Effective video conferencing in the classroom

Summary report from six case studies

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1   Introduction

The focus of the research was six schools chosen by Becta for their reputation as leading-edge institutions in the effective use of video conferencing. They were all ICT-rich schools, where video conferencing was seen as an integral part of a suite of technologies that could be used to support learning.

Becta requested each school to take part in the case study project and they were free to accept or reject this invitation. These six schools (two primary and four secondary) were therefore selected for their reputation by Becta in the sense that they were prepared to put their video conferencing activities to the test of an intensive investigation.

2   The case study schools

Because the schools had been chosen precisely for their range and variety of video conferencing activity, they clearly do not constitute a representative sample of all schools. In other respects, however, they exhibited a range of characteristics typical of schools in general. The schools were drawn from a wide geographical area, from the south coast to the north-east and represented both urban and rural environments. There was also a spread of schools in terms of size, ethnic mix and socio-economic background of pupils.

The two primary schools were, respectively, a small school drawing on a largely rural population and a large urban school serving an area of economic disadvantage. Both catered for pupils from foundation stage through to Key Stage 2. Although video conferencing was a relatively new activity for one of the schools and mainly restricted to KS2, plans were in place to broaden its use across the school. In the other school it was already used regularly in all subjects and at every key stage and fully embedded into schemes of work.

The secondary schools were all specialist schools, though they differed in the specialism they offered, ranging from technology, through languages to the Arts. While the concentration of video conferencing events tended to be in the area of the specialism, none of the schools restricted use only to staff or students in that specialism. The closest match between the specialism and video conferencing was to be found on the languages college, but even here, access for other departments was also supported. As will be seen, the patterns of video conferencing use across the six schools therefore demonstrated difference as well as similarity, as video conferencing was tailored to the perceived needs of each individual school.

All but one of the schools had been using video conferencing for at least three years. Compared to other ICT-based systems, the purchase, installation and maintenance of video conferencing equipment was seen by the schools as relatively straightforward.

3   The evaluation

All schools completed a baseline survey questionnaire in which the basic social characteristics of the school, the nature and location of video conferencing equipment used and past and current patterns of use were established.

After initial contact was made, arrangements were made for intensive case study visits to each school. Three days had been assigned by Becta for this aspect of the research. One of those days was allocated for preparatory and follow–up work within the school. Given the heavy schedule of activity that was being requested of the schools on the actual visits, this was an essential investment in the success of the project. The remaining two days were taken up with visits by the researchers, sometimes consecutively and sometimes with a gap of about a week between them, depending on the individual circumstances of the school. The main reason for 'split' visits was the unavailability of the 'lead teacher' (the member of staff with prime responsibility for the co-ordination of video

conferencing activity) over two days, an indicator of the busy workload of the prime movers of video conferencing programmes.

During the two days of actual visits, a range of research events took place. As the main 'champion' or 'driver' of video conferencing in the school, the Lead teacher was the main source of information about video conferencing in the school, though these data were checked through independent observations and interviews with other informants, including teachers with video conferencing experience ('teacher users'), members of the school management team and students. The principal in each school was also interviewed.

The schedule for the lead teacher interview(s) was detailed and comprehensive, taking at least an hour and a half in total. The Principal and teacher users were interviewed using a shorter schedule typically occupying around 30-40 minutes. Similarly, student users were also interviewed in small groups about their experiences and reactions to the video conference experience. All interviews were recorded with audio tape. Together these varying perspectives provided a comprehensive picture of the range, nature and impact of video conferencing in the respective schools.

The visits were arranged to coincide with planned video conferencing activity so that all opportunities to observe video conferencing activities were taken. Key events were captured using a hand-held video camera. Detailed observations were recorded using a structured schedule devised specifically for video conferencing events. Subsequent to the event, detailed notes were made on the basis of these observations. The teacher in charge of the event was also interviewed both prior to and after the event in order to ascertain the aims and perceived effectiveness of the observed session. Where possible, the student group interviews referred to events that had been observed. Open-ended discussions were also held with 'far-end' participants in the limited number of cases where this proved possible.

