

Evaluation of the Suitability of Distributed Interactive Videoconferencing for use in Higher Education

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"To put together a distributed educational event requires a massive amount of planning and a clear idea of how the telecommunication services serve the purposes of such a distributed event"

Professor B. Cohen, University College, London

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Management Summary

This report describes an evaluation of an international distributed interactive Summer School (ABC '96) held 9-12 July 1996. It discusses the issues involved in distributed events with the aim of providing useful input into the use of distributed interactive videoconferencing in higher education.

The evaluation used three methods for collecting data; a structured interview with the speakers and presenters, a questionnaire with participants, and data collection by an experimenter, following a checklist of issues.

The results section of this report is divided into issue sections: technology infrastructure, users viewpoint, speakers experiences, participation and interaction, and presentation.

The main conclusions from this work are as follows -

The technology to deliver distributed interactive educational events is now at a stage of development such that its **routine application can be considered**.

Delivering educational value, through the use of this technology can be achieved, and offers huge potential for creative use to serve educational purposes. **There are however** problems in ensuring that **educational goals** can be achieved.

Technical issues remain to be resolved so that this technology can be deployed regularly and on a routine basis. Currently, to achieve clear educational rather than technical goals requires a major focus on presentation and production standards, and an enormous organisational effort both at the technical and educational levels.

There is a clear need, in order to maximise educational benefit, **to maximise the level of interactivity**. This must be carefully planned, and executed in a professional manner.

The integration of computing and telecommunications technologies is not sufficient in itself. To achieve educational objectives, there is an a priori requirement to integrate the technology domain with the educational domain. The use of broadcast standards for presentation and production values currently offers the best approach.

There needs to be **further work to investigate the organisational requirements of higher education establishments** in order to support similar types of events. These events need to be co-ordinated and managed in order to take account of all of the multi-disciplinary aspects. As indicated in earlier reports¹², videoconferencing in higher education establishments is currently approached from a number of different organisational sub groups, such as computer services, computer science, audio visual services, distance learning groups and others. *There needs to be an advisory team set up to advise on the technical, production, presentation and educational quality aspects of undertaking distributed teaching events.*

¹Carter, C., Clarke, A., Graham, R., Pomfrett, S. (April 1996): *The use of Video Conferencing in Higher Education*. SIMA (Support Initiative for Multimedia Applications) Report Series (20), ISSN 1356-5370

²Butters, L., Clark, A., Hewson T., and Pomfrett, S. (September 1994): *The Do's and Don'ts of Video Conferencing in Higher Education*. SIMA (Support Initiative for Multimedia Applications) Report Series (4), ISSN 1356-5370

1 Introduction

The following report describes an evaluation of an international distributed Summer School which was held 9-12 July 1996. The evaluation aimed to assess the suitability of this type of distributed videoconferencing for educational purposes, and to evaluate the impact of improving the quality of presentation, of production and of management of such an event. It is intended that feedback will be provided into future ABC and other similar distributed interactive educational events.

The fourth Advanced BroadBand Communications Summer School, ABC '96, was an international distributed event where an interactive tele-education application was used to distribute lectures, discussions, panel sessions etc. Physically disparate sites were connected into a single lecture room. It was organised by Project NICE (AC110), sponsored by the ACTS programme of the European Commission. The Summer School was the fourth consecutive "International Distributed Summer School on Advanced Broadband Communications". The theme was the convergence of Information Technology and Telecommunications.

The event was held over four days, simultaneously at 18 geographically separated sites, of which five of these were identified as being 'main sites', at Aveiro, Berlin, Brussels, Madrid and Naples. The characteristics of a main site were that they had speakers, presenters and participants on site, including all relevant supporting facilities for full interaction during the Summer School, including a back up ISDN network. A further 13 (secondary) sites involved in the Summer School had varying degrees of support facilities, however most of them could support full interaction (Refer to Appendix 1 for a description of the sites involved).

An experimental network was used to support the Summer School which consisted of: ATM terrestrial trans-European links, provided by the ACTS project, JAMES, also satellite links and gateways to narrowband networks such as the Internet. The network supporting the ISABEL application was provided by the University Politecnico of Madrid.

2 Method for evaluation

2.1 Introduction

A four part methodology was adopted:

- structured interviews with speakers at the Brussels site,
- questionnaires administered to participants at four of the five main sites,
- experimenter observation at the Brussels site (with additional comments from an observer at the Madrid site),
- unstructured evaluative comments from various other attendees and speakers, both during and after the event.

Structured interviews were chosen in order to extract a high relevance of information from the speakers, and to be able to follow up further issues in required depth. These were all conducted by the experimenter. Questionnaires were used to get feedback from participants. This approach was taken due to the distributed nature of the event and the wish to get feedback from the different sites involved. These were administered by a different person identified at each site.

2.2 Sessions targeted for evaluation

Prior to ABC '96 eight sessions were selected, intended to represent the range of interaction styles across all sessions (refer to Appendix 2 for ABC '96 Programme). The different sessions were selected for potential analysis on the basis of the following criteria:

- Presentation type (the following types of session were planned for ABC '96: lecture, demo, video/talk, informal chat, debate, panel discussion).
- Estimated level of interactivity (depending on number of sites directly involved in the session, site of speaker, site of presenter, number of speakers involved)

The sessions selected for analysis were:

- 1. Individual presentations, speakers at Aveiro and Brussels, presenter at Aveiro
- 2. Individual linked presentations, 2 speakers at Madrid, 1 speaker at Naples, presenter at Naples
- 3. Lectures, 1 speaker at Madrid, 1 speaker at Aveiro, presenter at Aveiro
- 4. Debate, 3 speakers at Brussels, Madrid and Naples, presenter at Berlin
- 5. Linked lectures, 2 speakers at Brussels, presenter at Naples
- 6. Lecture, 1 speaker at Brussels, presenter at Brussels

- 7. Lecture, 1 speaker at Madrid, presenter at Aveiro
- 8. Lecture, 1 speaker at Naples, presenter at Naples

In the following report 'speaker' is defined as a person giving a presentation at the Summer School, 'presenter' is the co-ordination person based at each main site responsible for introducing the speakers, managing questions at their site, and certain chairing-type activities e.g. during discussion sessions. An additional responsibility on presenters was their role in the overall control structure. This aspect was supported from the main control site (Madrid) by a continuity presenter assisted by a content evaluator and commentator. In addition there was also a co-ordinator based at each site responsible for technical co-ordination of their site with the overall Summer School. 'Participants' are attendees to the Summer School.

