is over, I will distribute the short postquestionnaire for your completion.
Appendix N

Elementary School Teacher Voice Postquestionnaire Instructions
Elementary School Teacher Voice Postquestionnaire Instructions

Now we are ready to complete the final portion of this study. I will distribute the short postquestionnaire for your completion. I will tell you when to start. Once you have finished please turn your questionnaire over. When everyone is finished, they will be collected. At that time, there will be an opportunity for questions and comments.

Please remember that this information is being used for research purposes. It is important that you work quietly amongst yourselves.
Appendix O

SLP Voice Needs Assessment Questionnaire Instructions
SLP Voice Needs Assessment Questionnaire Instructions

November 6, 2001

To: School-Based SLPs Team Leaders

Thank you for taking an interest in this doctoral research. I appreciate your efforts and assistance. Prior to disseminating the *SLP Voice Needs Assessment Questionnaire* for completion, please read the instructions below to the SLPs that have volunteered to participate in this research.

Sincerely yours,

Susan Berlinger-Schwartz, MS, CCC, SLP
Doctoral Student
Nova Southeastern University

**Instructions**

Speech-Language Pathologists:

The Broward County Public School District has granted permission to Susan Berlinger-Schwartz, MS, CCC, SLP, doctoral student from Nova Southeastern University, to conduct a doctoral research project in the district schools. As a certified speech and language pathologist, you have been selected to participate in this study which will benefit our industry and teachers.

Vocal misuse is evident in teachers, often placing them at high risk for vocal problems. The purpose of the research is to determine whether teachers in South Florida are at risk for vocal problems and to identify if a preventative tool, in the form of a professionally produced videotape, will increase awareness of vocal misuse among teachers.

Please consent to participate in this study. It will take just a few moments to complete this questionnaire. Upon completion, send it through the school courier system, attention Tom Ehren, KC Wright 9th floor. The next phase will be conducted during teacher planning week, August of 2002. Susan Berlinger-Schwartz will present to you a short videotape and request you complete a postquestionnaire. Broward County Public School will be presented with a copy of the findings of the study and instructional videotape.

Thank you very much for your time and consideration.
SLP Voice Needs Assessment Questionnaire Instructions

April 2, 2002

To: Tom C. Ehren
Curriculum Specialist for the Speech, Language & Physically Impaired Programs

Thank you for taking the time to re-administrator the SLP Voice Needs Assessment Questionnaire at the county’s SLP district meeting in April of 2002. This will allow the SLPs who did not have the opportunity in the first administration, to be able to participate in this research. I appreciate your efforts and assistance. Prior to disseminating the SLPs’ Voice Needs Assessment Questionnaire please read the instructions below to the SLPs that have volunteered to participate in this research.

Sincerely yours,

Susan Berlinger-Schwartz, MS, CCC, SLP
Doctoral Student
Nova Southeastern University

Instructions
Speech & Language Pathologists:

The Broward County Public School District has granted permission to Susan Berlinger-Schwartz, MS, CCC, SLP, doctoral student from Nova Southeastern University, to conduct a doctoral research project in the district schools. As a certified speech and language pathologist, you have been selected to participate in this study, which will benefit our industry and teachers.

Vocal misuse is evident in teachers, often placing them at high risk for vocal problems. The purpose of the research is to determine whether teachers in South Florida are at risk for vocal problems and to identify if a preventative tool, in the form of a professionally produced videotape, will increase awareness of vocal misuse among teachers. SLPs will focus on determining if an instructional videotape serves as an adequate preventative tool for teachers to increase awareness that vocal problems exist and that remediation is available.

Please consent to participate in this study. It will take just a few moments to complete this questionnaire. If your school name is on the last page of this questionnaire, there is no need to complete it again. For those of you who have completed this questionnaire, but your school is not listed, please complete the questionnaire again as some were lost in the mail.

The next phase will be conducted during the teacher-planning week, August, 2002 meeting. Susan Berlinger-Schwartz will present to you a short videotape and request that you complete a post-questionnaire. Broward County Public School will be presented with a copy of the findings of the study and instructional videotape.

Thank you very much for your time and consideration.
Appendix P

SLP Voice Viewing Videotape Instructions
SLP Voice Viewing Videotape Instructions

It is a pleasure to be here today for the final segment of this study. Thank you for your participation, the time you have all taken out of your busy schedule, and your contribution to be a part of this research.

You have been selected as expert-raters in this study. You will determine if this instructional videotape will help teachers recognize potential voice problems and that remediation is available to them.

Today's format will consist of three parts. You will watch the instructional videotape titled, *Good Vocal Behaviors in the Classroom*, complete a short postquestionnaire and participate in a raffle for door prizes as a way of my saying, *thank you* for volunteering in this research. Donations have been provided from LinguiSystems, PRO-ED, Super Duper Publications, The Speech Bin, and AliMed.

The videotape will be approximately 16 minutes in length. When the videotape is over, the short postquestionnaire will be disseminated for your completion. We are ready to watch the instructional videotape.
Appendix Q

SLP Voice Postquestionnaire Instructions
SLP Voice Postquestionnaire Instructions

It is time to complete the short postquestionnaire. Once all the questionnaires are distributed, I will tell you when to begin. When you are finished please turn your questionnaire over. When everyone is finished, they will be collected. At that time, there will be an opportunity for questions, comments and the raffle for door prizes.

Please remember that this information is being used for research purposes. It is important that you work quietly amongst yourselves.
Appendix R

Journal Form
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