In addition to the two main days of the school visits, follow-up work was carried out where issues emerged during analysis that could usefully be explored with members of the school. This was done either through email or telephone. Draft reports were also checked by the lead teacher in the school for accuracy in factual matters.

4 Findings from across the six case studies

4.1 Core issues

4.1.1   Nature and location of equipment

The basic decision in locating video conferencing equipment is whether to opt for flexibility (and usually this implies lower specification cameras and more simple uses) or for a dedicated video conferencing room which can be developed into a sophisticated multi-media space. In most of the schools the start-up equipment was largely mobile and moved around to different locations when required. However, as the use of video conferencing intensified, the schools moved towards more fixed provision, usually located in a classroom associated with the departments most often using the facilities.

The more advanced secondary schools, after a period of consistent use, had developed more studio-like provision, with a number of associated technologies also included. However, even these schools had not given up less sophisticated facilities, but in common with the other schools used them for specific forms of video conferencing. For example while the main video conferencing activity in all of the schools required high-quality equipment capable of catering for groups of students and in many cases whole classes, all had, for relatively small sums of money, installed simple webcam-based systems on a number of machines. These enable greater flexibility in terms of access, although their educational use is somewhat limited to relatively low-grade, one-to-one communications.

Interestingly there was an indication in the more advanced secondary schools that increased use of video conferencing may be leading to a reconsideration of the centralised or fixed-facility model. Thus in one secondary school, future plans included the installation of medium-specification equipment in a number of departmental locations, thus avoiding the need for classes to move to the technology or to fit in with a booking system.

The two primary schools, like their secondary counterparts, had in addition to a number of webcams strategically placed around the school, one main video conferencing unit for the whole school, semi-permanently fixed in a teaching room. In one sense, the primary schools had the edge over the larger institutions because the number of pupils competing for video conferencing resources was much lower. Theoretically at least teachers had much greater opportunity to build video conferencing into curriculum activity. Their smaller size compared to a large secondary school also means that moving a class to and from the video conferencing location was also much less of a logistical problem. However, their relatively smaller budgets means that they also have much less flexibility in making decisions to expand should that become desirable, a situation already reached in the larger of the two schools.

4.1.2   Getting started

In most cases the initial impetus for engaging with video conferencing came from involvement in particular projects These were often driven by the interest of one or two individual teachers who saw in the technology an opportunity to innovate or to improve an existing but more traditionally-mediated exchange with an external person or organisation. Funding for these early experiments came from a variety of sources, an arrangement with a commercial sponsor in one school, an LEA initiative in another and so on. While in some cases this support has continued in some form, all schools have found new or additional sources of finance, such was the positive impression gained by those who had used the facility. All schools have found money from within their own budgets to further develop video conferencing.

In almost all the schools these early 'champions' remained as key enthusiasts for the further development of video conferencing in their respective schools and in three cases this was the Lead teacher. In all schools, both primary and secondary, the lead teacher - main driver of video conferencing - was a member of the senior management team, who could choose to devote (or were allocated) sufficient time to develop activities. In two secondary schools the Lead teacher was a head of department who had been given time off-timetable to devote to this area of work. This allowed a more concentrated development of video conferencing activity and reduced the number of ad-hoc conferences. In particular this freedom helped to enable the development of programmes of video conferencing in particular curriculum areas or aimed at cross-curricular themes.

4.1.3   Patterns of use

In most schools the approach developed during the early days of video conferencing tended to set a pattern of routinised use which continued during and after these initial trials. So for example the replacement of visits from local University tutors with 'virtual lectures' in one secondary school was followed by a number of conferences with other 'remote experts'. Developing more varied approaches working with video conferencing came more slowly, often implemented by individual teachers becoming interested in using the technology in certain ways. Nevertheless, while most of the schools had established a predominant preferred mode of video conferencing, none only used one specific format, and between them the six schools covered a broad range of approaches to video conferencing.