2.3 Participant questionnaires

The participant questionnaire was administered after the eight targeted sessions by a member of the ABC '96 team based at each of four of the main sites: Brussels, Berlin, Madrid, and Aveiro. The style of questionnaire was intended to allow more detailed feedback to be sought where appropriate, by the use of follow-up questions (see Appendix 3).

2.4 Structured interviews with speakers

Structured interviews with the speakers were carried out after the targeted sessions. All of these interviews were carried out at the Brussels site. This approach was chosen because of it's flexibility to ask speakers about particular events that may have occurred during the session. The interview included the following issues: background of speaker, interaction issues, perceived quality of network, and educational aspects (see Appendix 4).

2.5 Experimenter observation

An experimenter, based at Brussels made observations based on a checklist of points during every session at the Summer School. The checklist (see Appendix 5) aimed to extract the following type of information:

- 1. Nature of technical problems that occurred during each session,
- 2. Extent of any disruptions,
- 3. Quality and reliability of communications link,
- 4. Appropriateness of the Isabelle application,
- 5. Presentation issues,
- 6. Interaction issues,
- 7. Co-ordination between speakers, presenters, organisers, and participants.

In addition an observer based at Madrid continuously logged technical problems that occurred at the Madrid site (see Appendix 7). Note that some of these problems may have been caused by equipment particular to the local site, not necessarily by the overall network, application, organisation or other sites involved in the interaction.

3 Results

The following section is organised by issues, identified as being important during the analysis of the material. Results from the four parts of the evaluation provided input into each section. Where it is considered useful to highlight a particular issue or idea, quotes from respondents to the questionnaire, or from speakers during the structured interviews are given (refer to Appendix 6 for the entire set of responses). Where appropriate, to back up responses to certain questions raised in the participant questionnaire, the percentages of respondents are given. These percentage figures refer to the proportion of respondents who answered that particular question, the number of respondents answering the question is also given, e.g. (n=38).

3.1 Background information

The majority of participants were students at the local sites. Some participants, particularly at the Brussels main site were employees, engaged in the telecommunications or IT field.

A total of 50 participants completed the questionnaire for participants during the four days at Brussels (n=3), Madrid (n=22), Aveiro (n=13), and Berlin (n=12). In addition to this several informal interviews were made at the Brussels site with participants.

Number of days spent attending the Summer School	Number of respondents
1	2
2	4
3	7
4	36

Table 1- Number of days respondents attended ABC '96

The majority of participants (72%) interviewed were present at the Summer School for the entire duration, (most of this population comprised students from Madrid, Aveiro and Berlin)

Most respondents (58%) had some form of experience of videoconferencing prior to attending ABC '96. Their experience ranged from having seen M-bone, but not personally used it, having taken ISDN videoconferencing courses and having used it regularly as a part of work, or having had it installed at home on a PC. Only two respondents had attended previous Summer Schools (one in 1994 and one for the two previous years).

Five speakers were interviewed after having made presentations at the Brussels site. Note that in the initial targeted 8 sessions, only 4 of these included speakers based at Brussels. A speaker from an additional session was also interviewed.

3.2 Technology Infrastructure

3.2.1 Audio and Video problems

There were continuing problems with audio. When the quality was very low it was difficult to understand speakers.

Some problems were experienced receiving audio when switching occurred between sites (e.g. during question sessions when the sites asking a question changed). Audio didn't start up immediately. The instruction was, 'count to five when the video image appears, then start speaking'. However, in many cases this procedure was not followed in full and the audience missed the first half of the initial sentence of a question or response. With current technology this problem could in future be alleviated by insisting that procedures are followed.

At the beginning of the week there seemed to be continual problems receiving video at the Brussels main site in the afternoons. This was apparently due to the Brussels connection which was routed through the Paris JAMES node, which disrupted video transmission.

3.2.2 Disruptions in presentations

Several speaker's presentations were disrupted, either before or during their session by technical problems. Some of the problems were:

Rebooting of the local equipment whilst the speaker was supposed to be in session.

Loss of audio transmitted to other sites, subsequent interruption by continuity presenter in Madrid and confusion over whether to continue presentation to local site or to stop.

Requirement to load slides into local server just before the speakers session commenced. This took time and cut into speakers allocated session.

Some speakers found that they were having to cut down the length of their presentations, quite dramatically in certain cases. This led to varying degrees of disruption depending on the individual speaker, knowledge of their presentation and slides etc. Some speakers managed to smoothly reduce the length of their talk, but others found it difficult to suddenly adapt their presentation due to changing time demands. In future events it may be necessary to instruct

speakers to be more flexible and be prepared in certain situations to cut the length of their presentations.

Speaker preparation was generally inadequate due to a number of factors. One major problem was the obvious lack of rehearsal time. However, in the main this was due to inadequate appreciation by speakers of the nature of the environment (e.g. the application functionality, the TV cameras and lights etc.). The use of interactive distributed videoconferencing places additional responsibilities on speakers to best fit their contributions to the new media, as well as to explore, creatively the opportunities offered by the new technology.

The following two questions, included in the participant questionnaire (see Appendix 3) related to technical infrastructure.

"Did you feel that the quality of network link was sufficient to be able to answer questions from the floor? If no, what were the problems?"

Thirty-eight percent of the respondents replied categorically that the network quality was sufficient for this application (Respondents answering question, n=39). A further group (10%) responded that it was 'more or less' sufficient. Several respondents (28%) thought that in general it was OK but had problems, or could be improved in some aspect. Most of the reasons cited were technical problems (insufficient bandwidth, delay in receiving audio or video, insufficient end equipment particular to each site, and the presence of echo), a few respondents would have preferred higher quality in general.

