Synchronous virtual supervision of professional experience

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Synchronous virtual supervision of professional experience: Issues and challenges

Abstract

The supervision of professional experience undertaken by tertiary students is an important component of any university programme. In Australia and other countries where there are vast distances between the university and the setting in which professional experience takes place, direct supervision by university academic staff is problematic. Alternate arrangements are sometimes put in place such as telephone links, emails, and on-line discussion boards. This paper explores the feasibility of synchronous virtual supervision in Australia with a view to develop positive reflective practice in pre-service teachers. This paper highlights the technical, ethical and logistical difficulties in using synchronous virtual supervision of teacher education students and points out the potential of this technology to overcome some long-standing problems associated with distances between universities and regional, rural, and remote schools. While this paper focuses on teacher education the same principles can be applied to other professions where there is a professional field experience.

Introduction
The use of video conferencing has changed over the past ten years from a board room "talking head" scenario to virtually anyone with access to a computer who can utilize video conferencing that can share desktop images, utilize and exchange files and data. The availability of faster broadband speeds with greater upload speeds, the use and accessibility of wireless technology means the capacity to have audio, visual and text simultaneous is more a reality at the end of the first decade of the twenty-first century than it has ever been.

Synchronous video conferencing has been utilized for a number of activities including telemedicine (Olver & Selva-Nayagam, 2000), telehealth (Olver, Shepherd & Selva-Nayagam, 2007), teleradiology (Collie, Kreshka, Ferrier et al., 2007) , telepsychiatry (Rohland, Saleh, Rohrer & Romitti 2000), and telepathology and telematopathology (Leinweber, Massone, Kodama et al., 2006). The emphasis in this paper is on using the technology to supervise professional experience and specifically in teacher education to enhance the quality of the teacher education graduate.

Literature review
There have been long-standing issues raised by researchers over the divide between theory and practice in teacher education (Grenfell, 1999, Sachs, 2000). On the practice side, the increasing demand for improved quality assurance in professional experience calls for alternative ways of supervising pre-service teacher educators. Yarrow, Millwater & Albert (2001) highlighted the use of information and communication technologies to enhance the teaching and learning process but little progress appears to have been made in utilizing this technology in the latter part of the twentieth century and early twenty-first century.

There may be some merit in the notion that the relationship between pre-service teachers and university supervisors is one of engaging in critical reflection (Siens & Ebmeier, 1996) although such a view may reinforce the perception that university supervisors are "out of touch" (Leiminer & Mayer, 2001) with classroom situations. The value of reflective practice has gained more prominence especially in metaphor analysis, exploration of narrative, and action research where critical reflection has become part of the professional experience to positively reinforce the experience (Leiminer & Mayer, 2001). The nature of professional experience is still problematic particularly when there is variable engagement by university supervisors.

A hierarchy of reflection has been presented more than thirty years ago by van Manen (1977) which is still applicable today and this hierarchy is made up of a first level of technical reflection which requires considering the best way to achieve a goal that had not been previously defined. The second level consists of practical reflection, where the teacher "examines the means and goals, and recognises that the meanings are not absolute, but are embedded in and negotiated through language"(Admiraal, Veen, Korthagen, Lockhurst, Wubbels, Herandez, Fonollosa, Grisos, McShea, Bennett, Davis, Jennings, Gudmundsdottir, & Hoel, 1999, p72). The third level is one of critical reflection (Admiraal et al, 1999). The results of the Admiraal, Lockhorst, Wubbels, Korthagen & Veen (1998) study highlighted that the use of assistive technology in professional experience was an incentive to be reflective and video conferencing gave the capacity to provide immediate feedback whereas asynchronous email, chat rooms, blogs provide the opportunity to reflect before typing and providing a response. In attempting to enhance quality of teacher training the use of synchronus feedback is instant and enables the student to reflect

on how to respond to the feedback provided.

There is also some merit in university supervisors visiting and observing pre-service teachers in action in the classroom but it is open for debate whether constructive supervisory feedback and reflective practice does indeed provide positive development. It is also debatable whether egalitarian supervisor-student relationships are useful as such approaches are sometimes viewed as lacking rigour particularly as the research indicates that novice teachers do not have enough self-confidence and experience and require support (Hart, 1994). The use of assistive technology has been trialed particularly with asynchronous discussion boards (Doering, Johnson & Dexter, 2003). However this use of assistive technology is post-event rather than while the event is happening. There is a real need to provide, as occurs in the training of counsellors, direct feedback to students immediately after the event or where applicable while the event is occurring (Capner, 2000; Rees & Gillam, 2001).