As in the 'Video conferencing in the Classroom Project Evaluation' (Becta, 2004), observations of video conferencing activities suggested a continuum of modes of use. Initial exposure to video conferencing of either staff or students usually involved some form of 'familiarisation' process involving one or more events. Here, the structure of the conference was relatively loose, even where scripted, and the 'rules of engagement' were more open to negotiation between participants. More

routinised uses involved the substitution of the classroom by a video conferencing event but using traditional pedagogical techniques at a distance. These occurred for example in minority subjects where the near-end school did not have the requisite expertise in-house. Other routine uses involved the sharing of teacher expertise across distant locations and the training of teachers through remote interventions.

In all observed conferences, the mode of use was clearly linked to the purpose of the lesson. The majority of uses were to enhance existing curriculum topics, involving a variety of approaches from expert 'seminars' to class-to-class exchanges. The location of video conferencing 'partners' ranged from other schools to museums to large-scale organisations, and in terms of their location from local to national to international. Many of these were typified by the 'one-off' event, which involved contact with remote others, often experts provided by national or local organisations concerned with a specific curriculum area or more general cross-curricular issues.

4.1.4   The virtual seminar

Sessions designed to extend knowledge and understanding of a particular topic typically involved communication with a subject expert. This 'remote expert' or virtual seminar model was seen by all the teachers as a simple-to-organise and cost-effective way of offering the students the world beyond the school gates and thus enhancing their experiences. There were three main ways in which this model operated.

- The use of 'off-the-peg' sessions by experts, for example in museums and galleries, often giving access to artefacts, documentation and audio-visual resources that would be otherwise unavailable. Many of these sessions were arranged, cost-free, via global-leap.com which offers a menu of video conferencing activities matched to curriculum specifications.

  An illustration of this approach was a Y8 geography class, in a school serving a semi-rural community, in conference with an LEA expert from in an inner-city authority. The session provided an authentic urban context which helped the students to consolidate knowledge and understanding of their current focus on regional economic activity. Observed examples of this kind in the two primary schools included exchanges with history and science experts in UK museums (covering topics such as the Vikings, the properties of light and life in Tudor times) and an international session on food and travel with a NASA representative in the US.

  A version of the above approach whereby schools used commercial services to deliver a complete course or module. In one of the secondary schools for example, remote delivery of A-level specifications to a small group of students at a dedicated timetable slot each week in effect replicated many of the elements of a traditional class session. This allowed the systematic delivery of knowledge and skills suitable for the Advanced level examination. From the students' perspective, the only real difference from a school-based seminar was that the sessions were delivered remotely.

- Sessions which were organised by the schools themselves with known contacts. An example of this in one of the secondary schools was the involvement of tutors from a local Higher Education institution for 'virtual' politics and history lectures. Schools also took advantage of existing peer 'experts' such as students in other (local or distant) schools. In one of the primary schools for example, a Y6 English group discussed a story with pupils in a local school who had been studying the same text, focussing on aspects such as narrative, character and plot. A secondary school example was through established contact with an 'exchange' school for class-to-class exchanges in modern foreign languages.

4.1.5   Innovation

As all but one of the case study schools had been video conferencing for some time, they had the time to develop more innovative uses of the facilities to create more novel experiences for staff and students. These often involved exploiting the potential for interactivity inherent in the technology.

Examples here include joint projects with non-European students and live training sessions in which the distant expert was invisible to the students but had video access to the session and wireless audio connection to the trainee teacher. The more innovatory uses could be either simple or complex, and while many involved just two sites, some were multi-location events.

In some of the schools, the observed exchanges were multi-faceted, detailed and involved a series of events rather than one-offs. An example of this was a series of discussions between UK 6th formers and their counterparts in a US school on a set of student-negotiated topics on culture and society. More 'spectacular' events tended to be in media suites, using a range of associated technologies such as document cameras and were planned to deliver a range of learning outcomes, such as thinking skills, curriculum knowledge and global citizenship understanding.

4.2 Preparing for video conferencing

4.2.1 Establishing relationships with video conferencing partners

As in the early days of email contact between schools, identifying suitable partners with whom to conference was an important issue for all of the schools in the study. To a greater or lesser degree all of the schools used the services of global-leap.com to locate and arrange contact with other schools or with subject experts in institutions such as museums and galleries. Although as noted above these were designed to fit with a particular curriculum topic, in many cases (especially the virtual seminar-type sessions) these represented 'one-off' events. Other conferences (for example MFL exchanges) formed part of an ongoing series of contacts in which relationships were built up with the partner school over time.