The following problems were highlighted by respondents in comments, such as:

"In general yes, but no short discussion possible. Especially, it is not possible to ask questions during a lecture."

"Yes, more or less, perhaps it needs more experience."

"Better quality would be desirable."

"Yes, the quality was enough, but the users had to go through a progressive learning period in the usage of these technologies."

"Yes, aside from the problems of simultaneous access to two sites."

"OK, but technical problems interrupt the continuity of the conference, because each time they happen you lose your concentration."

"Most of the time, it was. The rest of the time I believe that a peak of 6 Mbit/s is not enough."

Only thirteen percent of respondents replied that the quality of network was not sufficient for this type of application, without qualification. One of these respondents perceived a problem at the level of interactivity between speaker and participants:

"There have been some problems with the network link. I don't think that the quality of physical links has been sufficient to enable the successful answering of questions from the floor."

"In your opinion, is the medium of Broadband communications rich/ appropriate, powerful enough to support this type of event?"

Several respondents (56%) replied very positively that broadband communications were rich enough to support this type of event (Respondents answering question, n=36). One respondent made the following comment about relative benefit:

"Yes, and I noticed the advantages, for instance money saving on travel, surpass it's disadvantages."

Many further respondents (28%) replied that in general the media was rich enough, but that it was conditional on several issues. Several reasons related to the need to resolve technical problems; to improving picture quality, using more of the broadband, better implementation, better synchronisation of audio and video, and better error-correcting algorithms.

Three respondents made interesting comments:

"Yes, although some problems should be solved, but I believe it will be of extreme importance in the not too distant future."

"Yes, as long as the medium is novel and deeply related with the content of presentations."

"Has a future, there is room for development, the merit is that it brings lots of people together, concept is good, just a matter of using it now."

Only a small proportion of respondents (14%) thought that the medium was not rich and powerful enough to support this type of event.

3.3 Users viewpoint

3.3.1 Clarity of audio

Forty-seven percent of respondents stated that the audio during the Summer School was understandable (Respondents answering question, n=43). Many respondents (44%) noted that in general it was understandable, but that they had certain problems; comprehension depended on the site involved (audio originating from the Naples site was very poor), at certain points there were complete cuts in audio, and the audio was difficult to understand at some points. A confounding factor was however present: some speakers did not speak English as their mother tongue, making it more difficult for participants to understand (the majority of whom also didn't

speak English as a mother tongue). Only nine percent of respondents replied that the audio wasn't understandable.

3.3.2 Problems experienced with audio and video

The most common problems experienced with the audio and video were echo (39%), lack of synchronisation between audio and video (16%) (Respondents answering question, n=38); one respondent from the Brussels site couldn't understand why the audio and video were synchronised during certain points in the Summer School, and not during other times. Other problems that respondents had were: volume level (24%), interruptions or cuts in the transmission of audio (13%), feedback (5%) and low frame rate of video (3%). Refer to Appendix 7 for a full breakdown of technical problems that occurred at the Madrid site.

The majority of respondents considered the video to be appropriate (85%), although a small number thought that the image size of the speakers and presenters was too small and the general quality low.

3.3.3 Expectations of video quality

The majority of respondents had expected the video output to be of better quality, in terms of higher frame rates and resolution. Many respondents had quite high expectations based on the knowledge that the Summer School was supported by ATM networks. Several respondents mentioned that they had based their expectations upon TV quality images. This is an important observation which supports the view of the organisers for the use of broadcast standards. Other respondents had based their expectations upon previous experience of ISDN videoconferencing, and had expected ATM networks to deliver higher quality audio and video.

"Was expecting more quality in terms of video because of the promises of ATM technology"

"Based on ISDN connectivity, it was approximately the same"

"(Expected) better synchronisation between video and sound and a better frame rate"

3.3.4 Presentation medium

All of the speakers were asked prior to the Summer School to provide slides in Powerpoint format, and most of the presentations given were based heavily around content provided by these slides. Only one speaker extended the possibility of multi-media distributed conferencing and presented pre-recorded video to highlight an example in a case study. Some respondents were disappointed by the presentation medium used. After listening to the session where pre-recorded video was used to supplement the presentation, one respondent suggested:

"A lot of people are only convinced if they see real examples, these are good, need more of these"

Another respondent commented that,

"There was a lack of animation, (I) would suggest the use of authorware, like Macromind Director"

3.3.5 Presentation

There was a lack of conformity in some presentations to basic human factors issues of presenting slides, such as avoiding information overload, ensuring that typefaces are adequately clear and large enough to read from the distances involved, and the sensible use of combining colours in a slide. Respondents commented:

"Slides were appropriate, but sometimes the text was too small"

"I guess some lecturers didn't know the basic procedures for putting information onto transparency, and they put too much information down."

3.3.6 Screen layout

The layout of the screen was generally perceived to be quite good. A few comments were made concerning the size of video images of speakers, number of images on screen at same time, and the nature of the split screen (between slides and video). On the screen layout respondents commented:

"Well planned, but the transitions were cumbersome (e.g., the windows kept changing size consecutively for several times until they matched the desirable size"

"If there are 3/4 parties (involved in discourse), it might be interesting to see all of them, but if there are more sites it would be too easy to overload it"

Current human factors research strongly favours a maximum of two images as this gives the best opportunity for people to concentrate on what is being said. With current technology, the detail attainable in windows is unreadable with more than two images.

3.3.7 Level of involvement

Respondents were asked,

"Did you feel that you were part of the whole Summer School 'event' (e.g. that there were 20 sites), or simply part of the local audience?."

