Effective practising: A research perspective

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Abstract

This paper reviews latest research findings on practising in an attempt to encourage studio music teachers to trial new approaches. Literature shows that expert performers begin learning an instrument at an early age, and sustain and increase their deliberate practice over at least 10 years. A certain amount of practice hours is needed to achieve professional level. Both formal and informal practice are important in the development of skills. Structured practice based on clear teacher instructions gives better results than unstructured practice. Technical work in practice should be directed to solving repertoire problems to initiate transfer of learning. Effective practising strategies include chunking, modelling, mental rehearsal, and hand reversal. Developing metacognitive skills in students will lead to greater self-regulation and effectiveness in practice. Selection of interesting repertoire is vital for maintaining students' motivation. Parental support plays an important role in the early stages of learning, while in the teen years participation in extra-curricular musical activities has significant educational and motivational value. Research findings reviewed in this paper have implications for the teaching profession and deserve consideration and trial.

***Keywords*:** Instrumental practice, expert performance, parental influences, structured practice, practising strategies, self-regulation, motivation.

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Introduction

The question of practising has been a perennial topic of discussion between instrumental music teachers and their students. Yet, despite the growing body of evidence on effective practising many teachers tend to rely on their own experience as a learner and their teaching observations and continue to issue the same advice to their students. For example, the idea of 'slow practice' as a basic remedy persists among teachers (Lehmann, Sloboda & Woody, 2007). This paper reviews recent research findings on practising in an attempt to encourage music teachers to trial new approaches in their studios.

What is practising?

Lehmann and Gruber (2006) describe practice as a "systematic activity with predictable stages and activities" (p. 461). In learning a new piece four stages of practising were identified by Chaffin, Imreh, and Crawford (2002): the 'big picture' overview of the work; technical practice that includes overcoming problems, achieving automation and memorisation; polishing the piece up for a performance; and finally maintenance of the piece. To implement these four stages in individual practice teachers could, for example, include in lessons activities such as listening to a recording/ or teacher performance of the work prior to learning to identify the basic character and locate the difficulties; drilling, repetitions and slow practice to overcome technical problems; considering articulation and dynamics in developing the interpretation and playing the piece through in preparation for a performance.

Hallam (1997a) defines musical practice as a multi-faceted activity. She suggests that an important dimension of learning to practice concerns how well a student is able to develop

technical skills, music interpretation, ability to play from memory and to overcome performance stress. These technical, cognitive and performance skills cannot be acquired by repetition alone. Therefore, it is important that teachers continue to offer practical advice on how to practise differently at various stages of learning.

In the last 15 years researchers have coined a number of terms to describe different types of practice:

- *deliberate practice* focuses on achieving specific goals (Ericsson, 1997; Ericsson, Krampe & Tesch-Romer, 1993);
- *formal practice* demonstrates deliberate effort (Sloboda, Davidson, Howe, & Moore, 1996);
- *informal practice* constitutes enjoyable leisure music-making (Sloboda, Davidson, Howe, & Moore, 1996);
- *structured practice* involves a detailed regime and sequence of practising (Rosenshine, Froehlich, & Fakhouri, 2002);
- *unstructured practice* involves freedom to practise in any order and with no particular goals (Barry, 1990, 1992);

Practising and expert performance

The question of practice has received recent attention by researchers interested in expert performance across many fields including music. Numerous similarities have been found in the personal development of experts in different domains, for example in sport, especially in the area of practising required to achieve the level of expert performance (see Ericsson, 1997, for a review of literature).

First, there is a need to clarify the difference between 'expert performance' and 'ordinary performance'. Ericsson (1996) defines expert performance as "consistently superior performance on a range of relevant tasks" (p. 4). In case of musicians, this refers to exceptionally gifted, outstanding performers rather than the general mass of music students. Expert musicians demonstrate superior performance in both technical and expressive dimensions of their playing (Sloboda & Davidson, 1996).

