

Contemporary Learning Theory: Its Application in the Voice Studio

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based on the writings of Katherine Verdolini, Katherine Maes, and Robert Shewan.

All teachers of singing have experienced the frustration of explaining an idea or technique in detail, only to find that certain students have thoroughly misunderstood the concepts which have been presented. Though they do their best to both avoid a formulaic approach to teaching and treat each student as an individual, most teachers probably question whether they have been sufficiently articulate and clear in their explanations. Unfortunately, the reality is often that students can interpret material that has been presented to them in a way that is entirely different from what the teacher had intended. The student's individual and unique learning style has led him or her to a different conclusion for vocal technique than the one for which the well-intentioned teacher had hoped.

Many voice teachers pass on the "sacred" knowledge that was shared when they themselves were students of singing. Not only do they teach the same fundamentals of singing - often a good thing, in terms of passing on solid techniques of efficient voice use - but the methods they use in their teaching reflect their own preferences as well. Rarely is attention paid to the unique learning style of the student. Obviously, this type of limitation has not prevented the development of many strong and successful student-teacher relationships. Nevertheless, the study of individual styles or "modes" of learning is both interesting and conducive to enhanced success in teaching.

Learning theories specifically derived from the field of psychology have appeared as roots of music education research since the 1960's. Developed outside the field of music, these theories seek to describe, explain, and predict styles of learning. Music educators have embraced the theories with the rationale that musical "behavior" is subject to many of the same laws that govern all of learning.

No two students learn in exactly the same way. Before any learning takes place, students perceive information in either a manner of feeling (i.e., through their senses, intuition, or experience) or analytically (i.e., they analyze, reason, and perceive what is going on in a logical manner). All teachers must realize that both types of learning skills are valuable.

After initially absorbing the information, the next step in learning is the processing of that information. Some students will engage immediately; they are active learners ("doers"). Others reflect on what they have observed/watched or experienced; they are reflective learners ("watchers"). Both systems of processing must be allowed and encouraged. Active learners will need to develop their reflective skills, while also refining their ability to experiment. Reflective learners will need to hone their experimenting skills, while refining the ability to observe. It is the combination of a student's skills in perception and processing of information that determines the way he develops his unique learning style.

EXPERIENTIAL LEARNING THEORY - Dr. David Kolb

In his Experiential Learning Theory, Dr. David Kolb states that there are basically four different styles of learners, combining the modes of perception and processing that were mentioned earlier- feeling or analyzing combined with watching or doing.

While the first group learns through a unification of sensing/feeling and watching, the second group learns through a unification of analyzing and watching. Likewise, the third group of students learns through a unification of analyzing and doing, and the fourth group learns through a unification of sensing/feeling and doing.

Students can also favor a specific mode of information perception; preference for input may be aural, visual, or kinesthetic. For example, it may seem logical that students who learn through a combination of feeling and watching may prefer either kinesthetic or visual modality. A student who learns through a combination of analyzing concepts and watching may prefer visual or aural modalities to process the information. Again, it is our challenge as teachers to expose the student to multiple learning styles and modalities.

LEARNING AS A BIOLOGICAL PROCESS - Robert Leamson

Robert Leamson, in his book *Thinking About Teaching and Learning, Developing Habits of Learning with First Year University Students*, considers thinking and learning first as biological processes. He explains that the neurons in the brain of

the embryo are programmed by the genes to reproduce new neurons until there are billions of them arranged in layers and bundles. Isolated neurons must link with other neurons to facilitate more advanced brain functions. Neurons make these links by sending out projections (called axons), and when these connections begin to form, unions or "synapses" develop. It is interesting to note that the total number of neurons in the brain of a newborn infant is approximately the same as that of an adult; it is the number of these spreading neural connections that is essential to the newborns learning and development. As learning becomes more specialized and sophisticated, the brain continues in its growth and development.

It is the multiple connections between neurons that allow for perception and thought - not just the existence or the number of neuron cells. Additionally, experience and sensory interaction with the environment promote and stabilize neural connections. Neurons send out new axons continually. While these new axons may connect with other neurons, the connections, or synapses, easily atrophy if they are not regularly used. All potentially useful neural pathways will degenerate through disuse. Learning, as defined by Leamson, is the stabilizing through repeated use, of certain appropriate and desirable synapses in the brain. Teaching is defined as any activity that has the intention of and potential for, facilitating learning in another person's brain, and education is defined as learning that has been facilitated by teaching.

This theory would support the perception part of learning, and it further explains the processing part of thinking and learning. As active or reflective learners we first use whatever labile networks are available, and by repeated use of these synapses, we stabilize these connections. This provides us with memory of what is understood. Leamson believes that it is truly the experience and sensory interactions with the environment (i.e., learning through good teaching, thinking, and experimentation with our vocal tasks) that allows us to engage and make sense of things.