There were mixed reactions about the level of involvement respondents felt during the Summer School (n=40). Forty-three percent of the respondents felt part of whole summer school, 25% percent of respondents felt part of local audience, however a large proportion (30%) of respondents felt neither unconditionally part of the Summer School, or just part of a local audience, feeling to some extent part of the whole summer school, but only at certain points. Comments from respondents included:

"Yes and no. Yes I felt that there were other sites involved, but not 20 other sites"

"I felt mostly part of the local site, although I'm aware of the other sites all over the world"

"(I) only feel part of the whole event when the lecture and actuations were dynamic" "Sometimes felt involved in whole event, especially when there were lots of windows on the screen"

"(I) didn't feel fully involved in the whole event, since you lose some human contact between students and lecturers"

"Yes, mostly because of the language and the atmosphere"

"While the presentation techniques do not evolve, following this new technological environments, the integration of everyone in the global whole will be quite difficult"

"I really enjoyed feeling part of a distributed audience"

"The presenter always talks to the camera, leaving the audience a little distant. Doesn't allow proximity"

"There was nothing indicating that other sites were involved, except when other questions were raised"

Two experiments were carried out during the Summer School, a 'distributed Mexican wave', and a 'distributed poster'. In the former experiment, eight video images were arranged in a circle around the video screen and participants and/or presenters emulated a 'Mexican Wave' by standing up in order, this involved the following sites: Ottawa, Linz, Aveiro, Brussels, Berlin, Groningen, Rejkiavik, Stockholm. In the 'distributed poster' experiment, each site was given a single letter to draw on a large piece of white card. The letters were held up to the camera by the sites and the videos of the individual sites were arranged on screen to spell out, "ABC '96 OK!". These 'experiments' probably contributed in large part to people's feeling of involvement in the Summer School:

"Most of the time I felt part of 2-3 sites, very few times I felt part of more, ...I only felt really part of the whole audience during some of the 'social type' interactions, namely the Mexican wave"

3.3.8 Handling technical problems

At various points during the Summer School, technical problems inevitably occurred; transmission links went down, audio and/or video was lost momentarily and then reconnected, and reboots were necessary a few times during the Summer School. Additional coffee breaks were introduced as a way of temporarily placating participants, this had the advantage of keeping participants occupied during the more serious system 'down time', gave participants more opportunity to discuss previous sessions, and gave participants time to rest between the demands of attending to the video screen. However the drawback was that there are only so many coffee breaks that could be introduced into the day. There were mixed reactions from respondents towards the way in which problems were dealt with during the Summer School:

"The organisers apologised, explained and offered coffee"

"There was confusion while the technical problems were happening"

"Yes, but they (the organisers) controlled the problem as fast as possible"

"Yes, they were dealt with in a reasonably competent manner, but the several cold reboots seemed quite unprofessional"

An important issue is to keep participants informed of what is going on when the event does not run to schedule. However this can be difficult when the organisers don't necessarily know what the problem is themselves, or how long it may take to re-instate the network link.

3.3.9 Prior expectations of the Summer School

Different participants came to the Summer School with different types of expectations. Some came to learn about the themes of the Summer School, the convergence of IT and Telecommunications, some participants came from one field hoping to learn something about the other field. Some participants came to learn about ATM and broadband technologies, and to see a demonstration of it over the network.

"My prior expectations were to get important, updated information about the market and technical situation of broadband communication and a real demonstration. Yes, these were fulfilled."

"It was what I expected (except for the delay of the image) and I wasn't at all impressed with the impact of long video conference sessions on big audiences. I think it is very important the lively interventions of local (i.e. real, or live) people" "Expected that after 4 years the technology should be more stable. Surprised at the low bandwidth being used."

"(I was expecting) bigger interactivity between participants and presenters, more information about a summer school and a videoconference without any long interruptions. It wasn't completely achieved."

3.4 Lectures/ presenters experiences

3.4.1 Training aspects

A leaflet was distributed to speakers prior to the Summer School, 'Guidelines for Speakers'. The guidelines included information about the theme of ABC '96, it's objectives, explanation about geographical distribution, discussion of themes to be covered during the Summer School, timetable and abstracts for each presentation.

Most of the speakers did not get a chance to practice on the Isabelle system before presenting at the Brussels main site. They were shown how to use the interface to change between slides, but some did not know how to control the telepointer, and whether it would be seen by all of the remote sites as well as at the local site. One presenter mentioned that additional practice beforehand would have helped to solve this problem, another presenter said that the set-up was straight forward enough to use without too much training. The organising committee had recommended that speakers arrive beforehand to get some practice with the equipment, but this was not adhered to, being very difficult due to time constraints on speakers etc.

3.4.2 Interaction

Speakers were asked about the extent to which they felt part of the ABC Summer School, whether they felt that they were talking to 20 different sites, or just the local site. They commented that lack of feedback during their presentation made it difficult for them to sense the presence of other sites, since there was no eye-contact of remote sites at this point. One speaker commented that ideally there would be a large monitor showing video of the other sites during the presentation. Interestingly a further speaker commented that he sensed being part of the ABC Summer School due to the technical problems that occurred. These made him more aware of the fact that the event was being run over a network, rather than simply at the local site.

In the briefing to speakers they were instructed to look at the camera during their presentation, in order to involve the remote sites in the session. One speaker noted that is was difficult knowing whether to focus on participants at the local site or at the camera; he felt a conflict between talking to the camera in order to involve remote sites and keeping the local audience involved. One possible solution to this problem could be to position the camera in the middle of the auditorium/conference room and to ask speakers to treat it as a participant. A further problem, he commented, was that there was a very strong light originating from the same source as the camera so he didn't like looking towards it all of the time. One presenter felt satisfied that he adequately involved both local and remote sites:

"(I) was well aware of being in conference with other sites and it did modify my behaviour- shared eye-time with local group as well as the camera.

3.4.3 Question time

There was agreement amongst the group of speakers interviewed about the lack of feedback during the time allocated for questions from participants. Two speakers felt quite strongly that they lacked video feedback of the person asking the question. There were two video images on screen at any one time. The general sequence during question time was: presenter and speaker, presenter and questioner, presenter and speaker (in response to the question). However this sequence did not allow for interaction between the speaker and questioner; the speakers commented that they wanted to see the video of the questioner whilst answering their question, to try to gain an idea through clues such as head nodding etc. to see how they reacted to the answer. This also led to further difficulties in the interaction due to the requirement to switch between sites more often. This invariably incurred a loss of audio for several seconds at the beginning of each phrase after switching to a new site, and poor initial comprehension of both question and answer.