Existing research shows that most expert musical performers started playing an instrument at a uniformly young age, between six and seven years old (Ericsson, Tesch-Romer, & Krampe, 1990). The level of practice had to be sustained and increased through adolescence and early adulthood to reach the expert level. The increase in practice needs to be gradual as a sudden large increase can lead to overuse injuries and a possible burnout (Ericsson, 1996). DeCarbo (1990) supported this view in a study which interviewed nearly nine hundred music students in the State of Florida, USA, and found that the most successful instrumentalists begin their music studies in primary school, receiving individual tuition and participating in solo and ensemble competitions and performances. Outstanding students start with small amounts of practice, continually increasing their commitment over a number of years, while amateur students' practice often levels out around the age of ten (Ericsson, Krampe, & Tesch-Romer, 1993).

Quantity of practice

Research suggests that an average of four hours of practice per day over the period of ten years is required to achieve the expert level (Ericsson, 1996). Yet, this number varies depending on the instrument played. Jorgensen (1997) showed that pianists and violinists practised the most, followed by woodwind, brass and singers. This could be explained by the physical demands associated with playing of particular instruments, for example the exertion of the lungs and lips of brass players prevents them from practising as long as string players.

As students' expertise develops, the amount and frequency of practice show comparative increase (Sloboda et al., 1996). This is linked with increasing length of pieces, greater amounts of technical work required by various examination bodies and students' participation in extra-curricular music activities. There is an explicit relationship between

the quantity of practice and skill levels achieved (Jorgensen, 2002). Most studio teachers advise students to practise more to achieve better playing. Particularly, in higher education instrumental music students are expected to practise regularly, the average being 20–25 hours per week (Jorgensen, 2004). Other time-management strategies for productive practice need to include "setting aside blocks of time to practise, ensuring effective use of that practice time, organising the study environment and committing oneself to completing practice goals" (Nielsen, 2004, p. 246).

Quality of practice

The quality of practice is also an essential element. Ericsson, Krampe and Tesch-Romer (1993) refuted the belief that simply a sufficient amount of practice would lead to maximal performance. They have coined the term 'deliberate practice', in which explicit instructions about the best method of practising were given and supervised by the teacher who diagnosed errors and provided informative feedback. For an exceptional performance ten years of deliberate practice was an average. Deliberate practice is different from other activities, such as work (which is directly motivated by external rewards) and play (which consists of intrinsically enjoyable activities with no particular goal), in the way that it includes strategies specifically designed to improve the current level of performance. These researchers suggest that natural ability (talent and physical attributes) does not account for success; the differences between experts and non-experts lie in the experts' long-term deliberate effort to improve their performance.

Sloboda, Davidson, Howe, and Moore (1996) support this view and use the terms 'formal' (deliberate effort) and 'informal' (playful pastime) practice to describe the same phenomenon. They compared the practice time of different groups of young musicians and found that high achievers spend more time in both formal and informal practice from an early age, and participate in more concerts and competitions, which motivates them significantly to maintain these high levels of practice. Sloboda and Davidson (1996) verified these results in a study using detailed diaries to record events as they actually occurred. They found that over the entire learning period high achievers amass twice as much formal practice as moderate achievers, four times as much as underachievers and up to eight times as much as students who give up lessons. At the same time high achievers also participate in more informal practice. These two studies highlight particular features that distinguish high achieving young musicians from other young people: very high levels of formal practice and moderate levels of informal practice. McPherson (1999) also supports this view by suggesting that both facets, formal and informal practice, "are essential ingredients for continuing success" (p. 153).

The most important skill that can be taught by an instrumental music teacher is how to practise. Even tertiary music students who spend many hours every week practising alone still need to be taught how to use this time constructively. McPherson and Davidson (2002) stressed that it is the role of the teachers to show students "how to practice, to set manageable and appropriate goals for their progression, and to monitor the success or otherwise of the practice strategies" (p. 154). This view is supported by Rosenshine, Froehlich and Fakhouri (2002), who suggested that "practice at home is facilitated if the teacher gives specific instructions about what needs to be worked on, how to do it, and what the result should sound like" (p. 309). For younger students these instructions need to be written out in a set of procedures that structure their home practice (Barry & Hallam, 2002).

The different effects of structured and unstructured practice on technical accuracy and musicality of music students have been investigated by Barry (1990; 1992), who found that systematic approaches to practice yield better results than free practice. McPherson and Renwick (2001) stressed the need for evaluation of practice habits through the use of diaries. The best way to implement this in studio teaching is to ask students to keep a practice

dairy for a week to record time spent on different tasks and describe briefly how they practised, then read it together in the lesson and make suggestions for improvement. The diary can uncover, for example, insufficient overall practice time, irregular practising, disproportionate use of time on technical work versus repertoire work, preferential practice of a particular (often the favourite) work, rigidity of regime (the same order of practice daily), inflexibility of approach (always practising in the same way) and myriad of other weaknesses.

