

# Being there: Exploring extending and enriching distance learning and teaching with WEBEX

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*Until recently, real time multi-media interactive teaching and learning among on-campus and distance learners in tertiary settings have often been sidelined in deference to the convenience and cost effectiveness of either fully face-to-face or fully 'distance education' mailed out packages, occasionally supplemented with asynchronous web based learning support systems. While asynchronous online systems strongly enhance the experience of distance learning and teaching, synchronous interaction among on-campus and distant learners remains under-explored for its potential contribution. The use of web based real time meeting/training systems such as WEBEX, has promising possibilities that may be able to promote another synergistic effect through the 'in the moment' interactivity that is different again from asynchronous modalities. While corporate use of such systems is well established, the multi-media web based functionalities such as that provided by WEBEX that are accessible from lower bandwidth connections are only now beginning to find their place in tertiary education institutions around the world. However addressing the technical, pedagogical and financial complexities of creating a virtual presence for distance learners so that they may enjoy fully supported interactive learning with their on campus and distant peers and instructors can be daunting. Audio only solutions and bandwidth hungry video conferencing capabilities have been available for some time. The Monash Education in the context of its new Master in School Leadership is trialling WEBEX as a resource effective accessible web-based means of real time connecting on-campus learners with their far flung colleagues across Victoria. This paper reports on some early findings from our trials of this system and signals some themes found to be worthy of further study.*

## Background

### Project specific aims

Collaborative learning technologies are being researched and deployed in various educational institutions worldwide, in the pursuit of more student-oriented interactive learning environments supported by collaborative technologies. Desktop and teaching space videoconferencing as it is currently deployed (incorporating voice, video, and data sharing) is viewed as the most ready and most approachable 'collaborative environment' available. As such, it forms a logical technology on which to base various types of collaborative distance learning, access grid research, multicast videoconferencing, web casts and on-demand video streaming and research collaborations.

This project was designed to learn from initial trials in the innovative delivery of the Monash Education Master in School Leadership and other delivery settings, to achieve an increasingly fine

grained understanding of WEBEX as a teaching and learning support system within the Faculty of Education. The early trials of the system were focused on feedback from participating faculty members and students as we enlisted their assistance in identifying key issues for further inquiry. The key question is how does the use of WEBEX affect teaching and learning?

### **Relevance to tertiary education, interactive distance education, technology leadership**

Learning occurs through the dynamic integration and generation of new knowledge supported by social interaction (Vygotsky, 1934/1987). While asynchronous solutions have assisted in bridging communication distances, the immediacy and synergies in real time interactive connectivity are distinct from asynchronous processes. This potential would not wisely be ignored as we seek to optimise connectivity in all aspects of tertiary life including distance education. Synchronous systems make it possible:

on the one hand for larger numbers of people to share a common learning experience in real time, or on the other, to enable an individual learner to have a unique personal interaction with a teacher or with another learner, no matter where located, [and] will increasingly be available on a common platform as bandwidth limitations become less significant ... [enabling the] crucial component of all education which is the interaction between teachers and learners, and, where possible, between learners ... as new technologies allow the organization of 'virtual groups'. [This is] the fastest growing approach to distance learning. (Moore & Tait, 2002: 26-7)

Yet pedagogical, technological, organisational and cost related challenges can compromise chances of success if the challenges are not thoroughly understood.

In recent years, even though several US universities have begun to integrate WEBEX and systems like it for researchers and to support learners as they interact with instructors and other learners, still, the complexities of adjusting approaches to teaching and integrating the technological demands of operating such systems between larger groups of students continue to detract from the wholesale uptake of this technology for tertiary distance teaching, as asynchronous approaches continue to dominate. As the ease of synchronous connectivity improves however, this pattern promises to shift to one which will include synchronous web based learning as a complementary element in a suite of converging technologies, as the race to increase the market share of national and off shore distance education provision heats up. The best providers of these distance learning opportunities will be those who are most fully informed, equipped, experienced and prepared for managing its unique challenges. The study addresses an information gap.

