

Establishing Patterns of Excellence

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We are what we repeatedly do. Excellence, then, is not an act, but a habit.
Aristotle

1. How can we help our students to reach their highest musical potential?

- Teachers can foster excellence by studying and applying the concepts of motor control in their teaching
- Students can establish good physical patterns to aid them in their technical development and to prevent injuries

2. The problem of Bimanual Processing

- String players have a special challenge in learning to play – bimanual processing
- Unlike players of most other instruments, a string player performs distinctly different tasks with the left and right hands
- Coordinating left hand and bowing efforts demands a series of highly specialized production protocols
- A production protocol is a set of learned physical responses necessary to perform a complicated physical task
- These production protocols must be readily available if the player is to be ready to react to a specific stimulus almost automatically

3. Applying production protocols to bowing skills

- The body learns the correct muscle movements necessary to produce different bow strokes through repeating each bowing gesture until the correct motion is firmly established
- Students may practice *martelé*, *detaché*, *spiccato*, *ricochet*, and *sautillé* bowings separately from any left hand involvement until these responses are stable and predictable – requiring no cognitive processing from the player
- Once the right hand motion is firmly established, the player may add fingering
- At first, the student may play multiple repetitions of the bowing motion on each fingered pitch in a scale or the notes in a technical passage
- As skills improve, the player can gradually decrease the number of repetitions until the entire scale of passage can be performed as written, utilizing the required bowing skill

4. Developing left hand production protocols

- Students can increase left hand dexterity and speed by introducing short patterns of notes, repeated many times, until the physical response becomes almost automatic
- Players who develop automatic response patterns to scales, arpeggios, and thirds in any given key are improving their ability to react in an appropriate way to new stimuli
- Recognizing familiar patterns allow the mind to switch to autonomic processing for those tasks, freeing the concentration to focus on new information
- Students should be encouraged to study new music for recognizable patterns – scale fragments, arpeggios, thirds, or sequences
- Identifying these structures increases the ease with which the student processes and decodes playing problems and applies appropriate techniques

5. Structuring motor learning to facilitate skill development

- Teachers need to provide goal-directed activities and give specific practice instructions for students learning a physical skill
 - i. Achievable goals
 - ii. Break task down into component parts
 - iii. Establish physical operations for each
 - iv. After achieving success in individual tasks, have students put the components together to shape appropriate technique

6. Facilitating students' development of production protocols

- Teachers can help students develop skills in the following ways:
 - i. Provide a focus for student efforts
 - ii. Give feedback and encouragement for their work
 - iii. Recognize the problem when students have difficulties
 - iv. Propose solutions that students may be too inexperienced to recognize
- Developing these techniques is best accomplished with an established daily routine of consistent practice of essential skills
- By establishing basic techniques before students encounter them in the music, teachers may increase the efficiency with which their groups learn and perfect the repertoire
- This work also facilitates the sight-reading potential of students by providing them with an arsenal of typical bowing and fingering patterns well-established in each student's autonomic memory

7. Effective procedures for accomplishing objectives

- Modeling – many students learn better and more quickly by imitating an example from the teacher rather than inventing their own technique for specific tasks
- Establishing efficient practice habits – help from the teacher about how to practice and how to structure the practice period can save the student hours of unproductive and frustrating practice time
- Varied practice routines – teacher information about approaching a task from several different angles at different points in the practice period can minimize boredom and allow students to view practice as a game rather than drudgery

- Promote transfer- teachers can help students learn to recognize similarities in new pieces or excerpts to something they have already learned to do and to thus apply the same production protocols

8. Reaction time

- Sight reading requires ability to process information rapidly, identify the stimulus of new music, quickly decide what motions will be needed to play the music, and move into action with the appropriate responses
- The thought processes associated with seeing the music involve response selection
- Routine practice of scales, arpeggios, broken thirds, and sequential melodic patterns in various keys familiarize students with the most common patterns encountered in most music
- Bowing patterns, rhythmic skills, string crossings, slurring patterns, and different articulations also comprise playing habits from which to choose to meet the demands of the music
- When all these elements are so well learned as to become automatic, the player is ready to apply them to each new situation

9. Individual differences

- Students' physiological differences enter into ability to use the bow and finger the notes
- Students with short arms and/or fingers will approach bowing and fingering from a different perspective than students with longer arms or fingers
- Teachers may help students accommodate their individual differences by analyzing the movement needed to accomplish any given activity and by creating little exercises to train the muscles to do the needed task
- Once the accommodation has been made, students can proceed to establish this new production protocol to their set of autonomic responses

10. Prevention of injury

- Teachers can help students to realize that string playing is essentially a muscular activity
- Players need to warm up their muscles prior to practicing just as an athlete warms up
 - i. Hand flopping, shoulder rolls, and arm circles help warm up the muscles involved in string playing
 - ii. Warming up the muscles can help the student avoid the repetitive stress injuries that adolescent players may suffer
 - iii. Stretches can relax and lengthen muscles that have become tense through long and arduous practice sessions
 - iv. Muscle strengthening motions can help students develop the strength and endurance they need to play easily
- Correct posture and set-up are also crucial to healthy playing habits
- Good practice habits allow students to accomplish more in less time, significantly reducing the risk of injury

11. Performance anxiety

- Motor situations requiring important decision-making need a lower level of arousal for maximum performance to take place
- The more narrow and intense the focus becomes, the more details are likely to be missed
- Certain physical responses that still require a large amount of the player's consciousness may disintegrate under the stress of a performance situation
- The player must be prepared to the point that habit takes over the muscles, leaving the mind free to deal with handling the stress
- Unusual performance conditions – memory slips or mistakes – may require more conscious decision-making than the performer is prepared to do, causing him or her to “go to pieces”

12. Stress management techniques

- Muscle to mind skills – strategies to offset excessive arousal that can interfere with a player's ability to process and perform
 - i. Breathe deeply to offset the tendency to hold one's breath from stress
 - ii. Progressive relaxation techniques to relieve stiffness of fingers or shaking hands
 - iii. Cultivating a free flow of oxygen to the brain to allow mental functions to proceed uninterrupted
- Mind to muscle skills – methods to distract and derail negative thoughts and introduce a calm frame of mind
 - i. Meditation
 - ii. Visualization
 - iii. Positive affirmation

13. Conclusions

- Playing a stringed instrument involves highly complicated muscular coordination in addition to aural acuity and musical sensitivity
- Physical skills must be developed systematically over a period of time and reviewed frequently to refresh their facility
- The physical, mental, and affective qualities of response are all necessary for students to produce a good quality performance – none is sufficient alone
- Teachers who promote the development of a sufficient collection of production protocols can greatly improve the efficiency of their students' music learning and the excellence of their playing