APAN Conference presentation

August 11th 2010

In 1998 the Royal Children's Hospital, Melbourne established a department called RCH International, (known as "RCHI") to build links with hospitals in the south-east Asian region and to manage philanthropically-funded international child health development aid projects. These projects mainly focus on capacity building through education and training.	
Following the Asian tsunami in December 2004, RCHI collaborated with World Vision, the University of Melbourne's Nossal Institute for Global Health, and the University of Gadjah Mada in Indonesia, to deliver a 3-year reconstruction and development project to the devastated Indonesian	

province of Aceh.	
RCHI is currently responsible for managing and providing two major training projects in Vietnam: a 3-year, $5.3 million Education and Training Project at the National Hospital of Pediatrics in Hanoi; and a 5-year cardiovascular training program for 111 staff employed in a new cardiovascular centre built at Hue Central Hospital.	
Project management for all three projects involved at the highest level, a Project Management (or Steering) Committee, with representation from all participating agencies, and a Project Management Unit to implement activities in-country. Initially communication between parties required a great deal of international travel. After everyone had got to know everyone else, we started to hold some meetings by telephone hook-up. Connections were	

often poor and discontinuous. Once we became aware of the TEIN2 network's existence, we used broadband internet and held many of our meetings by video-conference so that those unable to travel could participate. This has only been possible at Hue very recently as the hospital there does not have a video-conferencing set up. Their staff had to go to another institution to take part and we had to pay high rental fees. Generally speaking, video-conferencing is much better that telephone hookup meetings because you can read the facial expressions and body language of the people you are addressing, and you can see who is in the room. The sound quality also tended to be better.	
Having become confident with broadband for communication, we decided to experiment a bit. On one occasion, we invited an audience in Hue to	

participate via broadband in a Grand Rounds session held at RCH in Melbourne, facilitated by AARNet and VinaRen. Members of the Hue audience were able to ask questions of the speakers and to give part of the presentation themselves. Unfortunately, despite carefully rehearsing everything over the weeks leading up to the Grand Round, the audience in Hue was not able to see the Powerpoint presentation of the speaker in Melbourne, and we could not see theirs. Fortunately they had sent theirs through in advance, so we were able to play the file through our own computer. We think the problem related to the different types of video conferencing equipment at each centre.	
We then decided to try using broadband to deliver lectures to our trainees at the Hue Cardiovascular Centre. We were assisted in this by Dr Duncan	

Stevenson, an IT engineer who had previously worked as a senior researcher in the IT division at the Commonwealth Scientific and Industrial Organization in Canberra.	
Our brief was to deliver a series of postgraduate-level lectures in paediatric cardiology from RCH, Melbourne, to an audience of doctors at Hue Central Hospital, Vietnam, as part of a wider postgraduate training program. The first set of 15 lectures was to be delivered using existing videoconference equipment at RCH and at the university in Hue. The existing Internet connection linked RCH into AARNet, then into Vietnam on a broadband link, then to Hue University at 20 megabits/second. The existing equipment consisted of older-style Polycom videoconference systems at RCH and Hue and an older-style Sony	

system at the NHP in Hanoi, where we experimented initially with a multi-site presentation to both Hue and Hanoi. Lectures in highly technical subjects, such as cardiology, differ from the underlying face-to-face dialogue model of videoconferencing in that they have a strong focus on content. In our case that content included photographs, images, animations and video clips. This was delivered using the lecturer's laptop connected to the videoconference system via a scan converter, which converted the computer screen format into a video-signal format. This raised several problems:	**Slides 1 & 2, then blank slide**
• Even though the videoconference link was operating at 2 megabits/second the older-style videoconference systems did not have the	

computing power needed to match the spatial and time resolution of the content from the laptop.	
• The lack of support on the videoconference system at RCH for native laptop screen input (which therefore required the scan converter) degraded the spatial quality of the images and videos further.	
• It was very difficult for the lecturer at RCH to judge the quality of the videoconference presentation to the audience and, in particular, to judge whether the animations and video clips were being seen at an adequate frame rate and spatial resolution for their content to be understood.	
• During testing for the first lecture we found that even though the three videoconference	

systems involved (RCH, Hue and Hanoi) could in principle handle both the face-to-face video conferencing and the content channel from the laptop in the one session, in practice there was an incompatibility that prevented automatic use of this capability.	
We took advantage of a field trip to Hue which included one of the lecturers to test-run segments of his first lecture from RCH to Hue so that he could assess the received quality of the laptop-based content of his talk. In dialogue with the technical staff at RCH we were able to fine-tune the presentation of this content to give a satisfactory result for subsequent lectures.	
These photos show the degraded quality of the powerpoint components (video, animations, ultrasound) as seen in Hue - supporting the point that	**Slides 4 & 5

older videoconference equipment does not properly handle the content material needed for this level of technical lecture. The 3-way screen* shows that the video camera component is better than that from the laptop, probably due to the lower screen resolution available for the laptop screen. During the first few lectures we noticed a number of issues that arose because we were using a system that was designed primarily for face-to-face interaction between small groups but we were using it to support a one-to-many lecturing environment.	***Slides 6 & 7, then blank slide (8)**
• The videoconference equipment was able to present a view of the participants or a view of the content from the laptop but not both simultaneously. For the lecturer, this limited	

his ongoing visual feedback of the audience and made it difficult for him to cue questions about their understanding of particular points to the audience. Use of the "picture in a picture" facility showed him a thumbnail view of his audience and this was useful in later lectures where there were fewer attendees.	
• These* show the setup for lecture 3. The lecturer was able to see a "picture in a picture", i.e. the small image of the other end in the bottom right corner*. When Professor Wilkinson was talking to the audience he could only see his own slides on the full screen* but he could see them in the small picture*. This was (almost) enough for him to monitor what they were doing and for him to see a doctor in Hue answering progress questions put to the	*Slides 9-11 *Slide 12 *Slide 13 *Slide 14

audience*. Prof Wilkinson used the mouse*to point to features of his powerpoint slides and used the video controller* to flip between the laptop screen and the video camera view of himself.	*Slide 15 *Slide 16 *Slide 17
• During question time the audience preferred to speak from their seats with a hand-held microphone (rather than come to a central lecturn). This required the role of a video director to zoom and pan the camera at the audience's site to bring the person asking the question into view.	•
• Accepted wisdom is that the audience would mute their microphones during lecture segments, especially in multi-site presentations, so that echos be kept to a minimum. A better	•

solution for our situation was to use equipment with built-in echo cancellation so that the microphones could be kept open. We borrowed a modern videoconference system for the third lecture and the ability of the audience's leader (who spoke fluent English) to respond to the lecturer's questions in the natural timing of a dialogue was noticeable.	
We can conclude from these early lectures that successful delivery of highly technical lecture material to a remote audience can be delivered over a modern videoconference system provided that:	
• There is seamless connection between the sites, with minimal involvement of technical staff	•
• There is support at close to the native screen format for laptop input	•
• There is hardware support for echo cancellation	•

These are features of modern videoconference systems, which are designed to be reliable and easy to use and which have the computing power to deliver high-quality face-to-face and content channels over modest bandwidth (for example, 2, 4 or 6 megabits per second).	