Music From Another Room:
Real-time Delivery of Instrumental Teaching

Helen Lancaster
Queensland Conservatorium Research Centre
helenlancaster@iprimus.com.au

ABSTRACT

In music, practical training plays a significant role, and individual tuition is considered a critical element in the transmission of skills and learning. Delivery across distance therefore challenges traditional learning systems, assessment and quality management. To date, music learning between remote locations has generally been confined to theoretical units, effectively eliminating performance-based study for off-campus students, and isolating on-campus students from the opportunity to access advanced opportunities for tuition and mentoring across international borders.

Current innovative approaches to practical studies in music including real-time computer-mediated instruction, institutional partnerships, satellite and virtual operations, all offer potential for wider access to music training and performance. An increasing emphasis on student mobility points particularly to the application of real-time delivery across the huge distances of Australia and Asia. In the light of the ease with which students access interactive media outside the university, real-time delivery represents a challenge which is perhaps greater for the institutions than for the students.

This paper examines some current examples of distance learning in instrumental music at tertiary and pre-tertiary levels, outlining the more challenging implications for student and staff mobility, student recruitment, and faculty development.

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Introduction

Amid the contemporary blurring of boundaries between vocational and academic programs, the relationship between maestro and student persists as one of the most fundamental elements in music training. Forced with the argument that the Western classical culture on which they were founded is no longer central to music training, some conservatoria now incorporate a broader range of musical styles and others have specialise in new forms of training. Yet regardless of approach or genre, the provision of quality tuition continues to be important.

The context in which this quality tuition needs to occur continues to grow in complexity. In the USA, conservatoria face new funding guidelines which have them relying more on philanthropy than ever before. The Bologna Declaration has required European conservatoires to conform to a unified system of assessment and quality assurance which encourages mobility for faculty and students (Lancaster, 2004). The Higher Education Funding Council of England now requires institutions to ensure broadening access and successful graduate outcomes (Lancaster, 2006a). In music, access at tertiary level is highly dependent on prior experience, and thus the matter of quality tuition extends beyond the higher education sector and into the wider community. Graduates, and members of the wider community they join, deserve access to lifelong learning which enhances their experiences in a fast-changing world.

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Australian conservatoires have been forced into shotgun marriages with university partners, and many are now obliged to engage in globalisation and flexible delivery (Lancaster, 2006b). Many countries are developing mass-delivery models for higher education, opening the door for and to students in fields other than music. Parallel with rapid economic expansion, there is phenomenal growth in the number of distance learners in Asia (Jegede & Shive, 2001), yet Western music institutions currently have access only to those who can afford to study overseas.

These issues point to new approaches in delivering tuition of varying kinds across a wider audience, before, during and after tertiary training. Yet most music institutions operate in a climate of economic rationalism, which challenges them to justify their preference for individual tuition whilst searching for ways to address the evolving needs of potential students (Lancaster, 2006a).

The need to address flexible modes of delivery cause music institutions to question their original raison d'être: is it possible to deliver training in the most essential element - music practice - from a distance? Thirty years ago, the suggestion would have been considered implausible. Now, in this climate of internationalisation, shifting funding guidelines, broader access, and students who consider technology commonplace, the concept would seem relevant to institutional objectives and student needs. Progress, however, remains tentative at tertiary level, generally restricted to study units which are not practice-based. Building on foundational research by Callinan (2000), this study examines some of the examples which are breaking new ground in offering music

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learning experiences from a distance, and suggests ways in which they might be applied to meet evolving demands in the contemporary music institution.

In recent years there have been some developments in flexible delivery modes among music providers in various parts of the world. The most significant of them include computer-mediated learning in real-time, collaborations between institutions to deliver joint programs, satellite campus and virtual operations. This paper focuses primarily on synchronous delivery by videoconferencing, analysing examples which demonstrate its benefits and shortcomings.

The reluctance to deliver music learning experiences via interactive technology is easily explained. In most tertiary music institutions, performance-based music programs are predicated on the expectation that instruction includes a high percentage of one-to-one tuition and ensemble performance. In the main, this is the context of traditional training in Western music forms, a context in which training from a distance is generally deemed impossible. However, this conventional focus not only ignores the argument that future musicians will need to be able to adapt to a range of contexts in order to connect to their audiences (de Haan, 1995; Gregory, 2002), more importantly it overlooks the technology-savvy student, and the evolving role of technology in the artform.