One speaker had expected that the question time would last half an hour after a debate session which involved two other speakers as well as himself. However, due to delays before and during the session there was only enough time for 10 minutes of questions altogether, and only time for the speaker to answer one question. The speaker was unsure if he could have followed up on an answer given by another speaker during the debate and the mechanism for doing so. He commented that there should have been more discussion and interaction between the speakers involved in the debate. Another speaker noted:

"I certainly don't feel that all of the other sites were adequately involved in the event. The constant technical glitches were a great distraction. Obviously the technical team needs to work on this. The delay to download slides and reboot was ridiculous. There were some control problems handing over between sites, and there was never a feeling that more than two sites at a time were involved in any particular conversation."

The management of question periods with both a large distributed audience and a set of distributed lecturers, under the control of a presenter introduces many management issues to organisers of such events. In a routine scenario with just one lecturer who occupies a fixed time

slot, the problem is more tractable. Events such as ABC '96 require trade-off's between the exercise of management control in a distributed environment, against user control in a more rigid activity. One solution may be to always have lecturer/ presenter in the same location if they are not the same person.

3.4.4 Interface issues

A standard point and click mouse interface was used for the control of slides. At the Brussels site the mouse and mouse mat rested on the podium at waist height and a PC showing the local site view was mounted on a table to the side of the podium, allowing speakers to control the interface. One of the speakers noted that it was difficult to see the local monitor due to this positioning to one side. He found it difficult to look at the camera, and to keep an eye on the content of his slides, so he did most of the talk from memory. As a consequence of this local set-up it was also quite difficult to control the mouse since it was on a sloping surface; some of the speakers noted that every time they let go of the mouse it slipped down the screen, so that it wasn't possible to keep it 'hovering' over the next page icon. This local site set-up was not however recommended by the organising committee who had recommended that presenters were seated behind a table facing the participants with a local monitor and mouse to the side.

The control icons on screen were quite small, and with the added difficulty of hand shake, controlling the interface proved to be a little awkward for some speakers. One speaker wasn't sure whether or not the cursor acted as a telepointer, viewable to the remote sites. One speaker wanted to draw a line on a slide but wasn't sure know how to do this.

A particular difficulty experienced by speakers during the Summer School, as a side effect of technical/ network problems, was the need to reduce their presentation time at short notice (either directly before, or during the presentation). The requirement was to skip pre-prepared and ordered slides- something that would be relatively straight forward with manual OHP sheets, however the Isabelle interface only allowed the facility to show one slide at a time, and unless the speaker knew the exact order and numbers of slides, the flow of the presentation was interrupted.

3.4.5 Best things

Speakers were asked,

'What were the best things about giving your presentation in this manner (compared to a traditional conference)?''

'Distribution' was clearly the most favoured aspect of the Summer School:

"Distribution gave strong sense of community"

"Communicating to all over Europe- distributed nature of event"

- "Nice challenge being involved in 14 countries- marvellous."
- "Reaching many sites without getting on an aeroplane."

3.4.6 Worst things

Speakers were also asked,

''What were the worst things about giving your presentation in this manner (compared to a traditional conference)?''

"Not having done presentations in this format before, not having been involved in the Summer School organisation, unsure what context (I) was asked to speak in."

"Breaks in audio link, needs to be improved especially for question time."

"Someone can 'pop-up' from any site and you're not quite sure where they are- needs clearer labelling."

"Not enough question time. A question was put to another speaker that he answered, and I wanted to expand on- no opportunity to do this. If there is a panel, I would like to see this as a proper panel discussion, therefore I would like to see more interaction between speakers. It actually came across as 3 separate speakers. All 3 panel members should have the opportunity to jump in and comment at any point."

"Disjointed technology and interruptions."

An increase in the stability of the technical aspects- networks, applications and organisation would inevitably help overcome some problems. Also a clearer policy during question time, e.g. preventing delays (that were not a direct result of the speakers presentation), 'eating up' question time.

3.4.7 Technical

Speakers were asked about problems of a technical nature that they may have experienced during their presentation. The general feeling was that they had expected higher quality links and a more stable infrastructure.

"Had to strain to hear audio at some points"

"Audio was very quiet."

"Quality of network was fair at best. Complete inattention to synchrony between audio and video made the use of the video nearly worthless. Audio quality varied greatly, from very poor to excellent. Constraints were obvious: inability to view multiple sites simultaneously."

"Expected that after 4 years that the technology should be more stable. Surprised at the low bandwidth being used."

3.4.8 Timing issues

One speaker commented that he would have liked an on-screen clock, on his local monitor only, to indicate how many minutes he had left until the end of his presentation. In some sessions there was added time pressure on speakers due to preceding technical problems and they had the additional pressure of shortening planned presentations. Some presenters kept looking at their watches to keep track of the time remaining which was a bit distracting to the audience. One speaker compared the different pressures of the distributed Summer School to a traditional event:

"Normally rely on chair to be sensible with timings of each slot, but here we have very fixed slots with not much flexibility, procedures need to be built up."

3.5 Participation and Interaction

In general the time allowed for questions was adequate for the number of questions participants requested to ask. However at the end of some sessions there was a relatively low level of interaction because there wasn't enough time left in the session to ask more than one question. Ideally, for a distributed Summer School such as this there needed to be more time for question and answer sessions. After some of the interesting and popular sessions several sites indicated an intention to ask a question, but the presenter did not have enough time to adequately allow all of the sites to participate in the question and answer sessions.

Video of the questioner did not appear on screen after they had asked their question, the 'focus' went back to speaker and presenter, whilst the speaker was answering the question. Consequently the audience received no feedback on whether or not the question was being answered, i.e. the audience (or speaker) could not watch for facial expressions, to see if he was satisfied with the answer.

In addition, during the question and answer sessions, the presenter didn't go back to the questioner after his question had been answered. In conventional conferences the questioner is often asked if his question has been adequately answered. In some cases they were asked and this worked well, although it took up more time, and gave less opportunity for other sites to ask questions. There is clearly a trade-off; distribution adds participants exponentially, but this in turn reduces a given individual's allocation of time for direct participation.