Forming systematic and trusting relationships between two or more institutions took time and involved a constant round of planning. Matches between the curriculum demands of all the participants had to be identified and timetabling issues had to be addressed. The latter issue is especially important where partner schools or institutions operate in a different time zone.

Several of the schools had found it difficult initially to make contact with schools in other countries which might be capable of engaging in video conferencing activities. This was often because the remote schools did not have any funding for experimentation. Some of the schools managed to find ways of supporting the process with European partners, so that one secondary school sent equipment and training personnel out to the schools to ensure continuity of contact. In another, Comenius funding had enabled sustained contact between the school and a European partner, including mutual visits between teachers.

4.2.2 Planning the conference

Like any other 'regular' lesson, the effectiveness of a video conference session is highly dependent on thorough teacher preparation. In the shorter term, preparing for any individual video conferencing session, even those which are relatively routine, can be considerable. At the less intensive end of the spectrum are activities involving a single class communicating with a remote expert, since these tend to be led by the far-end tutor. Preparation here is generally a relatively straightforward process of agreeing the focus and content of the session beforehand, in some cases accompanied by pre-conference materials supplied by the expert institution.

At the other end of the scale are sessions which involve exchanges between two groups or classes, involving teachers at both ends (or more in the case of multi-point conferences). In such circumstances detailed discussions need to take place between session leaders at each site in order to establish the timing, purpose and content of the session, the rules of engagement, the processes involved and the respective roles of participants (teachers and students). The joint preparation of curriculum resources may also be involved. These negotiations can take the form of email, telephone or video conference contact (and often all three). In one secondary school for example routine

planning sessions with a European partner school were conducted via video conferencing during lunchtimes or after school, supplemented by email and telephone exchanges.

4.2.3 Preparing the students

Setting up a conference also involves preparing students for the planned activities during the session. In all of the observed conferences teachers had identified topics for discussion and talked through possible questions, or had prepared 'scripts', to ensure the smooth running of the conference. Although these preparatory activities take time, all the teachers interviewed agreed that despite the workload that this implies, it was worth the effort because of the motivational and educational impact of the sessions.

Prior to sessions teachers also discussed with students their conduct during the conference. This typically involved reminding students new to video conferencing of the need for appropriate behaviour given the novelty of the situation, but also explaining video conferencing protocols such as speaking clearly, listening to the far-end participants, being aware of the 'delay' and so on.

4.3 Conducting the video conference

4.3.1 Technical issues and rules of engagement

One of the factors which was said to be off-putting for a minority of teachers was a concern about using technology and the possibility of technical breakdown. In fact the technology was not seen as difficult by those teachers who had used it, a number indicating that learning to use it had been a fairly straightforward and speedy process.

Nevertheless, the more sophisticated aspects of the technology did need to be thought about in terms of their potential impact on the event. For example, some observed video conferencing sessions were quite noisy events, partly because of the excitement of the students involved and factors such as not 'muting' the sound at appropriate moments could create complications and a lack of clarity. In others, technical difficulties (such as problems in making a connection) affected the length or scheduling of the session.

The most effective sessions of video conferencing occurred where participants (in all locations) were clear about the purpose of the activity and its place within the curriculum topic or scheme of work being followed and where explicit rules of engagement had been negotiated among the parties. These rules included such aspects as, the roles of the far-end and near-end teachers/experts, how to manage taking turns to speak or respond (and in some cases in which language), how to request information and get that request acknowledged, how to ensure that the agreed curriculum content is covered while allowing student autonomy and so on.

4.3.2 Role of teachers/experts

One aspect of the observed sessions that stood out was the importance of the quality of the 'experts' at the far-end. Good teaching from the far-end was an integral part of the educational success of the session, so that simply gaining access to an expert (for example) was not of itself a guarantee of an effective event. Conversely, where the far-end expert was less sure of good teaching techniques and/or where disseminating knowledge and information dominated exchanges, students and teachers expressed less satisfaction with the event. In particular, it was noteworthy that the students were eager to engage with the interactive elements of video conferencing and were less likely to want to be 'lectured at' from a distance. However, even here, the students thought that having access to remote experts, however didactic, was preferable to 'just sitting in the normal classroom'.

