

Maximising the physical environment

Introduction

While the physical characteristics of a person's work environment are rarely the main cause of voice problems, an environment which is conducive to vocal misuse or one which contributes to irritation of the vocal folds and larynx can increase the teacher's susceptibility to vocal problems. The major environmental enemies of healthy voice production are high levels of noise and poor environmental acoustics. There are many potential sources of high noise levels:

- children's activity
- vocal noise inside or outside of classrooms
- teachers' voices inside or outside of classrooms
- machinery
- aircraft and vehicle traffic noise
- PA system noise
- loud music
- high winds
- noise generated by equipment such as computers, printers and fans.

Noise levels from these sources will have a considerable impact on a teacher's voice use behaviours, particularly when noise cannot be adequately shut out. Open or joined classrooms, thin walls or partitions, poor fitting doors and windows and close proximity to noise sources will all make it difficult to shut out noise.

Problematic acoustic features of the environment include wall, floor and ceiling surfaces which result in sound reverberation or echo such as hard surfaces of lino, tiles, concrete and timber. Other factors which are not conducive to easy voice projection include rooms with very heavy drapes and carpets which 'deaden' the voice and outside at swimming pools, sports fields, playgrounds. Both high noise levels and poor acoustics contribute to vocal misuse behaviours such as loud talking, shouting and strained voice production.

Some environmental conditions may also have a direct impact on the health of the vocal folds and larynx.

- Very dry air (eg air conditioned environments)
- dusty environments
- polluted air
- fumes from paint, solvents, chlorine, felt-tip pens and markers
- smoky environments
- high levels of plant pollens

Any of these conditions may lead to inflammation and swelling of the vocal folds and laryngeal mucous membranes, excessive coughing and throat clearing and production of thick mucous which collects on the vocal folds. It is also possible that some of these environmental factors such as plant pollens, smoke and pollution cause allergic responses of the respiratory system that in turn may adversely affect the larynx and vocal folds.

Strategies for maximising the physical environment for voice

A clear way to maximising your physical environment for healthy voice production is to avoid speaking or singing in any of the adverse environments described above. That is, avoid dusty, smoky, polluted environments, avoid air conditioning, avoid teaching in areas where there are poor acoustics or high noise levels. Teachers will need to develop self-management strategies that minimise the effects of sub-optimal environments and to work with the school management group to improve the physical characteristics of the school setting.

An important first step is for teachers to use the strategies for minimising vocal misuse and for developing effective voice production techniques (refer to the Information Sheets titled *Minimising Harmful Vocal Habits* and *Using Effective Voice Production Techniques*). With effective voice production techniques and good voice care, it is possible to minimise the impact of poor environmental conditions. Learning to use an effective projection technique, for example, will allow the teacher to project the voice safely, even in noisy conditions. The following additional strategies for managing the voice environment are recommended:

- Stand in a place in the classroom that makes it easiest for students to hear and see you
- Move closer to students or have them move closer to you when talking to them

- Arrange furniture to promote short-distance conversations
- Arrange the classroom so that students who are likely to be noisy or need extra attention are at the front
- Turn down background noise such as radios, television, PA systems where possible, or move away from the source of noise when talking
- Encourage students and other teachers to speak with normal voice and not to shout, yell or scream
- Close doors and windows to shut out external noise sources and ensure that doors of adjacent rooms which may be noisy are closed
- Use a portable voice amplifier or megaphone in noisy environments or places which make it difficult to project the voice easily
- Sip water frequently all day to keep your larynx and vocal tract moist and reduce the effects of dry air, dust, pollution and fumes
- Avoid using dusty chalk
- Keep air conditioning and central heating levels low
- Use humidifiers or vaporisers in dry, dusty environments
- Take fresh air breaks as often as possible if working in polluted, dusty or dry environments or if working with paint and other fumes

In addition, plan balanced voice use during a day. Organise to undertake activities where speaking is not involved such as listening to music, tapes, videos and DVDs in classes. Include a period of at least 30 minutes during the teaching day where you can work or relax in a **quiet place** without talking at all.

Work with the school leadership team to achieve environmental improvements such as:

- location of the employees room in a quiet place or designation of another quiet room for voice rest for staff
- location of the music room away from regular classrooms
- banning the use of the PA system for playing loud music
- implementation of sound barriers in open and joined classrooms
- purchase of portable amplifiers for employees
- replacement of low-density walls with high-density materials
- creation of effective door and window seals
- regular vacuum treatment of carpets and cleaning of all horizontal surfaces
- replacement of air filters in forced-air heating/cooling systems at least once per year
- installation of water dispensers in convenient locations for employees
- installation of a watering system to reduce external dust
- creation of wind breaks