Learner centred interactive teaching is inherent in asynchronous web-based discussion forum supported distance courses. Issues surrounding dynamic interactive learning of any kind can pose challenges for instructors in the design and implementation of their work with students (Wilson et al., 2004). When synchronous online multi-media elements are added to groups of on campus learners, instructors need to design and carry out interactive approaches (Parker, 1997). However, as Parker, (1997, p.9) cautions, 'The medium too often assumes a life of its own, supplanting the teacher and resulting in technology-bound activities that are debilitating to both teaching and learning'. Engagement remains key (Hedberg & Ping, 2001).

Distance learning with any online/web-based system requires adaptation of teaching approaches, especially if full use is to be made of the various communication-enhancing features. This requires additional preparation, and a departure from traditional lecture approaches in order to plan for and successfully integrate its interactive potential. We are studying these factors as they are associated with WEBEX and how they come to bear on instructors' efforts to achieve success in their instructional 'delivery'.

While on the surface of it, the ability to bring in distant learners may seem fiscally attractive, we need to know how such learners are experiencing these real time learning situations. What is

involved for teachers and students to 'learn to learn together' in this way, as they engage with students in distant and on-campus locations for instance, or hold virtual group work sessions in the middle of a class, and then rejoin the larger group? A variety of adjustments is essential if student engagement is to be achieved (Bangert-Drowns, 2001), and maintained (Kearsley & Shneiderman, 1998). These issues are true of asynchronous systems and even more critical in synchronous arrangements as the moments for engagement are fleeting, and opportunities for meaningful interaction even more 'timing sensitive'.

Tertiary education organisations are beginning to realise the importance of knowledge management as they adopt new e-learning systems (Inglis, 2003; Barron, 2001). The interaction between technologies techniques and people in the context of organisational knowledge management is complex (Bhatt, 2001) and demands a unique set of considerations for synchronous systems like WEBEX, precisely because of their appealing business potential (Business Times, 2003). Recent studies of technology uptake in the secondary school system suggest the importance of technology leadership (Anderson, 2005). This theme will be pursued further in final reports on this study. This paper will focus on the first year of WEBEX use primarily in the context of the Monash Education Master in School Leadership.

## **Methodological approach**

### **Premise for the study**

The use of information technologies and systems in support of knowledge management, individual and socially distributed cognition, decision making, and learning has a short history that is chequered and problematic, as might be expected in the context of new information and communications technologies, and the development of emergent and relatively unknown possibilities for their application. In this regard, most research interest has been in the fields of knowledge management and organizational learning. Interest in the application of real time information technology systems to teaching and learning in tertiary education, is a relatively more recent development. Analysis of the issues in the field of knowledge management, which include organizational learning/learning organization as sub-components, is informative for studying these technologies in the context of tertiary education.

### **Conceptual framework**

A critical issue with respect to knowledge management has centred on distinctions between information - which includes data, and their communication and utilization via information technologies and systems - and knowledge: its creation, diffusion, acquisition, and application. In particular, information flows are not seen to be the same as knowledge flows (Tiwana, 2000, p. 64). Awareness of this has stemmed from a conventional focus in the field on a rather narrow and problematic techno-centric conception of knowledge management, which has emphasized the value of codified forms of knowledge as information (see Malhotra, 1997; McDernott, 1999; Spiegler, 2000). Missing from this view has been a broader dynamic conception of knowledge as embodied in individuals and extended into social, emotional, institutional, technological, and cultural complexes.

