

The sound and the vision: developments in interactive distance education facilitated by satellite broadcast in NSW and the NT.

**Lorraine Towers, University of Newcastle
Amy Hutchinson, Charles Darwin University**

Abstract

How has the new interactive distance education system facilitated by satellite technology been utilised and incorporated by teachers and learners? Has it changed the ways teachers deliver education to remote students? What have been the implications for the curriculum delivered via distance education? How has it affected the ways learners interact and build relationships with their peers? These questions are the focus of this paper and accompanying presentation, and form part of the broader focus of the Australian Research Council Linkage (ARCL) project on Interactive Distance Learning (IDL)¹, “Opening Our Eyes”.

The authors are part of the project research team which has been conducting fieldwork by observations and analyses of real-time lessons and interviews with teachers, parents, home tutors and students. In this paper, we focus on teacher practice, providing specific examples from the field to illustrate the many and varied ways in which the technology is being used. The intention is not to provide conclusive assessments but, hopefully, to provide the basis for collegial sharing and constructive discussion.

Introduction

Since 2003 there has been a remarkable change in the delivery of distance education. Satellite broadcasting has dramatically opened up the technical possibilities for interactive teaching and learning, and transformed the possibilities for social connectedness. For the previous fifty years, it was only possible to broadcast sound to students in rural and remote areas through the now superseded system of VHF radio, used by the iconic ‘Schools of the Air’ (Crump, Tuovinen and Simons 2005). The satellite system was initiated to provide a far more reliable and dynamic modality for teaching and learning, which could provide remote and isolated students with equitable educational opportunities (Boylan, Wallace and Richmond 2000).

The most significantly obvious feature of this new system is the addition of vision to the sound, providing for real time, live audiovisual broadcast of school lessons. Distance education students can now see as well as hear their teachers; in some cases in the NT teachers can also see their students. This is a remarkable change in itself, which vastly increases the possibilities for interactivity. However, this is only the beginning, as computer based programs have further expanded the possibilities for interactivity through a virtual shared space and an increasing array of tools and applications. Asynchronous communication tools, which can be used in and out of lesson time, have further extended the realm of interactive possibilities.

How has this new system been utilised and incorporated by teachers and learners in practice? Has it changed how teachers formulate and deliver their lessons? How are teachers using the features of the system to achieve the learning objectives or, indeed, to

¹ For the sake of simplicity IDL, the term commonly used in the NT, is used in this paper, although in NSW the terms Interactive Distance e-Learning (IDeL), or ‘satellite education’, are most frequently used.

push the boundaries of possibility? Has it changed the way that students learn and interact with each other? What has been the impact on skills development and curriculum? Are new kinds of learning relationships and understandings of community developing?

These are some of the questions being raised by the ARC Linkage project “Opening our Eyes” on Interactive Distance Learning (IDL), conducted via satellite in NSW and the NT, and the focus of this paper. The authors are part of a team² which is conducting fieldwork by observation of lesson broadcasts and remote reception, and in interview with teachers, learners, parents and home tutors to investigate the impact of satellite broadcasting. The theoretical framework of the wider project draws on Engeström’s Activity Theory (Devlin 2008).

Scope and limitations : issues of comparison

The ARC Linkage study focuses on IDL via satellite in primary education and post-secondary technical education, however, the focus in this paper will be mainly on the former as most of the data collection by the authors, to date, has been in this sector. It is not possible at this stage of the research to draw **definitive** conclusions on student engagement with the technology or to provide direct and specific evidence for academic outcomes. The subject here, therefore, is teaching practice, rather than a definitive assessment of actual learning. It has not been a concern of the study to judge or assess teachers but to develop an understanding of the many different ways in which the new technology is being utilised. The paper is descriptive and exploratory rather than conclusive, seeking to identify how this new system is being utilised and extended, with the aim of providing feedback on current practice for further constructive consideration and discussion.

The study has not been framed to make a specific and formally structured comparison of IDL with mainstream (face to face) schooling. However, many of the participants in the study have offered comparison on the basis of their experience. Inevitably, there are some differences in the way that various schools use the system but, again, the study does not explicitly make a comparative assessment of these. There have also been many points of comparison made between IDL and radio by those who have experience of both systems, including primary students currently within the system.