LEFT BRAIN/RIGHT BRAIN THEORY - Dr. Roger Sperry

Yet another theory of learning styles has been offered by Dr. Roger Sperry. He believes that there are two forms of thinking - verbal and non-verbal - which function quite separately in the left and right hemispheres of the brain. Sperry further states that he believes our educational system generally tends to neglect and even actively discriminate against nonverbal forms of intellect. According to Sperry, it is imperative that educators do everything possible to provide activities that exercise both hemispheres of the brain. Research on hemispheric dominance and its application to music education has proliferated since the 1970's.

It appears that the left brain prefers a linear, sequential type of processing, while the right brain uses more global processes in receiving information. Activities which favor and stimulate access to the right brain mode include metaphors, visualization, imagery, poetry, all Fine Arts, the use of modalities (auditory, visual, and kinesthetic), acting, movement, and dance. Studies have shown that singing involves both hemispheres in coordination. Aspects of musical processing that require judgements about duration, temporal order, sequence, and rhythm differentially involve the left or speech hemisphere, whereas the right or musical hemisphere is differentially involved when judgements about tonal memory, timbre, melody recognition, and intensity are concerned. Vowel shapes, emotional inflections, and rhythmic movement also stimulate the musical hemisphere, while the interpretation of consonants falls to the speech hemisphere. Singers who favor the right brain mode over the left neglect such things as analysis, memory skills, and responsiveness to structure, sensitivity to verbal sounds, writing skills, and phonetic discrimination. Balance in training is essential, but with the musical hemisphere allowed to slightly dominate. One commonly used technique to achieve this end is asking a student to imitate her own speech sounds for singing. This is not a new concept, but one that is often misunderstood by Americans, who speak in the throat, on low pitch levels, with glottal fry and little emotional inflection. For most Americans, to "sing as you speak" would be a vocal disaster. Before students can take advantage of these tasks, they must learn to speak with resonant timbres, focused vowels, and with a wide range of emotional pitch inflections. In order to balance the right and left brain functions, students should first be taught to "speak as they sing" and only later, to "sing as they speak."

IMPLICIT MEMORY THEORY - Dr. Brenda Milner

The theory of Implicit Memory and its application to skill acquisition is likely the least familiar of current learning theories. This theory is based upon observations of normal learners in comparison with people suffering from amnesia. It is proposed that there are different memory systems for information processing modes with distinct neuro-anatomical and cognitive substructures; one system or mode that governs "knowing how" and one that governs "knowing that".

Implicit memory is memory without awareness. Based on studies by Dr. Brenda Milner with both amnesic and normal subjects, this theory implies that implicit memory is a memory system or processing mode that appears to govern skill

acquisition and does not involve conscious awareness of what has been learned. In fact, implicit memory may be indifferent to awareness. Explicit knowledge of information to be learned may actually interfere with the development of implicit memory in some cases. These original studies were examined and elaborated upon for use in teaching by E.L. Thorndike, D.L. Schacter and K. Verdolini.

Attention to implicit memory might be quite surprising to some teachers since it likely maximizes focus on sensory information, minimizes verbal analytic explanations, and suggests training with a variety of materials and in physical environments that will be relevant for performance. According to this particular ideology for example, knowledge about voice science may be extremely helpful to us as teachers, but that knowledge is not necessarily helpful to our voice students. In particular, a mechanistic awareness about voice production in teaching, such as "expand your ribcage and drop your jaw", may be fruitless or counterproductive according to this theory. This is a strong statement and may not extend to all situations.

Implicit memory appears to be fundamentally governed by perceptual processes. One of the central tasks for any teacher is to promote the student's processing of perceptual (i.e., sensory) information during training. Teachers must show students what good alignment for voice production looks like. Teachers must let students feel a deep breath. They must let them listen to the sound of a focused voice.

Implicit memory requires attentional process where novel stimuli are concerned. Anything that diverts attention away from perceptual or sensory information related to voice may interfere with memory development. Too many instructions about mental strategies can lead the learner to attend exclusively to the strategies themselves while neglecting sensory information. Attention to perceptual information is often diverted by emotional responses. Statements such as "That was terrible!" or "My God, you sing better than Joan Sutherland!" are sure to distract the student's attention from the sensorial experience. The best way to describe what attention to perceptual information "looks like" is "being in the moment".

Implicit memory depends on repetition and is modality and context specific. Within the framework of implicit memory, modality strengths take on a different meaning; that is, the modality best for training is the one required for task execution. The result: the task itself reinforces the implicit memory. In voice production for example, perceptual (not verbal) information guides central nervous system output commands. Therefore, it is suggested that training should occur in the perceptual realm, including auditory, kinesthetic, and visual modalities, depending on the specific task. Thus, according to this learning theory, if a student is trained in the verbal mode, a translation of the information from "verbal" into "perceptual" will be required before voice can be produced. This transformation takes time and it is believed that precious information may be lost or distorted in the process. The verbal mode of learning would only be correct when the goal is to have the student learn to talk about voice production. If the student is to actually learn to produce voice better, regardless of their modality strength, the verbal instructional mode may not be preferable.