This richer view of knowledge moves beyond explicit forms of knowledge as rather static and abstract codified representations, which require active interpretation and contextualization for their application and use, to an understanding of knowledge as a uniquely human experience, which is much more immediately implicit or tacit in its properties, and which is characterized as more procedural and practical in nature. Such knowledge is often described as 'knowing-how', and as manifested in finely calibrated perceptual and motor skills, which lie in sharp contrast to a 'knowing that', or declarative, view of knowledge. Hence, epistemological issues concerning the nature of

knowledge, mind, cognition, and learning are profoundly intertwined with questions concerning the management of human knowledge and its growth (Allix, 2003; Beatty, 2002). This methodological point extends naturally to questions concerning the relationship between technological systems and their employment as effective communication and learning tools. There is, therefore, a growing awareness in the field that managing human knowledge and learning is not simply a technology or information management problem, but is rather a much more complex socio-technical and cultural process issue that is centred more on using information technologies and tools to promote genuine social interaction, intelligent collaboration, and active and dynamic learning (McElroy, 1999; Tiwana, 2000, pp. 10, 53, 58; Wick, 2000, pp. 517-518; Beatty, 2002).

The effects of WEBEX supported delivery approaches will also therefore be considered in terms of shifts in embodied, physically embedded (situated) and (technologically) extended perception and action (see Hirose, 2002; Clark, 1998, 1999; Clark and Chalmers, 1998), and emotional epistemological perspectives (see Beatty, 2002; Dolan, 2002; Damasio, 1996). Of particular interest in this context, is WEBEX technology's ability to facilitate social construction of mental representations and information processing (socially situated cognition), in ways that go beyond what isolated individuals are able to do (see Semin and Smith, 2002, p. 389).

Of most significance in this regard is finding ways of integrating information systems and technologies intelligently with human cognitive and emotional properties in support of collaborative knowledge creation, sharing, and utilization processes (see Lueg, 2001, pp. 151-159). Issues and problems associated with 'real-time knowledge management' (RT-KM) (El Sawy and Majchrzak, 2004) and the discovery of effective and workable solutions will therefore be of foremost interest in this research. Central to this is finding answers to challenges such as how best to manage the dynamics of emergent knowledge creation and learning, and its integration and coordination with the multiple, distributed, and evolving embodied/emotional and situated cognitions and actions of other agents.

## **Sample and sources**

Students and instructors associated with the WEBEX trial were invited to comment on their experience with the system. Observation notes, anecdotal comments, and unit evaluation feedback, along with focused discussion among three sub-group representatives from among participating MSL students, have provided the sources of information for this paper. The following themes and an openness to others that might emerge provided us with a structure for analysis and presentation of results.

## **Research focus**

We were looking for signs of:

- Shifts in epistemological perspective (e.g., Belenky et al., 1997).
- Evidence of uptake patterns and adjustment to technology
- Signs of developing new knowledge eco-skills (Buchanan, et al., 2001)
- Signs of technology adoption and accommodation (Hall & Hord 2001)
- Effects on teaching and learning process and outcomes
- Attributed reports of effects on perceptions of self, others and community (e.g., Reid, 1998).
- Social emotional epistemological patterns re self and 'other' (Beatty, 2002).
- Signs of learning style implications
- Contributions to the philosophy of technological sciences

## Why WEBEX?

'WEBEX' is the corporate world's leading provider among a number of competitors whose internet based systems support synchronous multi-media communication using a suite of enriched interactive features. With telephone and internet browser, local and worldwide participants can application share, interact on a virtual white board, video stream from and to each other, text chat in real time, and audio connect. Such systems have inviting possibilities that conjure up dreams of connecting people, 'as if they were really there'.

## Findings

### The setup

For classroom applications, WEBEX itself is just the beginning. Ports are purchased in lots of 10, for a fixed period of time. Anyone in your organisation can be given access to the system for multiple uses. And the system is fairly easy to operate if you are working alone and trying to access only a few distant users. But there are unique challenges - pedagogically/andragogically and technologically - when one is trying to integrate the system's functionalities with the needs of a large class on campus and at the same time, trying to facilitate on campus learners to engage in interactive learning with a scattering of their widely dispersed peers. Training and human resources are needed. Thanks to the support of the WEBEX Asia Pacific team in Melbourne and the ITS team in Education and Monash Central, and the intrepid instructors and students in the course, the trials of WEBEX were made possible.