Recent developments in interactive musical composition and performance on the Web demonstrate quite clearly the potential for creative activity in real time across unlimited locations. Composer William Duckworth describes his interactive composition *Cathedral*

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as “almost unimaginable, and certainly physically impossible, a mere decade ago” (Duckworth, 2000). An interactive website with web-based musical instruments that anyone can play, this piece blurs the distinctions separating composers, performers and audiences, offering each individual listener the ability to create his or her own unique musical experience online (Duckworth). That this web-based performance is non-elitist and accessible to anyone without audition demonstrates the relevance of this technology to broader access and the wider audience.

Not all real time performance is non-elitist. In recent years, McGill University in Canada has been developing both interactive teaching and performance, and claim to have produced the world’s first demonstration of high quality internet protocol performance in a violin duet presented in 2001. Separated by several kilometres, the two players were able to hear one another in “near real time” with approximately 20ms delay, allowing them to synchronize their playing as if standing together on the same stage (McGill).

Research of this kind coupled with recent advances in videoconference technology unlock significant potential for music institutions to address some of their contemporary challenges: encouraging increased mobility among faculty and students, improving access to and for students before, during and after their tertiary training, and increasing opportunities for institutional and international collaborations.

The real time videoconference (VDOC) link via Internet Protocol (IP) is fast, efficient, cheap and accessible. Videoconferencing is defined by the nature of the communication,

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not by the technology it applies. Although different types of equipment and different means of connection are used, they are all termed 'videoconferencing' because they connect sites with vision and sound in real time (Callinan, 2). It has been present for many years in live television crossovers. In some countries, universities and colleges have applied VDOC technology to link campuses in different locations with a single lecturer on another (or even the same) campus. Because this has happened whilst the technology has been developing has given it a difficult birth, particularly in music-related activities. Those universities employing early versions of VDOC technology were often frustrated by slow response rates and poor audio and visual qualities. The first few who tried to apply it to music teaching gave up very quickly. An enthusiastic but brief trial of instrumental lessons delivered from Sydney teachers to Armidale in the early 1990s were frustrated by slow, insecure and expensive connections. The few visionaries who have persisted have had their faith rewarded. Now, the connections – at least in that location – are very fast and efficient. For those young music students who occasionally access specialist teachers in other locations, it is an effective alternative to travelling long distances for a lesson. Certainly, it is better than nothing at all (Walton).

An enthusiastic proponent of VDOC technology, violinist Pinchas Zuckerman often uses it to maintain contact with his students at Manhattan School of Music when he has commitments elsewhere (Brand, 2004). He also participates in distance masterclasses with other institutions, including McGill University. Zuckerman is very positive about the medium:

> I can see a student's fingering up close, analyse the problem and then send them fingerings and bowings with live graphics. This provides the student with […]

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> follow-up. It's not just a one-time thing because the lesson can be reviewed when it's over, and in several weeks I can come back and see if and how his playing has improved. (Cary, 1994)

Together with projects at Oklahoma University and the New World Symphony in Florida, Zuckerman's support of the medium demonstrate that "videoconferencing can be used successfully to teach [instrumental] music, conduct masterclasses and produce collaborative performances" (Callinan, 16). Supporting the American examples is very high broadband technology available through Internet2 (www.internet2.edu/), a facility which underpins various projects across a consortium of universities and institutions. Illustrating the versatility of the medium, these projects include

> A performance event showcasing regional dance and music from numerous campuses; […] musical theatre with 'Broadway Local' in which students at Manhattan School of Music and Columbia interacted with Oklahoma University to perform; a music masterclass and discussion; […]; the Remote Barbershop Quartet; […]; a musical linking performers in Troy and Manhattan into a single musical presentation; [… and] Pinchas Zucherman teaching a violin student in Canada (Internet2 website, in Callinan, 16-17).

In October 2002, performers from McGill University and Stanford University in California created a world first with a cross-continental jazz performance. This performance spanned the continent as they played together using the Ultra-videoconferencing system which has been specifically developed at McGill as a "low-latency IP transport system for audio, video, and most recently, vibrosensory data". Since 1999, they have used the system in live concert streaming, in remote mixing, collaborative performance, distance master classes, and remote video interpreting of sign language (McGill).

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Australia may have a long history in distance education, but it lags behind the USA and Canada in the delivery of real-time instrumental instruction and performance in the higher education sector. The belief that face-to-face contact is "still highly desirable, and "a range of offerings would lose out if delivered in an on line, no contact mode" (Whateley & Bofinger, 2002).