In addition, training benefits may be greatest when training occurs in the same (or similar) environment as will be encountered for performance. Teaching a student in the space where they will perform can produce excellent results.

Skill acquisition demands information about performance (knowledge of results). Students need information about how they are performing relative to what you want them to do, but intensive feedback may not be good. It is suggested that withholding information about performance for several trials may improve the student's own processing of information and later performance or learning. To be able to perform skills along with other tasks, consistent responding is required during training. If the student is to use a certain voice production mode while singing, the same mode or a similar mode must be consistently used in speech.

Further benefits can be gained through the use of a variety of training materials. Contrasting training exercises/materials will probably improve a student's ability to generalize a target-voicing mode. For example, if a student is working on focusing the voice, he should practice on many different vowels, phrases, songs etc. In that way when he encounters new, unknown music, skill in the production of a focused voice should transfer more easily.

The principles discussed here can be tied together into a logical equation. According to this theory, skill acquisition fundamentally involves attention to perceptual information in numerous repetitions, with varied tasks and avoids a mechanistic awareness of voice production. As much as possible, the student stays in the relevant modality, which is perceptual, not verbal. Numerous repetitions occur, with consistent performance required across different tasks. There should be some, but not too much, feedback.

Katherine Verdolini suggests five steps, which enhance the behavior training following the principles of implicit memory outlined above. It is reasonable to make some generalizations from these studies to skill acquisition in voice teaching. Using breathing as an example, the goal is for the student to expand the abdominal area on inspiration, and let it contract during expiration and voicing:

Step 1. Direct the student's attention to the body in general, and ask them to notice any sensations. (Scan your body with your mind's eye. Do you notice any sensations?) Do not ask the student to describe the sensations verbally.

Step 2. Direct the student's attentions to the specific body part of interest, in this case the abdomen. ("Focus on your abdomen as you breathe"). The desired behavior may appear with this step, if not, move to step three.

Step 3. Model the behavior for the student. For example, without saying anything, place the student's hand on your abdomen as you breath in and out.

Step 4. Manipulate the student's body so that the target behavior is likely to occur. In this case, you might stabilize the shoulders and chest so that only the abdomen is available for movement during breathing.

Step 5. As a last resort, verbally instruct the student what to do.

In conclusion, most teachers instruct students in a manner similar to that in which they themselves were taught, especially if it reinforced their own learning style and modality. This is understandable, particularly if they were successful in their learning. Teaching another way provides uncertainty and risk: will the students learn? Alternatively, should students be limited by the instructor's own learning preferences? Greater interest in the area of brain research for singing will stimulate the discovery of new techniques for developing the singer's conceptual framework. Certainly the profession is multifaceted enough to accommodate a variety of diverse theories to explain different phenomena in voice learning. All teachers should develop a teaching or learning cycle in order to connect with a student's learning style preference and expand his or her ability to learn through the various learning styles and modes.

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Christopher Arneson is a professional voice trainer and Vocologist who works with singers, actors, politicians, and public speakers to build powerful, effective voices. Dr. Arneson is co-Director of the Voice and Speech department at the Actors Studio MFA program at the New School University in New York City. He has developed a new Voice-training program there, and has contributed significantly as an author of the three-year curriculum for Masters students, designed to partner and parallel the work of the Method actor. In addition, he teaches Voice and Vocal Pedagogy at the Mason Gross School of the Arts at Rutgers University in New Brunswick, New Jersey. Dr. Arneson has completed Vocology internships at the Grabscheid Voice Center at Mt. Sinai Hospital and the Vox Humana Laboratory at St. Luke's - Roosevelt Hospital where he collaborates with Otolaryngologists and Speech-Language Pathologists in the remediation of professional voice disorders. He currently works privately with clients in New York City and New Jersey. His students perform at major opera houses in the United States and abroad and on Broadway. He is a frequent guest speaker regarding the training and care of the professional voice and will be a guest speaker at the New York State Theatre Educators Conference in New York City in the fall of 2002. Dr. Arneson will also present lectures/workshops for New York University's Theatre Education department. Dr. Arneson holds the Bachelor of Arts and Master of Music degrees from Binghamton University, and has recently completed his Doctoral studies at Rutgers University. He has performed extensively in the United States and Europe in opera, concert and music theatre, with engagements that have included the New York Philharmonic, the New Jersey Symphony, the Opera Orchestra of New York, Houston Grand Opera, the Santa Fe Opera Festival, the Netherlands Opera, and the Edinburgh Festival. Dr. Arneson writes for "Classical New Jersey - New Jersey's Classical Music Magazine." He is a member of the Voice and Speech Trainers Association, Opera America, and the National Association of Teachers of Singing. Dr. Arneson has recently joined the Board of Directors for the New York Singing Teachers Association and will join the renowned voice faculty at Westminster Choir College in Princeton, NJ in the fall of 2003.

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