These trials have taught us that for these kinds of applications, fairly expensive additional equipment is needed to provide high fidelity sound both 'in' and 'out'. We have used hand held and lapel wireless microphones, sound mixers with and without professional operators, an independent PA system, and teleconference meeting equipment. For simple WEBEX meetings, i.e., one-to-one or one-to-a-few or a-few-to-a-few, standard requirements include telephone hook up or Voice over IP, possibly a simple teleconference voice amplification system, at least 56K but preferably broadband internet-connected computer technology and a browser. But in a classroom of 30 students, with 10 of their colleagues 'out there somewhere' one needs sound and video systems that can simulate a TV talk show set up with a digital projector, pre-start time uploaded applications for sharing, a video camera or two with operators, and a coordinator who can monitor all these inputs and mediate the remote inputs during the session, to ensure that the much sought after interaction actually occurs.

The WEBEX technology we found to be simple and reliable. The WEBEX technical support has been top notch and always available. What was complicated was our delivery structure. We were trying to link all members of a designated cohort who hailed from across Victoria. Their implicit job was to learn to learn together, to build a strong network of support that could sustain them in their coming years in school leadership. Our explicit mandate was to support them in so doing in whatever way it took! In each of the four units, all students attend beginning and ending intensives. The bread on the sandwich isn't the problem. It's the meat in the middle where it gets interesting. In intervening evening sessions, where typically a group of 30 or more drive-in students gather on-campus, there may be as many as 10 or 12 of their peers huddled over a computer in Mildura, Bendigo, Wodonga, or Lakes entrance for instance. One time we had someone join us on his holidays from Queensland. Another time a lecturer beamed in over a 56K dial up from Florida and handled the system brilliantly from her end. It was pretty amazing.

In a WEBEX session, as the convening moment approaches, distant participants connect via telephone using 1-800 numbers through Telstra conference call services. As the moderator welcomes them to the session with the system muted, they are gathering as in the green room of a

television studio. For the rest of us, except for the WEBEX logo and the 1-800 number and session code number projected onto the screen at the front of the room, all is business as usual. People are greeting each other and settling in for another 3 – 4 hour weekday evening MSL session. Once everyone is online, monitoring the real time chat, application sharing (such as power-point) and video selections that stream in and out can happen on campus or be operated by a remote participant. The idea is to ensure that these features enhance and not distract from the connectivity and learning.

Our early trials of our application of the WEBEX system emerged in the context of the Master in School Leadership. The course was committed to providing interactive learning among on campus and distant learners on behalf of nominated students who were scholarship supported by Victoria's Department of Education and Training.

The first night we used a typical teleconference system on a table and a wireless hand held mike with a lapel mike for the presenter. In seconds the system foundered and we had blown the hand held. For the rest of the evening we handed around the lapel mike, and did our best to wait until we had the mike before speaking. I (Beatty) was concerned that the distant learners seemed a bit tentative. On campus we were recording and transmitting video from two different sources. There were camera wires and tripods moving back and forth as we tried to capture the experience. All were patient and no doubt learning was challenged, but it was a bonding experience!

### **The initial three evening trials: what the students said**

In the context of the inaugural unit of Monash Education's new Master in School Leadership that had been tailor made to meet the needs of aspirant principals, nominated by their superordinates as likely candidates for future leadership, the course was designed to complement a visionary Victorian State school Blueprint for Education. Inherent in the blueprint strategies was the full scale embracement of the principles and practices of transformational leadership through the building of morally grounded relationally dynamic trusting learning communities,

#### **8<sup>th</sup> September 2004:**

I think that the setup for a first run was superb. I felt like we got almost as much from a distance as being there.

I was involved in the distance learning experience and found the technology of Webex brilliant.

It was so much better for me to be able to access this session in my workplace, and save the six hours of travel.

I found the distance learning experience an absolute life saver!!! Thank-you so much for making this all possible. Of course there were a few difficulties with audio, but I am prepared to live with all of that. Without this facility I could not manage the program.