The current situation in many faculties of education in Australian universities can be characterized by the inability to adequately supervise pre-service teachers during their professional experience. At best, there is a visit from a university academic staff member to observe professional experience, and at worst there is no visit at all. There are a number of reasons for this deficiency not the least being the dispersed nature of professional experiences that occur in regional, rural and remote locations sometimes vast distances from the university. The distances needed to be traveled mean that in many cases only telephone calls to the pre-service teacher, teacher mentor and school principal take place. In addition, there is a lack of suitably qualified and experienced teacher mentors in schools and universities.

The limited capacity to observe the pre-service teacher and the over-reliance on the school based teacher mentors can lead to less than optimal outcomes. One way to overcome the tyranny of distance is to use video conferencing and, more specifically, synchronous video conferencing of the pre-service educator whilst he/she is teaching in a class. Technically in Australia, such an approach is feasible in many state schools in New South Wales. The initial use of video conferencing in schools within New South Wales occurred in 1998 with the use of ISDN as part of the Riverina Access Program (New South Wales [NSW] Department of Education and Training [DET], 2008). The Riverina is located in south-west New South Wales approximately 500 kilometres from Sydney. This program linked three small schools - Ardlethan, Ariah Park and Barellan Central - to deliver year 11 and 12 programs. In 2003 the NSW DET implemented the Polycom Internet Protocol (IP) video conference system with 50 cameras put into service across the state and connected to Path Navigator and Global Management servers and MGC 100 chassis/hub located in Sydney (NSW DET, 2008). By 2007 there were 430 schools involved using video conferencing for remotely delivered lessons, teacher-in-service training and administrative meetings.

There are a number of configurations of video conferencing equipment have occurred in NSW schools. These configurations include the following a dedicated room set aside in the school administration block for video conference cameras to be used mainly for meetings. Other examples include the use of a computer room to set up the video conference equipment and typically place it in a locked cupboard with limited use or access. A more recent set-up has been a dedicated teaching classroom where two ceiling mounted cameras have been installed and this typically occurs in a secondary setting where the daily operational procedure has been

where students move from class to class. The idea of a portable camera which is plugged into a LAN (Local Area Network) and used in any classroom has not been considered.

What has occurred in New South Wales schools is by no means unique worldwide as the development and use of video conference facilities in schools has grown in Europe and North America. One example of this has been the Genesee Network for Education Telecommunications *(*GenNet) Program in Genesee County Michigan using video conference facilities to deliver a range of subjects that individual schools would not normally be able to provide including teaching American Sign Language (Genesee Intermediate School District, 2008).

Very little exists in the literature about the use of synchronous video conferencing for supervising pre-service teachers while undertaking professional experience. However, the work undertaken by Garrett & Dudt (1998) in the United States recognized that video conferencing is an effective tool for the supervision of pre-service teacher educators and it can reduce supervision costs. However, they also found that the cost of Integrated Services Digital Network (ISDN) lines as well as ISDN accessibility was prohibitive. However, the lack of compatibility between different manufacturer's CODEC units (a CODEC digitalises and compresses video and audio signals for transmission) that was prevalent in 1997 no longer exists and the use of video over internet rather than ISDN has significantly reduced costs. In reference to Broadband access, the initiatives undertaken by the New South Wales Department of Education and Training "Connect-a-Classroom" has ensured that this access is available to most schools. Thus, in Australia, some of the technical and economic difficulties reported by Garret and Dudt (1998) no longer exist.

One of the most comprehensive literature reviews about video conferencing has been undertaken by the British Educational Communications and Technology Agency (Becta) (2003). The review found that pre-service teachers can observe teaching without having to be present in the classroom and reported that the work by Sharpe, Hu, Crawford, Gopinathan, Moo, and Wong (2000) and Kinnear et al (2002) highlighted positive aspects. One of the positive attributes of video conferencing reported by Sharpe et al (2000) was that students on teaching practice can feel safety in distance when using video conferencing to communicate to their university supervisors. However, Australian research indicated that professional experience may not be highly valued by pre-service teachers due to a number of underlying factors not the least being the lack of connection between theory and practice and the lack of involvement of university staff in actual supervision of pre-service teachers (Leiminer & Mayer, 2001).