Given the importance of the teaching ability of the remote expert, it was also noticeable that the role of the near-end teacher was essential for an effective conference. This was partly to do with the preparation needed, but was also the case during the actual conference itself. Where there were classes involved, the near-end teacher has an important mediation role to play. This can take several

forms, ranging from managing the contributions of the students, through interpreting inappropriately pitched questions for experts unfamiliar with the age group they are addressing, to intervening to give the near-end students opportunities to ask questions and make contributions.

In a small number of cases where remote experts were involved, the teacher intervened to move the session forward in order to ensure full coverage of the agreed topics or to ensure opportunities for pupil engagement. In the majority of the observed conferences of this kind, however, this role was facilitative rather than directive, so that while the presence of the teacher was essential for the smooth running of the conference, s/he rarely took a direct instructional role. This had the effect of giving greater autonomy to the learners to interact directly with the 'far-end' expert.

4.3.3   Managing an effective conference

The implication of this is that it is not enough to put large numbers of students in a video conferencing environment and then leave them to it. These events have to be managed if they are to be effective. Where there is no near-end teacher present, for example, effective activity can still takes place with small groups receiving instruction from a remote teacher, but it is more difficult for students to challenge the power differential between themselves and their remote teacher and get their needs met.

In the case of a class-to-class exchange, the situation is a little different. In almost all of the observed or reported instances of this kind of conference, the mediating adults at each end of the conference were teachers of their own class, meaning that pupil management as well as the management of the interchange itself was in the hands of experienced classroom practitioners. However the involvement of two (or more) sets of students adds an additional layer of complexity in that all teachers involved need to be clear about 'rules of engagement' if the dialogue is to be productive.

Any uncertainty or lack of clarity at just one of the locations can result in a fragmented exchange. An example of this was an observed conference between two groups of Y6 pupils where the far-end tutor was unexpectedly called away, leaving the near-end tutor trying to manage both sets of pupils, while the far-end group attempted to organise amongst themselves. The result was a certain amount of confusion, diminishing the effectiveness of the session. However, teachers were generally able to identify problems about the conduct of the session, and often built this into their post-conference discussions with students, helping to establish good practice for future sessions.

4.4 Embedding video conferencing into the curriculum

While strong leadership and the distribution of responsibility for co-ordination are necessary conditions for the curriculum integration of video conferencing, the process by which this occurs is also of some importance. A critical dimension found in all of the schools was a clear policy that video conferencing activity should be purposeful and educationally sound. With the exception of occasional 'special events', this generally meant ensuring a careful match against National Curriculum targets or the demands of examination specifications.

4.4.1   Involving teachers

The schools were at varying stages of curriculum integration, from its general inclusion in curriculum planning to its formal introduction into schemes of work. While to a large extent this variation reflected the time that the different schools had been using the technology, a major consideration was whether the use of video conferencing was a matter of choice or expectation. In all but one of the schools, teachers were encouraged to explore the potential of the technology but were not required to do so. The rationale for this approach was that teachers who came to video conferencing did so willingly and thus explored its use with enthusiasm. This in turn was more likely to lead to a realistic assessment of its usefulness and its purposeful inclusion in the curriculum.

One (primary) school however did require all staff to use video conferencing on at least two occasions per term, ensuring that the technology was used regularly and at all key stages, an expectation which was incorporated into performance management targets. Teachers and principals in the schools which consciously rejected this model argued that it was more likely to lead to a 'bolt on' approach rather than video conferencing being 'built in' to curriculum objectives. However, in the school which did adopt this policy, observations and reports of video conferencing activity revealed a rich and varied pattern of use which clearly demonstrated the latter, while all teachers interviewed fully supported this strategy.

What these findings suggest is that there is no 'one way' to approach this issue, and that the educational context into which video conferencing is introduced is a core consideration when seeking to fully embed its use into the curriculum. In the example of the primary school above there is a long history of innovative use of ICT which is fundamental to its teaching and learning philosophy. Teachers who work there are not only used to, but openly embrace new technology. In this context, the introduction of video conferencing was perceived as an opportunity rather than an imposition.