We then went to a separate PA system and three hand held mikes. The battery in one died, but the other two hung in, and we got through our second evening with a measure of greater success. We added video elements with webcams streaming in and our faculty digital video camera providing the view of us from a distance. Distant learners participated, and could hear all we said and we were getting better at waiting to speak until we had a mike in our hands. This in itself was a breakthrough.

#### **29<sup>th</sup> September 2004**

The video visual was an excellent addition. I am looking forward to having the video as a distance learner next time.

Webex adds another dimension to our learning.

I thought the Webex experience was highly successful and really helped to make the distance learners very much a part of the experience.

I think the technology experience has been excellent.

I particularly enjoyed the increased level of interaction of the distance learners at this second workshop.

The distance learning interaction is evolving beautifully – superb organisation, which is so often missing in education!

In the third evening trial, we hired a sound technician, who brought an independent PA system and a mixer, to monitor voice in and out. By the end of the evening we felt that the feedback should indicate some improvement with the sound, and by now we were integrating webcam and 'video in' from campus, with streamed pre-recorded video and a variety of other inputs. Student groups were making presentations on educational philosophers – costumes and all, and the going was pretty exciting, with some groups split between here and there. We were keen to see the reviews.

### **13<sup>th</sup> October 2004**

I found the technology this time round spot on, from a distance perspective. The combination of the variety of forms of technology all worked exceptionally well.

The quality of the link up was sensational.

It is a 'claytons' classroom experience, as close as it can be to being there without actually being there!!

The technology has improved enormously, and I feel very much a part of it lately. I now realise that it would be impossible for me to study if I had to attend a three hour lecture at Monash, 3 hours away, regularly.

Thanks .. I really appreciate the trailblazing!

I think you lifted the bar once again by introducing the video linkages. The quality was sufficient and I felt more connected than ever.

I believe you have just about nailed it! Well done.

We were strongly encouraged by this feedback, and so it seemed that it was worth having a go at finding some funding for continued trialling of the system. Eventually, a Deputy Vice Chancellor's teaching innovation grant funding scheme came through, and we were back into the WEBEX trials, this time for a full school year. It was January, 2005 and the WEBEX project had begun.

### **The initial trials from the instructor's perspective**

Early trials included guest lecturers who had no particular connection with the course or its technological innovations, other than their exposure to it in the context of their presentations. Thus we include their comments as some indication of the way WEBEX supported learning may seem to a relatively objective 'outsider', who has a first time experience with WEBEX.

I was especially impressed by the use of Web-Ex that allowed for communication and intellectual engagement with students who were located off-campus. This mode was effective and I hope that this mode will continue to be used in this program - as well as in other programs (Instructor A).

I was highly impressed with the strong sense of collaboration, preparation and engagement with the material that emerged in the work presented to the larger group. This was particularly impressive given the dispersed locations of the participants and their professional workloads within schools. The session also reached dispersed learners via Webex and I was enthusiastic about the

possibilities for robust learning in both distance and face to face mode (Instructor B).

The following account may help to characterise some of the configurations and applications we have thus far trialled using WEBEX. – (Beatty, B.)

Students in unit two are required to design and create their own websites in support of their action research projects. On two critical evenings, the WEBEX system made it possible to have computer lab workshops before and after the regularly scheduled sessions, to help students learn together as they were being guided by their colleagues who had taken roles as the designated 'website support team' on the project. These occasions, made available to on and on-campus learners, functioned to help all students take heart that they weren't alone with their digital struggles and to get the timely assistance they needed. WEBEX was a lifesaver. And the student presenters had no difficulty adapting to the system. Despite the apparent chaos, the multi-tasking student guides and the cooperation among the students here and there allowed the learning to come together in a very short time. During the formal lecture part of those evening sessions we were covering Maths and Science Success, and Languages and Literacies respectively. There were multiple presenters each night. Breakout groups continued to figure prominently in the lecture/workshop delivery style and the WEBEX distance gang seemed to be working fluidly together, and more confidently chiming to the larger group. On the Languages and Literacies evening there were four short presentations first, with questions floated, and answers held for later. Then we took the WEBEX group and on-campus group (split into two) through a carousel of 3 X 30 minute segments covering three topic areas in more detail and depth. The exclusive access to the instructors among these smaller groups made this configuration a real hit, especially with the off campus group. This was reputedly the most effective combined on and off campus configuration we had used to that date. A third evening session that semester involved convening all of us, including the two lecturers in off-campus WEBEX mode. Participants used webcams if they had them, and we instructors had our web cams and power points and the WEBEX whiteboard and other tools, as we worked through the night's lecture material together. This became the favourite arrangement. No doubt the convenience of staying at home was part of the appeal, but there was also the easy access to the two instructors, that seemed to flow naturally, among this well oiled group of adult learners.