Instrumental music teachers in higher education are working with advanced adults, and thus have an expectation that students already know how to practise. Yet university teachers give more specific instructions on how to practise, encourage students to use a variety of approaches to practice, and to use the metronome more than teachers of pre-tertiary students (Barry & McArthur, 1994). Thus the more advanced students are given greater autonomy in deciding which practice techniques to use. This assists students in the development of their cognitive processes and self-regulation (McPherson & Zimmerman, 2002). One example of developing these strategies in students is the Process Diary project required of music students at the School of English, Media and Performing Arts at the University of New South Wales. The students are asked to make weekly entries reflecting on their practising techniques, preparation process and progress towards the end of semester performance examination. The aim of this project is to encourage students to trial new approaches to practising, to evaluate their success and to engage in thinking about practice.

What to practise

Research has shown that during practice the greatest amount of time is spent on repertoire, followed by technical work (McPherson & Renwick, 2001). Warm-up exercises, technical work and studies are often included in practice sessions. There is some evidence that students do this type of preparatory work prior to practising repertoire (Duke et al., 1997).

It is important to direct technical work towards solving particular problems encountered in the repertoire being studied so that transfer of learning occurs (Nielsen, 1999). For example, practising the scales and arpeggios in the key of the piece being studied familiarises the student with typical finger patterns and frequently used musical formulae. This decreases time needed to overcome similar difficulties in the piece itself and facilitates transfer of fingering and technique already mastered.

McPherson (2005) urges teachers to include activities such as sight-reading, playing by ear, and playing by memory in lessons and practice because these develop students' mental strategies as suggested by the *deliberate practice* literature. Unfortunately, too few teachers do regular sight-reading in lessons (Zhukov, 2006a) and focus on this area only in preparation for a sight-reading test in an examination. This is unlikely to encourage students to do any sight-reading at home. Memory work is more frequent, but again despite a large body of literature on memorisation (e.g., Ginsborg, 2004) teachers offer few practical strategies beyond "Try to memorise this". Playing by ear tends to be included in jazz lessons, but in Western Classical music instruction is only common in Suzuki teaching. While sight-reading, memorisation, and playing by ear are part of the Australian primary and secondary classroom music curriculum, educators, researchers and practitioners need to continue their efforts to raise the awareness of the importance of these skills in instrumental music teaching.

How to practise

Ericsson (1997) suggests that the most effective learning occurs when a task is well defined, of an appropriate difficulty level for the particular individual, when teacher feedback is informative, and when opportunities for repetition and correction of errors are provided. Effective practice includes a number of learning strategies, such as practising at a slow tempo, gradually increasing the speed, using the metronome, silent practice (away

from the instrument), clapping rhythm, identifying trouble spots and analysing the music (Barry, 1992; Pace, 1992).

The most obvious practise strategy is to repeat a difficult passage many times until mastery is achieved (Tannhauser, 1999). This approach was initially proposed by Gruson (1988) who suggests that a major practice strategy is to divide a longer piece into shorter fragments, and concludes that fragmentation is the best way to practise. Other studies have refined this concept by suggesting that once advanced musicians have mastered separate passages, they tend to re-insert them into the context of the original piece by incorporating them into longer sections (Howard, 1982). This method of practising was described by Reubart (1985) as 'chunking': a process whereby we are able to comprehend ever more complicated and larger chunks of music as we gain greater knowledge of its component parts. Miklaszewski (1989) studied a single pianist at various stages of practising the same piece and found that the units of repetition grow longer as the piece is practised more, because complex works demand linking of consecutive fragments into extended sections. Jorgensen (2004) also supports this combination of the sectional and whole piece practice.

Listening to models of sound such as teacher demonstrations and recordings is another practising strategy (Gruson, 1988; Schleuter, 1988). Rosenthal et al. (1988) found that listening to a model alone, without an opportunity to practise, appears to be as effective as practising with the instrument in hand. This conclusion is supported by earlier research (Rosenthal, 1984), which detected consistently better results in the accuracy of advanced instrumentalists who rely on modelling as a practice strategy. These studies lend credibility to the Suzuki and other similar teaching methods, which are based heavily on imitation of the teacher and recordings.

