

PRACTICE MAKES PERFECT, BUT ...

What are the keys to effective practice?

Do our music students really know how to practice? For that matter, do we? International music education specialist MICHAEL GRIFFIN has been visiting schools around the world explaining the why and how of music practice, encouraging students to aim high and to believe in their musical potential.

I love talking to students about how they practice and learn their music. Recently I've talked to students from different education systems from countries in Asia, Australasia, Europe and the Middle East, and found that students are fascinated with how learning occurs, and excited by the prospect of becoming better learners. Everyone likes learning— but not necessarily in formal school situations. The boosts in self-esteem and self-growth resulting from mastery of a concept or skill are indeed some of life's great joys. We are born to learn. But I rarely observe systematic approaches within school music departments that address the 'how and why' of practice. Given that the majority of instrumental tuition is delivered by private providers, *learning how to learn* music it is often left to chance, and the initiative of that individual. Students usually know that slow practice is prudent, for example, but they don't always understand why. This article reviews some fundamentals of musical practice.

'Do you want to be an expert?'

When I ask this question, a majority of students indicate that they do— not necessarily in music, but at least in some domain. In recent times many books have been written about the nature of expertise and the 'expert brain' (see Notes). The average human brain consists of about 100 billion neurons, and the brain's job is to find patterns and to make connections. When a stimulus is repeated often enough, a new connection or neural circuit is made. Further repetition strengthens this connection in the form of myelin, a fatty white substance that coats the axon of a neuron. This is known as 'the white matter' of the brain and, as an insulator, myelin significantly increases the speed of the neural impulses involved in transmitting information. So what is the answer to this question 'do you want to be an expert?'. Build more myelin. But how? By repeating an activity. How often? More is better, but at least four times for a new neural connection to form. *Repetitio est mater studiorum!*

How long does it take to be an expert? In his book *This is Your brain on Music*¹ Daniel Levitin maintains that the



emerging picture from research studies is that 10,000 hours of practice— that is, approximately three hours practice per day for ten years— are required to achieve the level of mastery associated with being a world-class expert. What Levitin suggests is that nurture is a far more important factor than nature in becoming an expert. Daniel Coyle in *The Talent Code*² says that as long as an individual has a threshold level of natural ability, what distinguishes expertise is a matter of hours. This doesn't mean that everyone who puts in 10,000 hours of work inevitably becomes an expert— rather that experts who have done less than this are few and far between. Malcolm Gladwell³ cites many excellent examples confirming this point with stories about The Beatles, Mozart, Bill Gates and others. But from

my perspective, the point of all this is that these research findings can be used to encourage students to work hard and to believe in their ability to improve— that the brain is plastic and can become anything that we want it to be if we are willing to work hard enough. When I ask students if this seems like too much hard work, a few hands show. But as I say, if this is the case, then all the better because those of us prepared to work hard will be distinguished by our efforts.

Most music students are told to practice slowly. Interestingly, everyone's conception of 'slowly' seem to be different! As teachers, we need to model what we mean by slow practice and know why it is a cornerstone of effective practice. Rachmaninoff said 'the most efficient manner in learning to memorise a piece seems to be the one which proceeds in an error-free manner'. He believed that if we had never 'practiced' an error, the chances were we wouldn't perform one either. Hence he was known for excruciatingly slow practice— like setting a metronome on the slowest tempo, moving only incrementally once a musical passage had been successfully learnt. Our brain doesn't distinguish bad habits from good— it simply does its job of learning patterns faithfully. Coyle refers to slow and repetitive practice as 'deep' practice. He says that when we slow down our brain can pay deeper attention to the neural circuits being formed and 'myelinated'. He cites an example of a New York music academy where a professor told students 'if what you're

practicing is recognisable, then you are playing it too quickly'. Mozart was known to repeat a musical passage ten times during practice. His father would place ten dried peas in Wolfgang's left coat pocket and after each successful attempt, a pea would be moved to the right pocket. Of course any failure—even on the tenth repetition—would mean all the peas were moved back to the left pocket and young Wolfgang had to begin over again. What encouragement to slow down and play a passage perfectly!

Isolating a passage for 'deep' practice is known as 'chunking' which simply means organising items into manageable units. It has been more than fifty years since psychologist George Miller wrote his paper 'The Magical Number Seven, plus or Minus Two'.⁴ He explained that our short term or working memory is limited by what it can deal with, to about seven discretely different things, and hence the need to learn in small units. I like to use a telephone number as an example—we usually chunk a 10-digit number into units of four and three for easier recall. The other important truth about working in small units is successful completion of a unit. Completing a task successfully is motivating and satisfying. It gives one a sign of progress, lack of which is one of the key reasons people give up learning an instrument.