Contextualising the system: differences, similarities and continuities

Different software systems are used for the delivery of satellite education. ONE TOUCH™ is the universal operating software for satellite delivery in NSW. It derives originally from a video conferencing program and currently permits one way vision from the broadcast studio in real time, with accompanying synchronous sound. A variety of interactive tools are used during the class and, in the case of chat, email, internet, can also be used outside of class time. REACT™ is the chosen remote education conferencing software for the provision of IDL lessons in the NT. It also offers a variety of interactive teaching tools and one way vision from the broadcast point, although a trial of two way vision is currently underway at some sites.

REACT™ differs from ONE TOUCH™ in that it was specifically designed for teaching via satellite by Michael Wilson, who has continued to develop the features of the software (now in its fourth version) in response to teacher and student feedback on their specific

² Stephen Crump (University of Newcastle), Brian Devlin (Charles Darwin University), Kylie Twyford (University of Newcastle), and Alan Anderson (University of Newcastle) are fellow members of the research team who must be acknowledged for their valuable contribution to the fieldwork on which this paper is based.

needs. REACT™ has been engineered to operate on minimal bandwidth. This allows for greater flexibility in site location for sending the signal because it does not necessarily depend on a full studio for broadcast. One advantage of this lower bandwidth requirement is that teachers are able to deliver from their own desks and talk to students in a one-on-one setting. On the other hand, the greater bandwidth used by One Touch™ provides capacity for larger volume signals to be sent and received, potentially enabling greater simultaneous applications; eg: students who log in late for class may download information (eg: Powerpoints) which the class already has, even as the lesson continues (pol-403³).

There are historical similarities in the development of distance education institutions in NSW and the NT which have emerged from the need to provide schooling for remote and isolated students. 'Schools of the Air', which previously broadcast via radio, are found in both the NT (eg: Katherine/KSA and Alice Springs/ASSOA) and NSW (eg: Broken Hill/BHSOTA and Bourke-Walgett Distance Education Centre). In NSW, since 2003, satellite capacity has been extended to primary distance education centres without a previous history of radio broadcast (eg: Port Macquarie and Casino). In the NT, satellite lessons are also broadcast to secondary students, not only those living on isolated properties, but also to those living in remote communities, through the Northern Territory Open Education Centre (NTOEC). The Technical and Further Education (TAFE) system in NSW caters for adult distance learners, either as part of a group within a remote and isolated Indigenous community, or for individuals on remote and isolated properties which are already connected to the satellite system through the enrolment of one or more primary students.

Geographical distance, to the extent that it makes attendance as a regular day student at a mainstream school impossible or difficult, forms the main criteria for enrolment as a distance education student who receives IDL lessons via satellite. Those enrolled in distance education for reasons other than geographical isolation, eg: medical conditions, behavioural issues, or family travel, do not usually receive IDL lessons via satellite (and have not specifically been considered in the study). The total enrolment profile of schools differs; in some schools, virtually all students receive IDL lessons via satellite, while in others there may be as few as fifty per cent.

Differences may occur between schools in terms of how satellite lessons are organised and delivered within the curriculum, just as schools within the same mainstream system may differ. Any differences may be at least partly due to the particular historical development and context of each school, its communities, families and individuals. In some cases, students may be enrolled in a dual mode school. For example, in NSW, one school (Tibooburra) teaches both remote and in class students simultaneously as the lesson is broadcast from the mainstream class. IDL lessons via satellite are just one part of the distance education experience which provides for diverse, 'blended' learning. Students usually have regular face to face contact with other IDL students through 'mini-schools', and frequently through a form of in class contact with mainstream students. In the NT, students who frequently come into 'town' (such as Alice Springs) are often dual enrolled with a mainstream school (e.g. Braitling Primary School) and ASSOA to facilitate this. With home visits and school excursions as well, there may be some form of face to face contact for students as frequently as every two to three weeks, leading one teacher to remark that her school was known as the 'School of the Road'. (BR-906)

³ The alpha-numerical codes in this paper refer to administrative codes, used either by the NT or the NSW research teams to preserve the anonymity of participants.