There has been some progress. In September 2003, a live concert held in Verburgghen Hall at Sydney Conservatorium was delivered via VDOC to Perth (Western Australia) and Armidale (NSW). Using large bandwidth for fast delivery of high quality, made it possible for audience interaction between all the sites after the concert. This demonstration was produced by the CSIRO to demonstrate the potential of interactive performance across remote locations. Although the event did not sufficiently impress tertiary music institutions, such examples endorse the conviction that "the issue for the twenty-first century will not be whether to use technology and multimedia in music teaching, but how to use it effectively" (Uszler, Gordon and Smith, 2000).

The message is not getting through. Prior to this event, Sydney Conservatorium had been host to the *VideoLink* learning project, established in 2000 by Mark Walton in response to the need for regional students to have early and regular links with quality teaching from Sydney Conservatorium. Frustrated by constant travelling in his independent efforts to reach remote students on a regular basis, this clarinet teacher from Sydney Conservatorium single-handedly found sponsorship to set up a real-time teaching link between the Conservatorium and regional centres across the State.

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VideoLink makes it possible for teachers in Sydney to provide individual instrumental instruction via VDOC to students in remote locations. The greatest advantage of the concept is that it provides access, removing "some of the problems of isolation experienced in regional New South Wales: and [reducing] some of the distinctions that exist between city and country areas" (Callinan, 151). In most cases, the students are pre-tertiary, and VideoLink is therefore an effective means of improving the size and quality of future Conservatorium intakes, making it an important asset for the Conservatorium. As a prime investment, the project was been of little cost to the institution - a single room at the Conservatorium houses the computer, camera and monitors supplied to the project.

Callinan found that having a lesson with a teacher from Sydney Conservatorium highly motivates the students involved (151). Despite this potential for developing pre-intake interest, the project relied on Walton's availability until his departure (in 2006) and is used now only on occasions by a few believers.

As Walton was to discover, establishing the technology was the easy part. Converting teachers to the concept was more difficult. Concern regarding teacher commitment caused Walton to include students in his work, training them to provide VDOC tuition to regional students. By doing so, he has already developed a new generation of teachers accustomed to the medium, and some are now teaching in remote locations. For those now working in regional centres, using VDOC with their students has the additional benefit of an ongoing mentoring relationship with Walton. Jenny Binovec in

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Coonabarabran is a former student of Walton's now teaching in Coonabarabran. She says of the system

> Its [sic] really great that we have the resource available to regional areas where visits by brass teachers and/or examiners are not frequent and it cuts out the travelling time of 7 hours from Sydney! It is a great opportunity for my students to experience expert advice from various people. Also my younger students (primary) are captivated by the whole process - the technology, the screen, volume and zoom control.

One of the most VDOC-proactive of these regional centres is the Riverina Conservatorium, a pre-tertiary community school located in Wagga Wagga, 475km south-west of Sydney. The Riverina Conservatorium has taken the VideoLink project one step further by employing it at two levels – to link advanced students at the Riverina Conservatorium with teachers at Sydney Conservatorium, and to connect staff from the Riverina Conservatorium with students in remote areas beyond the regional base. Moreover, whereas Walton commenced VideoLink using wind and string teaching, the area most developed at the Riverina Conservatorium is piano. In 2006, VDOC was used to examine some students in another remote location, Coonabarabran, 465km north-west of Sydney.

Director of the Riverina Conservatorium, Hamish Tait is determined to further develop the technology and the accompanying pedagogy. He confirms that videoconferencing via an IP address is economical to install, operate and facilitate, and teaching in this way reduces costly travel time which allows teachers to access students in remote locations without leaving the Conservatorium. Some are in the town of Hay which is 300km west of Wagga, where "there are no, I mean no, music teachers within 150km of [that] town",

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and “at least two guitar students, a handful of clarinet/sax students and several brass students” benefit from studying with teachers at Riverina Conservatorium via VDOC mode. At the other end of the spectrum, advanced students at Riverina Conservatorium have regular access to the experience of such teachers as Mark Walton (clarinet), Jeanell Carrigan (piano), Phillippa Paige (violin) and Emma Knott (flute), all teachers at Sydney Conservatorium.

Rather than confront the challenge of VDOC technology, those Australian music institutions which choose flexible alternatives in delivering programs have instead made progress in other ways, developing partnerships between institutions, satellite campuses and in one case, a virtual operation.

Such music programs have the potential to provide access to a wider population of music students, and encourages lifelong learning among those who might otherwise be unable to enrol. Lifelong learning “is an important conceptual framework for the improvement of people’s employability and adaptability.” One of the most essential characteristics of lifelong learning is “diversity in learning activities and learning culture at an individual level” (Smilde, 2006).