Good learners are meta-cognitive—that is, they take responsibility for their own learning and reflect on it. Successful deep practice—determining the chunks and units of work, repeating them sufficiently and at slow tempi—are excellent indications of a meta-cognitive practice routine. Another good practise is what psychologists call 'verbal mediation'. This is an active description of our thinking as we practice. I often ask students to tell me what they are thinking, that is, to 'think aloud' as they practice. I find that this will almost always uncover the root of a problem.

Practicing music can take different forms. Most students practice music with their instrument and notation, most of the time. But it is very good for the development of the whole brain to practice the other permutations involving the use or non-use of music and/or instrument.

With instrument With music	Without instrument With music
With instrument Without music	Without instrument Without music

It's been only relatively recently that brain scanning techniques have revealed to us the true power of the imagination. In one such experiment, a young violinist had MRI scanning done under two conditions: first playing music with the violin and second with no violin, but imagining the playing of the same music. The scan showed almost the exact same neural functioning and circuitry. I often tell a story—which I am told is true—about a professional golfer who, after being imprisoned for a year for a crime, played a spectacular round of golf on his release. When questioned by his golfing buddies how this was possible with no practice for a year, his reply was 'but I did practice—18 holes every day up here', pointing to his head. This person went through all the detail as he would in a usual round of golf and his imaginary game took about the same time as a real game of golf. When I was studying piano, my teacher encouraged me to read my score on the train and practice imaginary piano on my lap. When travelling by plane, John Coltrane used to close his eyes and practice on a piece of wood, imagining that it was his saxophone.

I can't relate all the benefits of playing with and without music, but we do know that reading music is more of a left-brain than right-brain activity, and that playing from memory uses the right hand side—so it makes sense to do both and activate the whole brain. Whole brain activation has been a key ingredient in the annals of human genius. Einstein was an advocate of the power of the imagination and for the artistic endeavour as a means of providing inspiration. The great scientist was well known for his competence as a violinist, and for being inspired when day-dreaming. Renaissance man Leonardo da Vinci studied the 'art of science and the science of art'.

When problems are recognised and errors encountered, it is important to deal with them as soon as possible. During 2009 I took an opportunity to perform as part of a duo at Dubai's iconic Burj al Arab Hotel. This ten-week assignment was undertaken at very short notice, and my job in accompanying an unfamiliar singer provided several challenges, not least of all playing a repertoire in my singer's unique key set. I kept a notepad on the piano to detail those passages that required additional practice and revision, and would duly practice these the following morning in readiness for the next evening. The best time to solve a problem is as soon as possible. I don't like musical problems incubating in my mind!

The same principle of immediacy in fixing musical problems also applies to retaining inspiration. I encourage students to use their technology ('read' mobile phones) during their music lessons... but not in the traditional sense. The average mobile phone has three functions that are useful for learning: a video recorder, a sound recorder and single-image camera. Teachers can record homework and playing advice on a student's phone sound recorder, or more pro-actively, students might ask to record their teacher to repeat their 'gem' of advice just proffered. Photos can be taken of embouchure, hand position and the like, and students might video a teacher's model performance.

While the suggestions above might make sense to students, you can't assume a seamless transition into their practice routines. Students need to practice how to practice. Teachers would do well to model practice techniques, and then observe the student practicing. As Daniel Coyle says 'it's not practice makes perfect, but perfect practice makes perfect'. **M in A**

Notes

1. D Levitin, *This is your brain on music: The science of a human obsession*, Dutton, New York, 2006.
2. D Coyle, *The talent code: Greatness isn't born. It's grown. Here's how*, Bantam Dell, New York, 2009.
3. M Gladwell, *Outliers: The story of success*, Little, Brown and Company, New York, 2009.
4. G A Miller, 'The magical number seven, plus or minus two: Some limits on our capacity for processing information', *The Psychological Review*, vol. 63, pp. 81-97, 1956.

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After more than twenty years as a music educator and administrator in Adelaide and Dubai, Michael now travels extensively working as a music education consultant mainly for independent schools in Asia and Europe. In Australia he was presented with the Education and Arts Ministers' Award in 2006 and was nominated for a National Teaching Excellence award in 2005. As an author, Michael has recently published the *Music and Keyboard in the Classroom* series, and *Modern harmony method*, and is presently working on a book about musical learning. As a musician, Michael has been a resident performer at world-renowned hotels such as Hayman Island (Australia) and the seven-star Burj al Arab Hotel in Dubai.

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