Correspondence by paper-post, supplemented by a form of audio contact (telephone, audio tape or digital recording), continues to be the major form of teaching and learning for all students receiving IDL lessons. The number and length of IDL lessons broadcasts to students per week varies from around two, up to five times per week in frequency (with the greater frequencies occurring mostly in the NT), and from about 20 minutes up to 90 minutes in length for some lessons. On average, most lessons last for 30-40 minutes. Primary, and some secondary, students receive live satellite lessons in their own home if they live on an isolated property, or in a common venue for those in remote communities. Primary students work with a home tutor who is either, a parent, most usually the mother, or an employed governess (a supervisor may be employed at community centres to assist in lessons for older and adult students).

Decision making about what to teach via IDL lessons and how lessons should be integrated with the paper-post correspondence and face to face contact, differs between schools. In some cases, this decision is explicitly made by a joint staff decision on a subject or theme, such as grammar or maths, on which they wish to concentrate, and then it is followed for a term. In other schools a similar arrangement is made but by each teacher individually. A further example is found in schools where teachers use the on air lesson time in a less structured fashion. Teachers may not always state an explicit rationale for why they chose particular subjects or themes to be taught via their IDL lessons rather than by paper-post correspondence; for some it was just the next issue or topic arising. However, even when the choice of specifically what to teach via IDL may appear to be somewhat arbitrary, most teachers appeared to give specific consideration to how they could use best utilise the visual possibilities of the IDL. As one teacher said, when making a comparison with radio:

‘...what you can do in a couple of minutes [with IDL] that verbally might take you 15-20 minutes and still might not get a result, is huge.’ (ATI-9)

New technologies : change and continuity in practice and outcomes

Fieldwork conducted by the authors and the broader research team has documented a diverse usage of the new technology. Here, we commence by (i) describing what appears to be representative of emergent everyday practice, identifying some of the most frequently used tools and programs and discussing the pedagogical implications. Secondly (ii), we discuss specific examples of teaching using the ‘shared platform’, or ‘desktop sharing’, which has been specifically designed to facilitate interactivity. Thirdly, we focus on how the technology is playing a role in expanding the curriculum. Finally (iv), we explain the impact the new technology is having on teacher/student and student peer relationships.

(i) Emergent Everyday Practice

IDL lessons broadcast by satellite, both in the NT and NSW, demonstrate a pattern in the use of equipment and software features in a manner which could now be considered commonplace. In many respects, these practices may ‘replicate’ everyday aspects of mainstream teaching. The studio camera and the document, or overhead camera, are the most frequently used tools overall, and are very often used in alternating fashion. While these are the most basic features of the technology they are currently used in a way which makes them the most versatile.

The studio camera allows the teacher to be present in front of the ‘class’, most frequently with a direct head and shoulders view. The teacher can then speak directly to camera, as if making eye contact with students, communicating emotions through their face and body

language. The camera angle can be moved around the studio and the focus widened to include guests, whole body movement and large objects, opening up the potential for a variety of methods and resources to be used.



P1 Use of studio camera

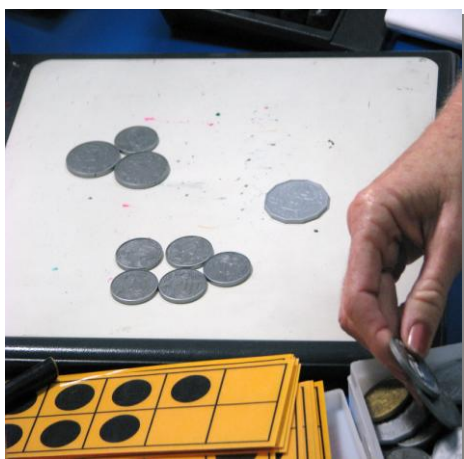
One teacher demonstrated the potential of the studio camera by donning a head lamp which she shone on a globe that she turned, showing how the sun shines on the rotating earth, creating night and day (see P1). This is the vision which the old radio broadcasts most obviously could not provide and the feature most remarked upon by teachers, students, parents and home tutors.