In preparation for this paper, the co-authors discussed with three students various aspects of their WEBEX experiences. We were seeking to establish some emerging patterns in their responses that we should follow up in further study. One student was a full time WEBEX session distance learner. A second had done both - on and off campus WEBEX assisted evening sessions and a third had been an exclusively on-campus learner on those occasions. We considered WEBEX advantages, challenges, limitations, future possibilities, learning and teaching. Several of the key ideas that emerged crossed over into our preset themes. Others were new. What follows is a summary of some of the themes from that discussion.

Looking back to the early days of WEBEX use, distant students recalled that the first session from a distance had been 'difficult' and 'frustrating' and for the on-campus attendee that evening 'distracting', but this was superseded in time by a growing confidence and degree of comfort in accommodating to the new environment.

Yet, from a relatively disruptive novelty, the WEBEX environment quickly became in the word of one interviewee '...just part of what we do, it's become part of the culture of the course and ... part of what we do ...'. Here it would appear that some form of collective or social learning is occurring in the adjustments that participants are making to the context as they become habituated to the WEBEX system.

Participant reports indicated that media richness (Huber, 1991, p. 103) in the sense of mixed forms of representation (Boland et al., 1994, p. 471) was an important feature of the WEBEX environment. The importance of video was noted. One interviewee commented '... I mostly flick to the video when somebody new is speaking ... just to get a visual ... rather than have to just remember their name.

If I can remember their face, and I can relate'. Another interviewee remarked on the perceived importance of the video by saying '... well you've gotta see the people – that visual connection I suppose – it's good to hear ... but I like to see the person I'm speaking to ...'. Interestingly, the media richness of the technology prompted this observation from an interviewee about learning styles 'I suppose this goes to different sorts of learning as well, but ... being able to view a little bit of video, or listen or read all at the same time really takes care of a lot of people's learning styles, and it's a good blend'.

Interviewees saw the whiteboard feature of the WEBEX technology as being important, particularly as an interactive component, and as a central point or convergence zone for attention. One commentator notes, 'one thing that is very important is the whiteboard ... that is very important for the interactive ... the other day we did a piece of work together with everybody online, putting down their thoughts on that whiteboard, and that was very effective .... The whiteboard lets multiple people join in quickly'. The capacity of the white board to be instantly converted to a space for sharing a wide variety of software applications, such as PowerPoint, was also seen to enhance its power as a representational medium where attention could coalesce. One interviewee who was a remote off-campus participant in a WEBEX session commented on '... the power of seeing the PowerPoints .... I think you actually feel as if you are sharing in what people are seeing down there at Clayton ... I can see exactly what they can see, so you do feel that there is no disadvantage'.

The WEBEX experience at a phenomenological level appears to create a sense of situated proximity, or contraction of the real distance and separation in space and location. While watching the video during a tea break one interviewee commented on how '... it almost felt like I was having the break there.' Another student interviewee commented on the sense of proximity created by the whiteboard 'there was an activity going on at the university ... and having that whiteboard let us do that virtually ... in the end it did feel like we were actually sitting there all together ... that whiteboard is very powerful.' For an on-campus WEBEX participant located in the classroom, the technology appears to facilitate an awareness of remote learners at a distance, and in doing so, creates the sense of their colleagues' presence: '... it's just like they're in the room .... You know being there in the room – it's just like they're ... right there.