This is not to suggest that in other schools teachers were resistant to new ideas and in all of the technology was a key element in their curriculum planning. A positive approach to new developments too, was characteristic of all of the case study schools, as the use of video conferencing itself demonstrated. As with any educational innovation, working with, rather than against the prevailing culture within the school is the key factor to its successful implementation.

4.4.2   Involving pupils

Ensuring that video conferencing is integrated into the curriculum is of course dependent on student acceptance as much as it is on teachers taking it on board. The limited number of pupils who were less enthusiastic cite such factors as 'shyness' or 'novelty' as the reason that they were unwilling to participate. Most of these resisters eventually joined in after watching sessions as 'lurkers', as they were persuaded that there was nothing to fear, while for some the experience of simply 'having a go' (albeit nervously at first) was sufficient to convert them.

There remains an issue of how the teacher is to handle the very small number of persistent 'refusers'. To some extent the strategies employed are little different from those to encourage reluctant students in any lesson. In addition, video conferencing was explained by some teachers as a chance to practise skills that would be useful in the world of work in a safe and familiar environment. However, none of the schools were willing to insist that all students participate if they really objected and most relied therefore on voluntary systems for involvement. The exception was the post-16 students in the language college who were required to have a regular one-to-one video conference with a student from the target language, as it was seen by both students and teachers as the best way of gaining authentic access.

In reality, rather than having to make efforts to involve reluctant students, in some schools the more immediate issue was handling the demand from students once the word got round of how enjoyable it was. More than one teacher expressed the view that the further development of video conferencing would be driven by student demand, and this was therefore a positive endorsement of that judgement, and in that respect a welcome 'problem'. One resolution was to choose those who would be involved in any session either as classes or as smaller sub-sets of classes. Some used other programmes such as the gifted and talented cohort as filters for the experience, or identified students at the other end of the ability range.

4.5 Impact

All of the teachers who had been using video conferencing for some time were enthusiastic about its educational potential, citing a range of benefits for pupils. These included gains in:

- motivation
- engagement with learning
- subject knowledge and understanding
- speaking and listening
- retention of information
- self-confidence
- social and communication skills
- awareness of other cultures

Some teachers indicated that these improvements, in particular confidence in open discussions, had for some pupils been sustained beyond the immediate experience of the video conference.

The overwhelming majority of students were also openly positive about video conferencing, identifying a similar list of advantages. The opportunity to learn from renowned experts and the authenticity of the experience were also among the most regularly commented upon benefits.

Teachers were less able to identify specific gains in performance, most arguing that it was too soon to be able to identify a direct link between video conferencing and attainment. Moreover, as several teachers and school managers pointed out, numerous other variables – including a generally positive attitude towards innovative practices – were likely to be contributing to identified improvements in test and examination results. In this respect, video conferencing was regarded as an important component of a generally forward-thinking attitude.

4.6 Spreading the message

4.6.1 Beyond experimentation

One of the key issues that arose in many of the case study schools during the early days of video conferencing was how they could sustain and build upon their first forays into using this technology. In some schools this was in part a financial question, since these early projects had been funded externally, the issue being therefore how to keep going once the initial funding or support came to an end. Even in those schools where funding was not the central issue, the investment in time and energy to get video conferencing up and running were often significant.

The historical accounts offered by those involved nearly always demonstrated a reliance on a key person with the willingness to experiment and a commitment to drive things forward. A potential problem arises if this champion is for one reason or another unable to continue, so that video conferencing activity could drop away. For example in the case study schools a variety of factors including promotion within the school or to another external post, maternity leave and retirement had resulted in gaps in provision.

While all the schools restored the impetus eventually, the history of video conferencing was not therefore always a smooth one. Rather there were peaks and troughs of activity, often related to individual circumstances. The message from the study is therefore that the successful development of video conferencing is dependent upon moving from a over-reliance on the willingness of key enthusiasts towards a broader distribution of responsibility.