However, it is also important to highlight that this is not a 'silent movie' – sound contact between teacher and students continues synchronously in explanation, reinforced by, and reinforcing, the visual demonstration. (obBR-6)

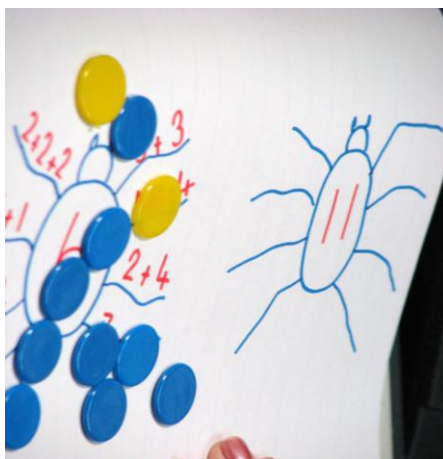
The document (overhead) camera with its zoom feature, allows students to have close-up views of a huge variety of objects, activities and representation of concepts. It is frequently used to show paper based materials from textbooks, prepared sheets, and picture books which may be read and shown, making the connection between text, illustrations and spoken words. Commonly, it is used to demonstrate real time modelling of writing and drawing, corrections of common mistakes, and to record and share student work and responses. Visual modelling is widely cited as a highly beneficial tool for student learning; as one teacher attested:

'The quality of work has improved because they're seeing examples from their fellow students.'(obsBRT-4)

With the audio continuing throughout the presentation, the teacher can question students on the object or problem arising, writing or drawing their answers and ideas for others to see. This principle has been observed in lessons on applied numeracy using coins placed on a tabled sheet under the document camera and the recording of responses to questions on total cost and change, etc., by the grouping of coins (see P2 below). Younger students, in another case, were able to contribute to the creation of number sentences along the legs of a hand drawn 'spider', making each sentence equal the 'number' allocated to the spider by a student (see P3 below).



P2 (see above)



P3 (see above)

Sound remains a critical feature, which is in some ways less spontaneous than was previously the case with radio, but in other ways it is the key to interactivity for the new visual mediums of the studio camera and the document camera. With radio sound, students would identify themselves by name and station (farm, property) and, in terms of the technology, could decide to speak at any time. In fact, teachers could not ‘cut off’ any student from the studio. This presented problems at times for managing discussion and lesson progression generally, as some teachers remember. It also facilitated what are the well remembered group, or choir singing, and the ‘galah sessions’, which are now no longer possible and still missed by some. However, even though all students could sing with radio, it was only the teacher in the studio who could actually hear the voices, so it did little to enhance interaction between students.

Now, with satellite broadcasts, although all students can hear the whole group, in NSW each must speak individually and in order to do this must be ‘called on’ by the teacher. In the NT, students do not need to be called on although this remains the recommended protocol and, with the current limitations on bandwidth, a maximum of only two students can call on at any time. Teachers can ‘see’ who is present from a list of logged on students on their operating screen, rather than just hear who is present. They will also be able to ‘see’ who wishes to speak as students indicate their wish to speak from their home site - sometimes called ‘putting their hand up’ - and are electronically identified on the teacher’s computer. In this respect, discussion, questioning and answering is more teacher-directed than with radio. Given the process of nomination and identification, and the effect of audio delay, it may also take considerable time.

The integral combination of visuals and sound has provided the basis for foreign language learning: as students heard the word *viola* (purple in Italian), they also saw the purple coloured dragon on their screen, broadcast through the document camera. In a reverse of this form, students were asked (in Italian) to use the appropriate term to describe the colour on their screen and the association was reinforced. This pattern was repeated along with the appropriate phrasing for asking about and identifying emotional states (eg: being angry, sad, happy, etc.) as students saw simple images of faces demonstrating the corresponding emotion. Students also periodically saw the teacher as she spoke the words and heard the sounds while seeing the written words, again reinforcing associations in varied ways through vision and sound. This is potentially much more effective than a videotape or DVD because the teacher and students could interact and engage; the teacher responded to student questions and contributions, provided immediate feedback and modified the progression and direction of the lesson according to the needs of the students. (obBR -7)