In some cases the questioner and speaker together on screen didn't make eye contact with

camera (speaker was looking at local monitor and questioner looking at his paper in front of him/ elsewhere). This reduced the likely level of involvement felt by remote sites.

There was no clapping after sessions (even where the speaker was local) at the Brussels main site. Clapping only occurred during entertaining moments, e.g. after Mexican Wave, and when presenters requested that participants clap a speaker. At the Madrid site some of the local speakers were clapped. This is an interesting social issue that warrants further research.

3.6 Presentation aspects

Not all of the speakers used presentation guidelines to write their slides (e.g. see 3.3.5). There is a requirement to incorporate strict guidelines for presenters next year. One of the presenters commented that the prerequisites for distributed events are fundamentally different:

"...it is harder to grab audiences, and this demands a larger effort in presentation techniques and more imagination in order to obtain more dynamic presentations"

Generally the local video showing the speaker was quite small for the main part of the talk, with the slides given prominent screen position. This worked well, especially because the local monitor was expanded on the screen at the beginning of talk for first 20/30 seconds, then reduced in window size for the most part of the talk. Only on a few occasions did the local monitor cover slides. During some presentations when technical staff knew that the end of presentation was coming up they enlarged the video of the speaker to full screen, this was successful, and follows broadcast standards.

3.7 Context of results

There were some limitations to the study; the structured interviews with speakers were all carried out with speakers based at the Brussels site due to constraints of time and budget. Therefore the results are to some extent dependent upon the end equipment, set-up and organisation at that site, and not fully representative of the speakers experiences across all sites during the Summer School.

The feedback from participants is equally a reflection on the make-up of the sample group, most of whom were students from Madrid, Aveiro and Berlin, with some participants from Brussels. Certain responses in the participants questionnaire were dependent upon end-equipment and the set-up at individual sites, such as perceptions of the quality of the audio and video, particular technical problems experienced during the Summer School, and the degree to which they felt they were involved in the entire Summer School. An analysis was not carried out on the technical equipment installed at each site as it was deemed outside of the scope of this study.

4 Conclusions and future requirements

4.1 Video

The quality of the video pictures was generally perceived as acceptable.

The variations in quality observed can be ascribed to a number of technical issues. These include the bandwidth of the connections (dragging of images, or ghosting), ATM cell loss (random pixel loss), and the image processing load on the workstations, particularly the Parallax video cards (slow speed of initial site linking). New video standards (such a MPEG) will have a major impact on this latter problem.

4.2 Sound

The sound quality, although generally acceptable and noticeably better than in previous events, remains a recurring issue. Problems included echo, feedback, breaking up of the sound stream, and possible poor quality audio equipment at some sites (including poor volume level). Balancing the sound streams from the various sites was also a major problem, with some sites noticeably difficult to hear at times. In addition, synchronisation between audio and video was at times poor, and varied depending on the network status.

Although priority was given to transmission of the sound, there were numerous instances of sound degradation due to the video processing load. The audio is a critical part of the system. Although it is possible to 'get by' without video, it is not generally possible to continue without audio.

4.3 Network connections

The network on the whole was fairly reliable during the week, there were however two instances where failure of the network caused serious problems. In one instance all communications failed between Portugal and Spain for a whole afternoon, this caused serious problems as one of the lectures was based in Portugal and the programme consequently had to be rescheduled. Another serious problem was the ATM connections overheating in the afternoon caused network problems for those who entered the network via Paris.

4.4 System Stability

Instabilities in the system soon spread around the system and therefore there was a constant need for regular rebooting of all of the workstations at each of the sites. An attempt was made to do this during the breaks but at times it resulted in delays to the scheduled activities of up to 20 minutes.

4.5 Interactivity

There was generally agreement that the level of interactivity was very much enhanced over previous events. This allowed greatly enhanced intersite interaction, both between the site presenters and speakers, and between the audience and the presenters and speakers.

Multi-site activities included a session with the presenter and four speakers all at different sites engaged in a 'round table' discussion amongst themselves and the audience. This discussion would have greatly benefited from increased interaction time, and a clearer understanding of the system (by speakers) to increase interaction between speakers. The reaction of the audience was positive, and the feeling was that this type of session could contribute enormously to the perception of 'one' event.

There is a requirement in distributed interactive events such as ABC '96 to extend presentations beyond what has become standard in conference presentations; possibilities for producing multimedia presentations should be explored further.

Both participants and speakers may have to learn to slightly adjust their behaviour when using this technology for this purpose. For example, rapid interaction at question time is not going to be possible, speakers and participants have to be briefed about this and perhaps be more patient. More time needs to be allocated to question and answer sessions.

This increased interactivity was largely due to the different approach adopted by the organisers, and to the use of the presentation team and real time co-ordinator or producer (i.e. the importation of broadcast standards into the whole event). The use of a continuity presenter, located at the main site, was a new innovation which helped to control the on-screen activities, as well as a means to cover any technical failures.

4.6 Sessions and speakers

The standard of the lectures was excellent. The Summer School covered the full scope of the convergence of computing and telecommunications in some detail. The speakers were very knowledgeable and co-operated with the new presentation mode.

It was noticeable, however, than many of the speakers were insufficiently aware of the real impact of the distribution elements. Only in a few cases were speakers prepared to depart from the standard conference presentation mode. For example, in one session, the speaker and one of the presenters began by engaging in what initially seemed to be casual conversation while seated in the audience. The participants reacted particularly well when presenters and speakers used the distributed nature of the event to the full.

The lecture content was supported through the presentation team by having a knowledgeable expert introduce and comment on the important elements in the speakers presentations at the beginning and end of each session. This was achieved through an explanatory dialogue with the continuity presenter. As a result, participants were better prepared for each session, and the key points were underlined for them at the end. There was much favourable comment on this aspect.

It is much harder for speakers to see whether or not the distributed audience are attentive, and whether they have understood what the presenter is presenting, in this particular set-up. This was the primary reason for basing speakers only at the main sites, in order that they may get some feedback from the local audience. The issue of involving both local audience and remote sites however has not been fully resolved.