Lifelong learning offers the contemporary music institution a range of opportunities, some of which have historically been associated with conservatoriums – early childhood music programs and individual tuition to students of all ages are two ways in which they scratch the surface of lifelong learning experiences. Contemporary views suggest that

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music institutions have a responsibility to adapt to the evolving workplace into which their graduates have moved: their portfolio careers "might now include cross-arts, cross-cultural and cross-sector work" (Smilde).

Alongside lifelong learning, the parallel development in open education across Asia offers another strong foundation on which to build digital learning experiences in music. As Bates explains, "there is real value in adding synchronous technologies to distance learning. For instance, when students are working on collaborative assignments, they often want to get together at the same time to finalize their assignments" (2004). This comment opens the VDOC concept to more than instrumental (or vocal) instruction, and maximises the impact of the technology across various conservatorium-style programs. Areas of study like music technology lend themselves particularly to developments in synchronous learning, whether by VDOC, or by online link.

> Computer-based learning provides efficient, effective delivery of educational content. It can offer students, who might not otherwise have access, the educational experiences and credentials necessary for employment advancement and personal enrichment. … Such achievements are possible through computer-based distance education if educators, their institutions, and the governments and foundations that support them direct their attention and resources effectively" (Tysseling, 2004).

The growth of distance learning across Asian countries coupled with an economic resurgence and improved access to computer technology open the field to development of music learning experiences across borders. Where such access is available, one might envisage Zukerman-style masterclasses across continents, which might establish long-term connections with international students who might eventually enrol full-time on campus in Australia. The back door connection in Asia is the strongest of them all.

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However, just as technology may opens doors, so too might it act as a barrier. Technology may be moving quickly across global spaces, but there is yet to be a standard common to all. Tait notes that "internet based VDOC is the best option providing the bandwidth of the internet connection is fast enough [and there is] a symmetrical connection with equal upload and download capabilities." Experienced VDOC educators suggest that no matter what brand of equipment is installed, all sites should be the same because the same equipment gives seamless interactive technical fit, resulting in better resolution picture and audio. Different brands of equipment have different menus and this may cause problems for teachers and students using different systems (Smith). As Tait confirms, "the internet option is only applicable if both ends have similar connections. The system will only work as well as the weakest link." The major limitations for regional Australia are the cost of equipment and the availability of broadband. Whilst more readily accessible than fast broadband connections, ISDN is "extremely costly to use."

Despite the potential hazards normally associated with technology, most difficulties experienced by VideoLink relate to pedagogy. Teachers are the crucial element: "you need a certain type of staff to make it work, that's the greatest threat, there needs to be a shared understanding and enthusiasm for it" (Voltz, 4). Callinan found that because of the more extensive time involved in prior preparation and follow-up, teachers need to be extremely committed and prepared to change their teaching approach to suit the medium. They need training in details and teaching modes specific to the medium, including the

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ability to communicate effectively in concise sessions: “clarity of verbal communication [is] very important in this situation” (Tait and Blaiklock, 4). Eye contact is particularly important in reducing the sense of isolation, and it can be easily achieved by directing attention at the monitor above which the camera is situated. Interactivity and building relationships between teacher and students is critical to the success of a VDOC program. Binovec explained the limitations for Sydney teachers in developing a rapport with students in Coonabarabran:

> Having someone on a screen for a student can seem rather distant for them and unconnected, especially if they have never met this person "face to face". I feel the teacher on the other side [i.e. Sydney] needs to work harder to make the lesson work.

It stands to reason that all users must be familiar with the technology (Callinan, 2000; Searle and Mandile, 2003). Beyond that, teaching via VDOC requires intensified perception from the teacher: “teachers using videoconferencing [need] to have a high skill level and be very experienced in teaching to enable them to deduce what the videoconferencing does not allow them to fully assess” (154). They need to adapt to the physical differences. Referring to piano teaching for example, Tait and Blaiklock note a lack of ability to view the student from a 360-degree perspective, requiring the teach to “develop methods of determining from a single viewpoint how the student is sitting or whether the opposite hand is positioned correctly” (4). The Riverina Conservatorium employs a Polycom VDOC system, and this comment assumes a single camera on the student, normal to most situations. Recent alternative systems such as those developed by Tandberg have improved camera rotations to almost 360 degrees (Siefert). Nonetheless although the camera range may have restrictions, picture quality is very high. Tait and

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Blaiklock note that teachers are able to zoom to a close view of the student's score, fingers and even fingernails (4).