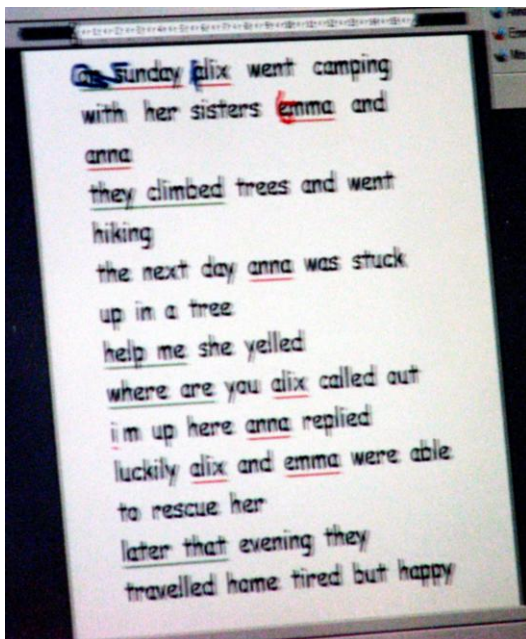
The Shared Platform /Desktop Sharing

This is the space though which students and teachers interact using features of the various programs and applications specifically designed for this purpose. There are some differences between REACT™ and ONE TOUCH™ in terms of the particular programs and applications offered and the ways in which these are organised and accessed. However, here we will concentrate on the common features of both systems in terms of purpose, process, and outcomes. Overall, the features of this part of the system are not used as frequently as the studio and document cameras by most teachers. This may be due to a lack of familiarity, but teachers have nonetheless made clear how important they consider the features:

One of the things I think people have got to start thinking about is how do we make greater use of collaborative tools. (ATI-9)

Some of the activities facilitated through the system, such as showing a DVD, may be considered somewhat passive. However, as would be the case in a mainstream classroom, it is the suitability and quality of the resource, and the way it is integrated and engaged with, which makes all the difference.

The interactive whiteboard (sometimes called Smart Board), as the name implies, is specifically intended to facilitate student engagement in the learning process. This is a shared space which all can see and to which all can contribute. It may be used in a basic manner, similar to some uses of the overhead camera as the teacher engages the students through questioning and their responses are written on the whiteboard. However, it can be employed in a considerably more interactive way as the students are ‘given Ink’ to make their own contributions. Using their word processing tools and drawing tools, or a graphics tablet and stylus, they can draw lines and shapes, type in text, and highlight various aspects in different colours, and so on.



P4

During one observation, a prepared text, complete with punctuation errors, was displayed by the teacher on this common screen. From their home sites students were each able to have their turn in correcting this version directly, and the whole class could view this process and the outcome (P4).

This was a teacher directed exercise; she nominated students to make the changes. Nonetheless, she was in continual audio contact, frequently switching to the studio camera to put further probing questions, and made her choice in response to students' notifications that they wished to make a contribution or ask a question.

Students are, apparently, highly enthusiastic about making their contributions and take every opportunity to ‘jump on’ and make their mark. In consequence, some teachers have noted that they must quickly learn to provide a structured context for responses (obB-3; KGTI-5).

The whiteboard text and images, as well as written responses in the chat box (in the NT) can be printed off by teachers. Not only does this save them time when recording student responses and contributions, it is also extremely valuable for gathering concrete evidence of student learning.

A further example demonstrates how students learn and apply new skills to become an active, creative part of the virtual world. One class of fifth graders has progressively been taken through the steps of creating their own individual web sites on the internet, guided by the teacher through the medium of the shared screen. Although the information posted on the web sites may be simple – 'how to make a cup of tea' or 'my favourite recipe' - it has allowed students to communicate their own information, learn how digital 'texts' are constructed, and begin to develop their capabilities for negotiating the worldwide web. An important additional feature, the 'split screen', literally allows for the screen to be split for a view of two or more applications, which run simultaneously. What may seem at first a complicated manoeuvre is frequently applied, even by the younger students. Each view can be enlarged or minimised as needed easily and quickly providing responsiveness and a degree of spontaneity in meeting student needs.

Return path video (RPV), which allows students to be seen by the teacher and by other students, is the most requested feature by all stakeholders. Currently, it is only available to students and teachers in a small NT trial. Teachers involved in this trial have been able to tap into the student's body language and non-verbal cues in order to assess their engagement in the task, view the strategies the learner employs in problem solving, and work through errors in student work in real-time. As the transmission is synchronous, live and highly interactive, there is a true classroom feel:

Two-way vision is vital! ... to get feedback from the students, ... when you explain a concept to them, to see the look on their face whether they grasp the concept or not, this is classic in traditional classrooms, where you can tell which kids have got the ideas and which ones haven't. (ATI-15)

Expanded Curriculum:

In interviews to date, teachers have stressed that IDL students share the same curriculum, including its objectives and outcomes, with mainstream students. However, it was generally asserted that the IDL system has enormously increased the potential and actual scope of students' curricular and extra-curricular experience in comparison to that possible through radio and paper-post correspondence. In addition, the levels and scope of the students' computer based skills and overall digital literacy were usually considered by teachers and parents to be very high because of IDL.