A novel approach to practising was trialled by Burnsed and Humphries (1998). They swapped left and right hand parts in pieces for beginner pianists. After 10 weeks of instruction, the students exposed to this method performed better then students playing traditional right- and left-hand pieces. The findings support common beliefs that piano students need to focus more on the left hand when practising.

Another practice strategy is mental rehearsal: a "cognitive or imaginary rehearsal of a physical skill without overt muscular movement" (Connolly & Williamon, 2004, p. 224). Research has shown that mental rehearsal is an effective means of learning (Rosenthal et al., 1988; Pace, 1992). It can be used to enhance learning and memory, improve the effectiveness of practice, to master technical challenges and to intensify tonal production (Gabrielsson, 1999). Mental practice is particularly useful in the initial stages of learning when an overview of the work is being constructed and in the final stages of preparing the work for performance (Connolly & Williamon, 2004).

The question, which is more effective, physical or mental practice, has been investigated in recent years. There is no doubt that physical practice is necessary for superior psychomotor skill improvement, but can mental practice contribute to the development of skills? Both Coffman (1990) and Ross (1985) examined large groups of higher education instrumentalists using different modes of practice: physical, mental or combination of both. These studies found that physical practice in combination with mental practice is more effective than mental practice alone, and that the use of mental practice in conjunction with physical practice can produce many benefits for advanced instrumentalists, such as a reduction of practice time. In particular, performance of rhythms can be greatly improved by mental practice and silent analysis (Rosenthal et al., 1988). Tannhauser (1999) supported this view by suggesting that a conceptual, analytical approach is likely to enhance learning and practice time in instrumental performance.

Bruser (1997) proposed an alternative, holistic approach to practising. Her method integrates meditation techniques with body movement principles in a step-by-step procedure. This

consists of stretching exercises, settling into one's environment, improving basic posture and coordination, coping with difficulties and aiming at simplicity of solutions, listening techniques and understanding of structure, and, finally, focusing one's attention on the sensations of touch and movement. While this study is influenced greatly by meditation, relaxation and body awareness techniques, it does illustrate the use of such techniques in the context of instrumental music practice and offers many useful and practical suggestions to the frustrations of practice.

Self-regulation and motivation to practise

A study by Hallam (1997b) argues the benefits of *metacognition* when practising. This term implies a self-awareness of not only technical and musical elements of performance, but also of issues related to the learning itself, such as concentration, planning, monitoring and evaluation. Jorgensen (2004) supports this view by stating "a practitioner should explicitly diagnose his or her strengths and weaknesses in prescribing solutions to problems" (p. 95). To develop these skills in a young player, teachers need to ask students to "reflect on what they are doing, how they are doing it, and to consider alternative approaches" (McPherson, 2005, p. 29). Such approach is contrary to the typical instrumental lesson where a teacher spends most of the time giving directions instead of encouraging student reflection (Zhukov, 2006b).

Hallam (1997b) found that effective practice depends on the level of expertise acquired, with novice students using low level practising strategies, such as repeating the piece several times from the beginning to the end without stopping to practise sections that need improvement, and leaving errors uncorrected during most of the practice. On the other hand experts use high level practising strategies, such as playing through the work to identify difficult passages and then isolating these for further practice.

A metacognitive approach to practice has to be demonstrated by teachers during lessons, for instance by giving an overview of the work, identifying difficulties, providing appropriate strategies, integrating sections into the whole work, developing a monitoring progress by setting goals and evaluating progress (Hallam, 1997a). Hallam's results illustrate that the ability to monitor and evaluate one's progress is a fundamental aspect of effective practising. McPherson (1999) supports this view by suggesting that the quality of practice can be gauged by the level of a student's self-regulation and metacognition. He proposes a three-pronged approach to expand students' practising strategies: preparing for practice (setting manageable goals, drawing on past experience, considering alternative ways of playing, planning practice), monitoring progress/ correcting errors, and coping with distractions/ focusing on specific goals. These ideas can be implemented in studio teaching through discussion and modelling.