Kinnear, McWilliams & Caul (2002) reported on the use of video conferencing in a teaching and learning environment in a primary school and a teacher training college in Northern Ireland. In their study, the pre-service teachers were observing rather than being observed. Kinnear et al (2002) suggest that the students benefited pedagogically from the use of video conferencing although there were technical difficulties encountered with camera control. Interviews with the students suggest that it was appositive experience and the technology had great potential. Dyke, Harding & Liddon (2008) conducted a study of 25 lessons observed in real time with synchronous video conferencing and found that digital observation was a viable alternative to face-to-face observation for assessment and feedback on teaching performance. Little research data is available concerning synchronous supervision of actual lessons being taught by pre-service teachers and observed remotely by university supervisors.

Admiraal et al (1998) examined the use of computer video conferencing with pre-service teacher educators and their supervisors in four teacher education programs. The researchers evaluated the participants' opinions of computer conferencing and their participation, activities and educational outcomes and found that rather than utilizing the technology for reflecting on teaching practice and ideas exchange, the technology was used for exchange of emotional support via the use of chat rooms" or discussion boards.

In another study of synchronous video conferencing Amodeo & Taylor (2004) used the Internet Protocol (IP) based video conferencing equipment (VoIP), to study if such a procedure can enhance supervision of staff and students in school environments. Their study found that synchronous video conferencing did enhance the professional experience.

Although there have been many applications of the use of video conferencing to assist in the delivery of health services however, none of these use synchronous video conferencing for the supervision of professional experience.

Internet Protocol or ISDN
Within Australia two choices exist that can provide video conferencing to rural and remote areas from a regional or capital city: ISDN and Video over Internet Protocol. The limiting factor for ISDN is the cost and accessibility in rural and remote centres whereas Video over Internet Protocol (VoIP) has major limiting factors in upload speed and bandwidth. For VoIP to work effectively with minimal packet loss there is a need for an adequate broadband speed. Within Australia, 'high speed' Broadband is about 384kbps for most domestic users which is considerably slower than that of the United Kingdom [3.6 megabits per second] (Ofcom, 2009) and South Korea [100Mbps] (Gigaom, 2009). While the use of Broadband in Australia is increasing with the latest uptake being about 46% of dwellings in major cities and 24% in very remote Australia (Australian Bureau of Statistics, 2007a) Inner Regional, Outer Regional and Remote Australia Broadband access is currently at 32%, 27% and 28%, respectively (Australian Bureau of Statistics, 2007b). The uptake of Broadband Internet access varies across states and territories of Australia with regional and remote areas less likely to have Broadband access.

Quality standards in professions
Within Australia and other OECD nations quality frameworks have been established by government organizations such as the National Health Service (NHS) in the United Kingdom (Marrow, Hollyoake, Hamer, Kenrick, 2002), and educational professional bodies (New South Wales Institute of Teachers, 2008) to improve and maintain standards in training and professional experience. Institutions such as universities which have large enrolments in professional degrees (e.g. nursing and education) that require a professional experience have difficulty ensuring the quality of professional experience as well as utilizing critical reflective practice as a theoretical framework to enhance the quality of the pre-service student.

Limited or no supervision except by field mentors can lead to discontinuity between theory and practice as well as devaluing the expertise of university academic staff (Leiminer & Mayer, 2001). Being able to bridge the gap of physical distance, observing professional practice and reflecting on this practice is seen as a positive way to enhance the individual's practice (Siens & Ebmeier, 1996; van Manen, 1977).

Within the university sector there are a number of professional pre-service degrees that have professional experience as one of their components. These include degrees in nursing, education, pharmacy, occupational therapy, physiotherapy, engineering, and law.
In Australia all universities except for one has an education degree program. The number of teacher education students in Australian universities in 2005 was 63,194 of which 16,250 graduated (Stokes, 2006). Finding suitable placements for these students in school settings is a considerable challenge especially when combined with an attempt to ensure some degree of quality assurance of performance by the teacher education students when on a professional experience placement. The capacity of universities to allocate suitably qualified academic staff to supervise professional experience is severely limited. Reliance on teachers in the field to supervise adequately or to an appropriate level is compromised by lack of quality assurance.

Supervising professional experience of pre-service teacher education students
In Australia regional and metropolitan universities have difficulty making visits to schools where pre-service teachers are undertaking professional experience. Some states in countries with a vast geographical area and sparse population usually restrict where students may go in their professional experience so that they can provide adequate supervision and appropriate placement. In Australia students may enroll at a university that is in a different state and undertake a professional experience that is 100s sometimes 1,000s of kilometers away from the university.