4.7 Slides

The distributed white board worked extremely well in general, although some of the interface aspects could be improved from the speakers point of view. Most speakers found it a little difficult to move forward or backward through their material at will, which was necessary at certain points during the Summer School, e.g. when time pressures led to reduced session time. One speaker integrated video clips with his slides, and this worked extremely well and was well received by the participants.

Some of the speakers were more expert in slide preparation than others. Most of the time, the speaker was seen in a small window top right of the screen. This sometimes partially covered the slide material.

4.8 Camera work

The camera work was overall very acceptable. Some sites made a special effort to present people on screen in more natural locations, i.e. seated beside a table with a 'clean' background rather than standing against a wall or in front of a display board. The general perception was that the more informal settings improved the ability of the participants to concentrate. The more 'severe' images lacked depth and definition which made it difficult to focus the attention for lengthy periods.

4.9 Screen display

This was perceived as a major improvement. For most of the time, the screen showed a single or at most two windows. It was clear who was speaking to whom, and it was easy to follow the dialogue. The windows contained a good variety of images, from a single person or two, to a panel or to the whole audience (for one of two of the demonstrations). The windows were of fixed size, and were retained in the same locations on screen. This produced a more professional quality, and resulted from the approach of the organisers to the importation of broadcast standards into the presentation and management of interactive distributed educational events.

4.10 Control and management

It was obvious that the successes achieved were in large part due to the approach adopted by the organisers in setting broadcast standards for production, presentation and control. This was especially evident from the on-screen use of presenters to control the sessions, and to increase the level of intersite interactivity. The rapid reaction of the team to the challenges of presenting over 25 hours of live interactive educational activities, using the broadcast style and standards was especially successful. From the viewpoint of the participants, it is this major step forward in production values which will be the benchmark for all future events of this nature.

4.11 Concluding remarks

It is necessary to be more flexible when involved in a distributed interactive event such as this; sessions get delayed, technical problems arise and the demand on the organisational team is much increased. Speakers need to be adequately prepared and aware of ways in which to deal with changing circumstances, and participants need to be kept informed of changes in the event, such as delays to sessions.

This type of Summer School has the potential to be an effective medium for delivering educational material; it brings together speakers and audiences that otherwise wouldn't be able to participate in a similar event at the same time. In order to support university teaching, distributed learning has to be carefully planned, it is necessary to look at the value added to the process (e.g. having lecturers that students wouldn't otherwise have access to), and to consider how services could be used to augment educational content.

At the end of ABC '96 sites were asked for their opinion on the value that this type of event had to education. The Ottawa feedback considered ABC as 'information exchange', rather than educational. Aveiro thought that it was a good result in terms of educational content. Participants at Berlin were sceptical about the distributed lecture approach before the event, but afterwards changed their opinion and now consider that it "offers new and increased possibilities" to providing education.

5. Recommendations

From the detailed evaluation described in this report, and the conclusions in Section 4, recommendations on the use of distributed interactive videoconferencing in higher education can be drawn.

5.1 Status of the technology

The technology to deliver distributed interactive educational events is now at a stage of development such that its routine application can be considered. **The issue of standards needs to be addressed**, to avoid widespread interoperability issues. In addition, recommendations on appropriate standards for the various technology components would assist and accelerate deployment on a wider scale.

5.2 Primacy of educational goals

Delivering educational value, through the use of this technology can be achieved, and offers huge potential for creative use to serve educational purposes. There are however problems in ensuring that appropriate educational goals can be achieved. As the quote at the beginning of this report states, **there needs to be a clear focus on how the technology serves the educational purposes of such activities**

5.3 Presentation and production values

Technical issues remain to be resolved so that this technology can be deployed regularly and on a routine basis in support of educational goals, and particularly in order to achieve the presentation and production values participants expect from their long exposure to broadcasting standards. Currently, **to achieve clear educational rather than technical goals requires a major focus on presentation and production standards**, and an enormous organisational effort both at the technical and educational levels.

5.4 Need for high levels of interactivity

There is a clear need, in order to maximise educational benefit, to maximise the level of interactivity. This must be carefully planned, and executed in a professional manner. Interactivity is the main perceived advantage of distributed videoconferencing over broadcast TV. There are major tradeoffs to be considered, as described above.

Further work is also needed on the most appropriate use of the technology for different types of interaction. For example, how many sites can be used, how many lectures can there be in a session, how much interaction is possible between lecturers and students, students and

students, and lecturers and lecturers? How can all this be supported with the current technology? Some type of matrix highlighting what can be achieved and with what level of technology would be of immense value in understanding what is feasible through routine deployment of videoconferencing technology.

5.5 Use of broadcast values

The integration of computing and telecommunications technologies is not sufficient in itself. To achieve educational objectives, there is an a priori requirement to integrate the technology domain with the educational domain. The use of broadcast standards for presentation and production values currently offers the best approach.

5.6 Organisational requirements

There needs to be further work to investigate the organisational requirements of higher education establishments in order to support similar types of events. These events need to be co-ordinated and managed in order to take account of all of the multi-disciplinary aspects. As indicated in earlier reports³⁴, videoconferencing in higher education establishments is currently approached from a number of different organisational sub groups, such as computer services, computer science, audio visual services, distance learning groups and others. There needs to be an advisory team set up to advise on the technical, production, presentation and educational quality aspects of undertaking distributed teaching events.

³Carter, C., Clarke, A., Graham, R., Pomfrett, S. (April 1996): *The use of Video Conferencing in Higher Education*. SIMA (Support Initiative for Multimedia Applications) Report Series (20), ISSN 1356-5370

⁴Butters, L., Clark, A., Hewson T., and Pomfrett, S. (September 1994): *The Do's and Don'ts of Video Conferencing in Higher Education*. SIMA (Support Initiative for Multimedia Applications) Report Series (4), ISSN 1356-5370

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APPENDIX 1- Site descriptions

Main sites

Brussels site

Large conference room, capacity of around 100 people, seated in straight rows at tables. Quite formal atmosphere, with long table, mounted on a stage facing audience. Speakers stood at a podium, to the right hand side and had a control of a mouse at podium for interaction with Isabelle system. A local monitor was situated directly on their right hand side at approximately waist height. Two wall-mounted speakers for audio output were on back wall. A control table with PC's and monitors was at left hand side of room, with one Isabelle operator and 'floor manager'. High fidelity recording and playback equipment was used; a camera was situated in a back room behind smoke glass, and a BarCo projector in another room.