Emerging clearly is confirmation that the key to student centred interactive learning is that you just have to be there - one way or the other.

The WEBEX lets the personalities come through, like when it's face to face the whole day and we see everybody, the way the room, the dynamic of the room or the way the room works, is fantastic. I love it. . .

So the advantages of WEBEX would be that you could actually join in on that conversation and experience it first hand. . . . when you miss a class, even though people are really generous and want to be able to fill you in . . . with the face to face sessions, they're often not just something you can sit and take notes and pass on. . . You really have to be there either remotely or face to face. . . . [With WEBEX] it's ... just like they're not even not there.'

WEBEX's power to assist in maintaining the social, emotional and intellectual connectedness among all members of a large learning group is a significant finding from this initial stage of our inquiry, one that we intend to pursue. The ability to provide the continuity of connection apparently enhances the group and individuals' sense of the whole, and individuals' confidence for learning with each other and genuinely inquiring, challenging and asking for help when they need it. If WEBEX can assist in avoiding the typical disconnection and alienation that distant learners often feel and at the same time, promote the creation of sub-groups of study buddies, who cooperatively multi-task, discussing content, unpacking questions and staying tuned to the progression of the session at the same time - as indications from these students have suggested - then it holds promise for making distance learning potentially preferable to literally being there. On campus, the norms of classroom behaviour impede self-directedly and collaboratively arriving at learning choices and communication modalities. Off campus no such constraints exist – even in real time delivery. Signs that the WEBEX group have become comfortable with the medium for their purposes, and

that the on campus group are becoming comfortable with their virtual presence suggest WEBEX may be good for all.

These and other similar comments suggest to us that a kind of embodied experience of the virtual situated reality seems to occur in these 'combination on and off campus' sessions. WEBEX assisted learning configurations seem to allow distant participants and on-campus student alike to feel like they are all in the same space together. Another student who experienced WEBEX at a distance for the first time, commented that it was a kind of 'out of body' experience. Imagine, an educational teaching tool that assists learning by transcending barriers of time and space. The possibilities are quite alluring.

## Summary of highlights in these and other findings

- The provision of continuous high quality audio is critical to this kind of real time connectivity in order to optimise engagement for both on campus and distance learners.
- The investment in auto-sensing video/audio system would save a lot of energy and simplify the system's setup, thereby enhancing the likelihood of uptake by new users
- Uptake patterns among academics outside of this program suggest that the likelihood of adoption of WEBEX, as a teaching aid, like any new technology, is anything but a given. Experience and support in adapting to the technological possibilities are key.
- Learning style considerations have emerged as worth exploring to discover how the WEBEX system's wide variety of tools and modalities may broaden and extend access to new learning. This theoretical strand will be pursued in our further study.
- From an epistemological development perspective, shifts from evidence of external knowledge authority dependence in the initial stages, to internal knowledge authority have been notable among these learners (see Perry, 1970) x We attribute this effect to a variety of factors, including their peer and connected collaborative learning (Belenky et al. 1986; 1997) in the online forums as well as WEBEX, along with the content, style of delivery of the unit's material, and the students themselves, and their readiness to learn.
- With WEBEX – 'being there' at a distance is apparently quite achievable.

## Conclusion

Even with the technological challenges, and complexities, the feedback from the students and instructors is powerfully suggestive that WEBEX is well worth the effort. The financial impact of the system depends on how you use it and the contractual arrangements you make with the company. We have had a co-researching relationship with WEBEX in this trial. At full retail price, the uptake and associated income from additional market access would have to carry the load of the outlay. As we perfect the system's use however, and become more comfortable and familiar and habituated to including it in our teaching and learning plans and preparations, we can imagine a time when a system like WEBEX may in time, become just another familiar tool in the tertiary education kit. In the meantime, our experiment continues.

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