Some regional universities in Australia (Charles Sturt University and Central Queensland University) undertake supervision of teacher education professional experience via telephone and email contact with the deputy principal of the school and the teacher mentor, and by and tele-conferences with deputy principal, teacher mentor, pre-service teacher and university supervisor. Where there are issues to resolve an academic staff member will be sent. Some regional universities employ supervisors from other universities to visit pre-service teachers on professional experience. For all universities, quality assurance is an issue with a heavy reliance on the professional judgment of teacher mentors.

Practices that could be utilized to ensure appropriate quality assurance include mentoring professionals in the field, having a sessional university staff member whose role is to visit multiple locations within a district or region, or allocating a dedicated number of positions within a university department, school or faculty to undertake supervision. All the aforementioned practices have their limitations such as finding suitably experienced supervisors, suitably experienced teachers, availability of supervising teachers to discuss and debrief, and strengths such as local knowledge, operational teachers, experienced teachers. With the increasing accessibility to computer technology with high speed data transfers, the use of video conferencing has the potential to be very effective in professional supervision. The limitations of this technology are the data access and the initial cost of the video conference equipment.

Advantages of synchronous supervision of professional experience
There are a number of advantages of synchronous supervision using real time video conferencing with VoIP. First and foremost it provides the capacity to supervise tertiary students in real time. The performance of a student can be observed by university supervisors from a distant location. Furthermore, one or more university supervisor/s can observe and debrief several tertiary students within one day as well as debrief and discuss with the teacher mentor

and this can be useful in the critical reflection of performance undertaken by pre-service teachers.

A second advantage is an objective assessment of the tertiary student's performance without relying on notes or a recorded video of the activity after the professional experience. The presence of an observer in the classroom or work place can compromise the performance of the tertiary student and be a distraction for others, particularly young children, in a teaching and learning environment.

A third advantage is the capacity to record and archive the event for debriefing sessions with the pre-service teacher and the field based teacher mentor. The capacity to pan and zoom gives the university supervisor the capacity to observe all those present in the teaching and learning environment.

A fourth advantage for universities is the capacity to minimize risk for academic staff that may have to drive or fly long distances to observe a university student in a field setting. In a remote and rural location a university supervisor may have to travel up to 400 kilometres to observe the student teach.

A final advantage is the economy of scale. As new statutory requirements become part of pre-service teacher education, specifically 120 days professional experience during 4 years of study, universities will be stretched even further in their ability to adequately supervise pre-service teachers. The task of supervising pre-service teacher educators becomes even more demanding when universities have limited funding to send academic staff to supervise students with the compounding factor that these staff become unavailable for their other regular commitments at the university. Amodeo & Taylor (2004) claim that synchronous virtual supervision can provide a viable alternative for addressing issues that often compromise effective supervision particularly when it comes to professional experience for pre-service teachers.

Limitations of synchronous supervision of professional experience
There are limitations to synchronous supervision of professional experience which mainly have to do with network issues. The first issue is the need to sort out network protocols and procedures of the specific educational authority. In a classroom, there has to be activated a specific data point capable of transmitting and receiving video and audio data, to and from the server of the educational authority. The end-point, in this case the university, needs to be registered to the server to enable data access. The server needs to be able to recognize the Internet Protocol (IP) address and allow the connection. There are also issues in relation to security and the capacity of the far-end (university) to dial into the classroom (near-end) or vice-versa. Either way, the bridge which connects the two points needs to recognize the IP address.

A second issue is the connectivity of specific classrooms using a camera. Although, theoretically, classrooms in New South Wales government schools may have connectivity via Smartboards©, the capacity to be able to connect a video conference camera into each classroom on the school site would need to be tested on a room by room and site by site basis.

A third issue is the control of the camera in the classroom from the far end (university). Although, theoretically possible, the likelihood of remote camera control is limited due to the access going through two networks: that of the NSW Department of Education and Training and

the university network.

A fourth issue relates to microphone use and operability to ensure a clear audio signal. A wireless microphone that could be worn by the pre-service teacher educator would be ideal but the system that can utilize wireless connection for microphones is not acceptable to the Education Department's network. Technically, this is feasible but is limited by specific protocols set up by the New South Wales Education Department.

Discussion

The pre-service teacher educators bring their own school experience to their training which, in turn, informs them about schools, school structures, curriculum and teaching methodology (Britzman, 2000). Leiminer & Mayer (2001) report that the prior conceptions that pre-service teacher educators have are relatively inflexible and resistant to change, and that teacher education programs have little impact on the attitude of the pre-service teacher educator. There may be a degree of accuracy in this claim particularly if teacher education programs do not bridge the nexus between theory and practice. Relying only on the professional experience as the medium through which the connection between theory and practice is made would no doubt reinforce the preconceived notions of the pre-service teacher educator.