4.6.2   Policy

As noted earlier, five of the six schools had decided against a policy which required individual teachers to use video conferencing, In the same vein, these five opted not to compel all departments (or key stages) to use it, although all encouraged its wider use in more general terms. In part, this decision was due to the worry that if video conferencing did take off in a big way, then current provision could not be expanded or funded sufficiently to satisfy potential demand.

However the crucial element of policy for the promotion of video conferencing was not whether or not video conferencing should be a compulsory activity, but that its development should be part of a more general strategy where structures to support innovation and an element of evaluation for new ventures was built into planning procedures. In one school for example an 'Innovations Group' had been set up with the specific remit of identifying new approaches to curriculum delivery, of which video conferencing was a central component. In the school which had chosen to require teachers to use video conferencing, such an attitude was key to its teaching and learning philosophy and fully supported by all staff.

The degree to which responsibility for video conferencing development was distributed varied from school to school. This in turn partly determined the extent to which its use has spread from the initial users to the wider school. For example in one of the secondary schools, a languages college, the strategic decision was made to focus activity in MFL. Use elsewhere was somewhat sporadic and dependent on the enthusiasm of other subject leaders and the availability of the equipment outside of the needs of the languages department. In other secondary schools, a generally more inclusive approach to spreading its use prevailed, although none had yet got as far as involving all subject departments.

The contrast between those schools where take up had been greatest and those where it was a relatively bounded activity was greatest in the two primary schools in the study. In the one, video conferencing was used by every teacher, in all subjects and across all key stages, while in the other, although several subject areas were covered, it was used mainly by one teacher with KS2 pupils.

4.7 Conclusions

In a growing number of schools the use of video conferencing to enhance teaching and learning has moved from a fringe activity to an important tool for enriching the experience of students and enhancing the teaching and learning process. The six schools which are the subject of this report are among those leading these developments. Having explored the potential of video conferencing over a number of years, they represent rich sources of evidence for what makes for educationally effective use of the technology, how that use is embedded into curriculum planning and classroom practice and how that good practice is spread throughout the school.

The findings from the case studies point to a range of factors upon which that this process is contingent. These factors are summarised below in response to three core questions:

1 What helps to make a video conference successful?

A number of conditions need to be satisfied if the conference is to 'work'. These include:

- The identification of appropriate partners/experts
- Careful pre-conference planning to include:
  - agreed focus and content with far-end participant(s)
  - (joint) preparation of support materials where appropriate

- agreed 'rules of engagement'
- preparation of pupils for:

  - their role/involvement in the session (e.g. preparing questions, script)
  - appropriate behaviour
  - careful attention to speaking and listening

- Appropriate procedures for dealing with technical issues to include:
  - familiarity with video conferencing equipment and controls
  - pre-conference test calls/equipment tests
  - basic technical 'know-how' and/or access to technical support
  - contingency plan for connection failures or other technical problems.

- Consideration of environmental and other factors such as:
  - external noise
  - design and location of room
  - appropriate numbers of pupils for a given conference.

2 What makes for an educationally effective video conference?

We define an effective video conference as one which meets 'fitness-for-purpose' criteria. That is where a conference:

- Has a clearly articulated educational purpose.
- Is matched to curriculum needs and specifications.
- Fits naturally within a curriculum syllabus or topic sequence.
- Forms part of a range of approaches to the delivery of the curriculum topic.

or

- Represents a viable alternative to delivering that topic/course whole

3 How is video conferencing to be sustained and developed?

All of the schools case study schools had moved from localised experimentation by enthusiastic teachers (First phase) to moving out into the school more generally (Second phase) and were, at the time of the study, at various stages of fully embedding video conferencing into curriculum policy and planning (Third phase) .

This process is dependent upon:

- First phase:

  - Time and resources for 'champions' to develop good practice.

- Second phase:

  - Modelling good practice for other interested colleagues.
  - Encouraging and supporting new users.
  - Distributing responsibility for the co-ordination and development of video conferencing activity.

- Third phase:

  - The wholehearted support and commitment of SMT.
  - A culture of innovation.
  - A whole school approach to the inclusion of video conferencing as part of the school's teaching and learning strategy.