Students' motivation to maintain the frequency and intensity of practice is often related to their interest in a particular piece of music. This was shown to be true for both children (Renwick & McPherson, 2002) and adults (Lehmann & Papousek, 2003). This is why the choice of appropriate repertoire is of crucial importance in teaching. All too often teachers tend to assign a work because "it is good for the student" or because they have often taught this particular piece at this level, instead of allowing students to choose from a selection of suitable works something that interests them.

Parental influences and other factors contributing to practising

Parental support is essential to help students maintain regular, constructive practice. Research has shown that in the early stage of learning an instrument, parental attendance at lessons and supervision of practising is a significant factor contributing to the length and quality of

practice (Woody, 2004; Sosniak, 1985). Therefore, instrumental teachers should encourage parents to be present during lessons and take notes for home practice. Even non-musical parents can time the length of practice and comment if students are not following teacher instructions. Previous experience of playing an instrument, in particular by the mother, can influence the parental expectations with regard to the amount of practice (McPherson & Davidson, 2002). Parents with musical training need to be careful to avoid being too critical of their children's playing and too demanding of certain practice time as to not make practising a boring chore and an unpleasant activity.

Manturzewska (1995) showed that successful musicians came largely from families of professionals, with parents placing high value on education and encouraging the musical activities of their children. This confidence in and high expectations of success are strong motivating factors in maintaining student learning. The parents often made sacrifices and adapted their lives around the needs of their talented youngsters for the sake of their musical future (Csikszentmihalyi et al., 1993). The financial and time commitments made by families to support musical activities of their children provide them with validation of their talent. The extra attention given by parents and teachers to a talented young player acts as a strong source of external motivation (Woody, 2004). This is particularly important until mid-teens when internal motivation tends to become more significant. These studies indicate that parental support plays an important role in motivating students to continue with their musical learning.

Two important factors in helping students to sustain high amounts of practice over an extended number of years are regular music lessons and the amount of time spent with the music teacher each week (O'Neill, 1997). This is why regular sessions of consistent duration with an expert teacher are absolutely essential to develop a musical talent. Aside from practice, high-level musical achievers engage in many diverse musical activities, such as school-based music ensembles, orchestra programmes, church music groups and self or home initiated musical performances (Chadwick, 1999), with their individual practice including preparation of repertoire for such activities. Therefore, participation in extra-curricular musical pursuits tends to increase students' exposure to opportunities for learning, training and practice. Membership of bands and choirs tends to provide students with opportunities to demonstrate their musical ability and become part of a musical 'sub-culture' (Woody, 2004). The desire to receive social recognition in these groups serves as a motivator for increase practice. Identification with a musical sub-culture also helps students to become more autonomous in their pursuit of a music career and less dependent on parental emotional support.

Instrumental students, particularly in higher education, view practising as an individual activity. Nielsen (2004) suggests that to improve their learning strategies during practice they could include activities such as help-seeking (asking teachers for help) and peer-learning. This study highlights the need for music educators need to create an environment where students can ask their teachers for assistance and encourage students to participate in discussions with other students regarding interpretation and execution of a particular piece. In a private studio this can be achieved by asking a student at the end of a lesson to perform a piece for the following pupil and having a brief discussion. More formal sessions can be held with small groups of students preparing for the same grade examination, giving them an opportunity to perform for each other and exchange views.

Conclusion

The growing body of evidence on practising suggests that researchers are recognising this to be a very important topic in instrumental music teaching. Teachers have many new and interesting practising approaches/ techniques available to help their students achieve the desired results.

The studies on expert performance highlight the fact that expert musicians begin their music studies at an early age, continually increase the amount of practice as they grow older, averaging four hours a day over a period of ten years, differentiate between and participate in both formal practice and informal practice, and spend a great deal of time in a concerted effort to improve their playing. In addition to practice, high achievers tend to participate in many other musical activities.

Teachers need to tailor-make practising procedures to each individual student and review the structure of practice as the learning of a particular work proceeds. Clear instructions on what and how practice can save time and minimise frustration. Practising techniques shown to be effective by research are worth trialling even if they will not work for every student: introducing fresh ideas and approaches can re-vitalise both student and teacher about the learning. Above all, developing students' cognitive skills and self-regulation will lead to independence and self-reliance in learning.

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