The significant point is that neither the teaching of digital literacy nor access to additional features, like the internet and interactive programs, would be possible without the IDL via satellite system. IDL technology permits the teaching of many more subjects and skills, as indicated in the examples above and those highlighted by (Anderson 2008) in the teaching of music, than would otherwise be possible. Similarly, art and science experiments are now possible. Teachers engage, stimulate and excite the students by using the cameras to demonstrate art techniques and perform experiments, as one teacher described :

We do boiled eggs, eggs into the bottle, the difference between boiled eggs and raw eggs. I love the visual things you can do. (ATI-15)

The IDL system and software has opened up the possibility of contact and connection beyond the class and school. All at the home site have access to the internet on a 24 hour basis. Students have access to a vast variety of sites and to approved educational portals and programs.

Broadcasts from the school, a central regional studio, or via video-link up with another site have provided a variety of learning activities – yoga, exercise classes and after-school activities. Often these are not interactive in a direct sense and may be more akin to ‘televising’, a point which needs further exploration. There are even specific activities for parents and home tutors on use of the equipment and software, as well as advice on the best way to support their students. A variety of TAFE (post-secondary) courses are available and even a Positive Parenting program, which was ‘really worthwhile’, according to a participant. (KPHTI-92)

There are some quite remarkable examples of this expansion of the curriculum such as the video-link contact made with NASA in Houston, Texas, which enabled students to talk with the astronauts and learn about space exploration - not an everyday possibility. More than a few teachers commented that in some ways IDL students, having previously been disadvantaged, were now advantaged in comparison with mainstream students by the technology. On a more regular basis, individual subject and unit resources are being specifically produced by the education departments in NSW and the NT. Virtually Archibald is a successful example of this, providing students with a virtual tour of the paintings submitted for the Archibald prize in Sydney.

At present, schools differ in the extent to which its teachers collaborate internally on resource production, planning and lesson sharing. When collaboration does occur, it is often an informal arrangement between small numbers of teachers. One school has tried to keep a bank of resources, including lesson plans, etc. but has found the process of storage, categorisation, retrieval and modification quite laborious making this an unproductive exercise. More recently, the idea of inter-school collaboration has been raised in order to maximise the efficiency and possibilities of resource sharing while minimising resource expenditure.

The rapidly emerging technologies have presented some challenges to IDL teachers and schools. Not only must teachers be trained to use the new tools and programs, the schools need to update the format of their existing resources (video to DVD; audio tape to digital recording; etc) and consider new resources, all of which require teacher time and a specific allocation from the school budget. The production of such resources is a developing field and represents as much the fact that the mainstream schooling sector is also changing to incorporate and utilise the digital world (eg: Connected Classrooms in NSW and the activities of the MCEETYA ICT in Schools Taskforce, see MCEETYA 2004).

Learning Relationships

IDL has created a new dynamic in learning relationships between teachers and students, and student peer relations. The importance attached to the personal visual image is demonstrated by the practice in the NT of attaching a small photograph of each child to their on screen icon which becomes evident when the ‘call on’ to speak. In support of this, Dede (1990) suggests that having photographs of students while they are speaking provides a personalised experience for students when video is not possible. Live vision allows teachers to use their facial expressions and body language for more effective communication and response. This allows them to establish a more particular and personal teaching identity. Inviting other guests creates a different context of interaction which often allows a broader range of the teacher’s skills and personality to be demonstrated.

Eye contact is not made between teacher and students as such but the illusion of this is gained through the teacher looking directly at the camera, backed up by their conversation, narration or instruction, which takes this beyond being a mere televisual communication - and some younger students are reported to have believed at first that the teacher can see them! Teachers have reported that familiarity with their face is a key feature for the process of orientating kindergarten and new students to the school experience. The precise extent to which a view of the teacher enhances student engagement in learning is yet to be precisely discerned but some preliminary examination of student experience suggests that it may initially engage students and aid enormously in establishing a connection with the teacher. However, the initial engagement is less likely to last without active student interactivity, an outcome suggested by research into ICT more generally (see Ainley and Enger 2005).