The professional experience purports to focus on learning about teaching while at the same time requires the student to be a teacher. In many university courses the practicum is structured as a graded assessment. For pre-service educators this process can be stressful, demanding of them to learn about teaching while being assessed on their performance by the teacher mentor and the university (Leiminer & Mayer, 2001).

At times the pre-service teacher educator's notion of what teaching is can be challenged. Although the use of reflective practice and critical reflection has gained more prominence, (Leiminer & Mayer, 2001) the nature of professional experience is still problematic particularly when there is variable engagement by university supervisors.

The use of synchronous video conferencing of lessons taught by pre-service teacher educators in real classroom situations which are observed by a university supervisor could also help dispel the perception of university supervisors as being "out of touch" and "who has to be endured and placated during his or her infrequent and hurried visits to the practicum school" (Leiminer & Mayer, 2001, p 1). Being able to record, critically analyse and reflect on these sessions immediately after they have occurred may have a positive impact on teacher education professional experience. Synchronous video conferencing has a potential to change some problematic current practices such as limited or non-existent university supervision, minimal telephone contact, and feedback provided long after the professional experience had taken place.

Various approaches have been attempted to bridge the gap between the experience of the pre-service teacher and the university supervisor by utilizing the virtual learning environment. Examples of these include the use of on-line discussion boards, synchronous virtual tutorial groups, and on-line "key board stroke" tutorial groups that are basically text centered, by the pre-service teacher utilizing the WebCT or Blackboard platform. While such initiatives are valuable their limitation is that the classroom experience cannot be directly observed.

Leiminer & Mayer (2001) summarize the difficulties with professional experience visits by stating that the actual visits by university supervising staff is limited only to one visit and that the major preoccupation of the pre-service teacher is to survive and pass the practicum experience. Our current study attempts to overcome these difficulties by developing a virtual interface between the pre-service teacher in the classroom and the university supervisor and teacher mentor. The nature of professional experience needs to change from one in which the pre-service educator just wants to pass the professional experience to one in which this experience is supported and enhanced by constructive assessment by university supervisors and the teacher mentor. Technology which enables virtual supervision of the professional experience has the potential to bring about this change.

Conclusion

There is a need to undertake research in the use of synchronous video conferencing for professional experience supervision and unlike other studies (for example, Kinnear, Williams & Caul, 2002, Passmore & Melville, 2007) actual lessons need to be observed in a classroom that will be viewed by the university supervisor at the time of delivery with debriefing taking place immediately after the lesson is taught. In previous studies researchers have had pre-service teachers deliver lessons remotely, or video-taped lessons which were viewed after the professional experience took place sometimes few days or weeks later.

There is a perceived lack of structure of professional experience particularly in teacher education with a discrepancy between what pre-service teachers are taught at the university and what they are expected to teach in schools, and lack of formal preparation of university supervisors (Passmore & Melville, 2007).

The use of synchronous video conferencing does not attempt to bridge the nexus between what pre-service teachers are taught in the tertiary sector and what they are expected to teach in schools but rather its use could be a constructive way of informing the university supervisors and enabling pre-service teachers to engage in critical reflection of immediate past lessons taught knowing it has been viewed by a university supervisor.

The potential for enhancing the professional experience by means of this technology is enormous, particularly given the number of professional experience days required for teacher educators, nursing, social work, the remoteness of some schools, clinics and agencies in Australia, and shortages of qualified academic staff to supervise pre-service teachers, nurses, social workers in the classrooms, hospitals, clinics and agencies. Some of the benefits of using synchronous video conferencing have already been noted (Brand, 2004) for teaching instrument classes and masterclasses. Synchronous video conferencing is used as an effective means of engaging with students in rural and remote parts of Australia (Lancaster, 2007). The use of video over Internet protocol is an economical means of delivery and far more sustainable than the use of IDSN. Apart from the technology here is also the need to train academic staff in how to work in this medium. According to Callinan (2000),"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 access"(p. 154). As the use of video conferencing becomes more accessible there will no doubt need to be the need to train teachers in how to enagage students in a virtual visual/auditory medium.

There is a need to undertake further research to test the possibilities, limitations and strengths of such an approach as part of enhancing the quality of professional university graduates.

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