Research confirms that "power distance" may increase by magnifying the teacher's image on screen (Filipczak, 1995), so placing the teacher's camera needs careful consideration. Use of the zoom feature may be necessary when the teacher is demonstrating to the student, but Walton suggests that the less a student is required to think about the technology, the more effective it is. He recommends that someone else is with the student (perhaps the local teacher) to make adjustments. The Conservatorium teacher is able to adjust the view of the student remotely (without the student being aware of it) to obtain a closer view of their posture or movement. Because of potential restrictions on visual stimuli, Tait and Blaiklock note that "the need for aural information [is] much greater" (4).

Sound quality is "critical to the success" (4) of VDOC programs for music lessons. Audio quality in contemporary television speakers is now better than ever before, but it is possible to further enhance the sound by incorporating high quality microphones and audio speakers into the system. Without high resolution speakers, the sound may be "far from perfect", limiting demonstrations (Binovec). Binovec explains that with limitations like these, the Sydney teacher may not hear whether the student is tonguing properly, whether the student might be flat or sharp (as opposed to distortion of the sound), or if their tone is harsh (or if it is only the speakers). As she explains, "Sometimes its hard to tell" [sic].

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Delays may occur to the connection speed if ISDN is being used. Where they occur, delays in transmission complicate the pedagogical challenges. As Binovec explains, with any delay "the teacher is unable to beat the time, play duets, so there has to be me (or someone else) on the other side to do these things." On the other hand, with fast broadband connections like those at the Riverina Conservatorium, "this delay is naturally overcome and students are rarely bothered by it after the first minutes" (Tait & Blaiklock, 4) and there are "no pedagogical disadvantages to either student or teacher" (Tait). Either way, despite technical limitations, Binovec still insists that "the system works very well and is a definite benefit."

Whilst demonstrating the effectiveness of tuition using real-time technology, the VideoLink program nonetheless continues to maintain the importance of interaction without technology. Apart from the local teacher's involvement in the VDOC lesson, this model also intersperses videoconference tuition with occasional face-to-face encounters with the specialist teacher. Ideally, neither mode should be exchanged for the other: videoconferencing enhances traditional instruction (Callinan, 2000).

The greatest challenge in this concept is overcoming a traditional mindset, or the firewall "of the mind" (Coghlan, Fox and Finkelstein, 2003). Even if there is increased acceptance of interactive modes, teachers still need to adjust their pedagogy. Another significant firewall is that which protects the traditional musical forms. VDOC lends itself to greater diversity in music training, giving the next generation of musicians the option of

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preparing for a different kind of professional future. It allows flexibility to move beyond the firewall which shields traditional styles. Interactive opportunities already available demonstrate the opportunity for experience on an individual level, tailored by the learner as well as the teacher.

The future for training in music must recognise the emerging role of technology not only in delivery of the training but also in creating the art. Both transform the traditional approach to training performers: VDOC makes a performance degree a possibility for students in remote locations and it has the potential to transform the way musicians perceive their work. The new generation of performers may find that learning from a distance in the digital age allows them a flexibility which transforms their access, their development, and their artform.

The new technology unlocks many possibilities for the future. In a moment of radical conjecture one might imagine a virtual provider offering a supermarket of program options and delivery modes across borders and cultures, some of them in collaboration with existing institutions elsewhere in the world, some with professional organisations linking students to industry prior to graduation. In a more immediate scenario, a promising performer might connect with a maestro elsewhere in the world for regular tuition, and with like students in another conservatoire. An orchestral student might be linked with a professional organisation, creating a transition into the industry after graduation. A contemporary musician, might have his music linked to online production long before graduation. Cooperation is possible across cultures, countries and artforms to

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extend the experience of performance and composition students. Programs might encourage staff and student mobility, allowing participants flexibility to reside nearby or afar at different times during their study. Mixing the media appropriate to the individual project and the available resources allows unique programs to develop for specific needs.

Although most proponents of videoconferencing currently see it as "an enhancement or supplement to face-to-face teaching rather than a replacement for it" (Callinan, 18), it is impossible to predict its future potential. For the moment, in locations like the Riverina Conservatorium and Coonabarabran, it makes a huge difference to students and teachers, and a significant contribution to the size, quality and adaptability of the future tertiary music pool.

Author:

Helen Lancaster is former Foundation Director of Central Queensland Conservatorium of Music and the International Academy of Music (Bangkok). Currently freelancing, she is an adjunct member of the Queensland Conservatorium Research Centre.

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