Teachers usually appear on camera in front of a background which identifies the school and/or the nature of the rural or isolated bush life with which the school is identified, or the work of the students. This is a small part of the continuities and connections which aid in forming the school community. The radio tradition of the school song established by some schools continues, backed up now by visuals of the school crest and motto. School assemblies and morning messages are common features of mainstream schooling which can now be conducted via IDL broadcast. These add to a sense and actuality of a unified school community with student achievements lauded and on display, and common events announced. Not only may student work be shown during lessons and assemblies but students who are visiting town may also join in on screen. School home pages may provide access for students at any time to a constantly updated 'school newsletter' of student work, achievements, photos from school events and a listing of upcoming events.

Asynchronous communication, particularly outside of class forms a highly significant part of the learning relationship between students and teachers and in assisting the cohesion of the school community. A regular and specific form of feedback has continued from the days of radio to accompany the correspondence material sent by post between the students and their teacher – audio tape cassette. This allows for highly specific feedback, instruction and encouragement to be communicated. Students may also practice and demonstrate their reading skills. The latest version of this is a digital recording (DEC), which, unlike the audio cassette that is sent by post, can be sent virtually instantaneously by email. Some teachers consider the speed with which these oral communications can be sent as a huge benefit. However, some point out that the speed of transmission means that they can more easily be sent and give examples of quite huge numbers of these being received from students and parents, along with expectations for replies to each.

Email contact between students and teachers may occur during the lesson although this may be more often than not to indicate problems with broadcast reception. More usual is the use of email, and sometimes telephone, outside of lessons between students, parents, home tutors and teachers in regard to school work and issues, allowing for personalised assistance and advice, and the transfer of school work. Initial findings suggest that email is a frequent and regular form of contact between students which is, in theory at least, unmonitored and unstructured by teachers, parents or tutors. It may be used to discuss school work but is just as likely, if not more so, to be used for social contact by students, and also parents and tutors. Chat programs function in a similar way, although students are not allowed open access to all internet applications. Both provide the means for the development and maintenance of peer friendships across the vast distances and appear to play a very critical role in making arrangements for face to face meetings. For parents and

tutors it has also become a means to organising their participation in structured face to face contact, including the regular mini-schools.

Emerging themes and issues for future practice

The satellite system presents diverse and dramatic possibilities in distance education with its visual capabilities and provision of high quality sound. Teachers have a critical role in giving effect to these possibilities through their practice, often adapting approaches that are commonly used in mainstream teaching - demonstration, modelling, reinforcement, problem solving, questioning – which have the potential to be highly engaging and effective. The ongoing research of the ARC Linkage project into the reception of IDL lessons should provide further insight into the ways in which students engage with the lessons and the technology, and the role played by the parents and tutors who form such a vital part of the larger ‘classroom’ (see Lee and Wilks 2007).

Observed lessons have demonstrated that interactivity is possible with even the most basic features of the system, although the possibilities for this are likely to be expanded as more teachers become familiar with all the features of the system. This raises the importance of ongoing professional development, not only for teachers, but also a form of ongoing training for the parents and home tutors. The tendency for the IDL school community to have close and frequent contact both on and offline, presents a valuable opportunity for such developments to be shared. IDL also facilitates the possibility for accessing knowledge and making contacts far beyond the local, regional or even national boundaries. The effects of this on student learning will be an important consideration in the ongoing research of the ARC Linkage project into IDL.

Return path video for two way vision is considered by many to be an almost inevitable development which will be of great benefit for students and many are already considering how they will manage the increased privacy and bandwidth issues that may be presented if RPV is introduced. Given the apparent success of the NT trial and the already widespread appeal it appears to have because of the benefits it brings to teaching and learning, it is likely that cost may become the remaining factor on which the issue is decided.

The progressive digitalisation of learning in mainstream schools also presents an interesting circumstance for consideration. Resource collaboration is a likely prospect at the moment. Whether and how the developing digital connectivity between schools will affect existing IDL schools, students and the teaching and learning process, remains to be seen.

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