Madrid site

Large auditorium with stage, capacity of about 200 audience in tiered seating. Speakers and presenters sat on chairs on the right hand side of the stage (Anne to complete)

Secondary sites

There was a range of secondary sites, ranging from the very small, with two or three participants in front of a PC to large sites in a conference room which could hold a couple of hundred people. All sites had the potential to be highly participative, having the facility to ask questions. The major difference between secondary sites was that they did not have speakers or presenters based at their site. There were 13 secondary sites, based at Austria, Brussels, Czech Republic, France, Greece, Iceland, Luxembourg, Madrid, Netherlands, Norway, Sweden, Switzerland and Canada.

EU site

Secondary site- therefore no speakers were based there, although there were facilities for questioners, with a video camera on tripod facing audience. Smaller room, in the Beaulieu 9 commission building; more informal atmosphere with participants coming and going at will. Seating for around 30 people. Lower fidelity BarCo projector.

Appendix 2 - Programme	A	pendix	2 -	Programme
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#	time	TITLE	SPEAKERS	presentation	venue	presenter	Questions from
Tues 9 July							
A0	0900	Welcome	Wim Delbare Michael Roy	informalchat	Brussels		
A1	0930	Introduction to ABC'96	John Dobson	video/talk	Madrid	JOHN	
A2	1000	Distributed Computing and Telecommunications	Peter Linnington (University of Kent)	lecture	Brussels	JOHN	Aveiro, Napoli, Berlin
	1100	COFFEE BREAK					
A3	1130	ATM Technologies - Promises and Disappointments	John Griffiths (Queen Mary & Westfield College) Therry van Langedam	complementary lectures	Berlin Brussels	ROBERT	Linz, Aveiro, Napoli, Madrid
	1230	LUNCH					
A4	1400	Future Visions of Telecommunications (Networks, Services and Markets)	Luc Le Beller (CNET) Cinzia Sternini (Telecom Italia) Thierry Bosseur (MFS)	individual presentations	Aveiro Naples Brussels	RUI	Madrid, Aveiro
	1530	COFFEE BREAK					
A5	1600	The NICEProject and the Summer School	Juan Quemada Pedro Chas Agostino Moncalvo	individual linked presentations	Madrid Madrid Naples	GIORGIO	KPN, Lintz, Aveiro, Napoli
A6	1730	Modelling in the SummerSchool	Mike Martin	presentation/demo	Berlin	JOHN	Napoli, Belgacom
A7	1800	Two presentations from Napoli	Agostino Moncaho, Cinzia Sternini	presentations	Napoli	GIORGIO	

#	time	TITLE	SPEAKERS	presentation	venue	presenter	Questions from
Wed 10 July							
B1	0900	Internet Engineering Task Force - Vision of the Future	Eric Huizer	lecture	Brussels	ROBERT	Geneva, Napoli, KPN, Aveiro, Berlin
B2	1000	What is Groupware?	Garth Shephard	lectures	Madrid	RUI	
	1100	COFFEE BREAK					
B3	1130	Object Wars,	Richard Soley Juan Carlos Llorente Giovanni Pirola	debate between standards and commercial world moderated by Mike	Brussels Madrid Naples	MIKE	Berlin
	1300	LUNCH					
B4	1430	Quality of Service	Fabio Panzieri Don Cochrane Anthony Oodan	panel discussion	Naples Aveiro Brussels	GIORGIO	Aveiro, Berlin, Madrid
	1600	COFFEE BREAK					
В5	1630	Multimedia on the Move	José Moura Amer Qay Yun	lectures	Aveiro Brussels	RUI	Napoli, Iceland
B6	1730	Multimedia Retrieval Services	Isidro Agualdo	linked lectures	Madrid	JUAN	
B7	1830	Presentation from Canada				JUAN	

#	time	TITLE	SPEAKERS	presentation	venue	presenter	Questions from
Thurs 11 July							
C1	0900	Optical Switching Technology - Status and Prospects	Paul Lagasse	lecture	Brussels	ROBERT	Brussels, Cern, Madrid, Napoli, Berlin
C2	1000	Mangement in a Complex Environment	Joe Chester	lecture	Madrid	JOHN	Brussels, ICPN, Madrid
	1100	COFFEE BREAK					
C3	1130	Charging by Value	Barrie Kerswell Albert Kuiper	linked lectures	Brussels Brussels	GIORGIO	Brussels, Berlin, Madrid, Barcelona
	1230	LUNCH					
C4	1400	Advanced Network Topologies and Access	Michael Griffin	lectures	Brussels	ROBERT	Ottawa
C5	1500	Service Interaction in Broadband communications	Hugo Velthuijsen	lecture	Brussels	GIORGIO	Ottawa, Napoli
	1530	COFFEE BREAK					
C6	1600	Tele - (Vision/Communication) - Is There Convergence?	Wulf Bauerfeld		Berlin	RUI	Ottawa
C7	1630	Challenges in the Design of Broadband Networks	Juha Heinanen	lecture	Madrid	RUI	

#	time	TITLE	SPEAKERS	presentation	venue	presenter	Questions from
Fri 12 July							
D1	0900	Summary: What Have We Learnt?	Bernie Cohen	discussion with John Dobson	Madrid	JOHN	
D2	1000	Future Regulatory Environments	Umberto deJulia		Naples	GIORGIO	Berlin, Iceland
	1100	COFFEE BREAK					
D3	1130	Site Visits	Bernie Cohen & John Dobson	Informal discussion	Naples	GIORGIO	Torino, CERN, Sweden, Norway, Ottawa, Linz, Aveiro, KPN, Holland, Berlin, CSELT, Napoli, Madrid
D4	1230	Closing Session	Wim Delbare	Summary	Brussels	JUAN	

APPENDIX 3- Participant questionnaire

Briefing notes:

- This questionnaire is designed to be administered by a member of the ABC Team (i.e. not handed out to delegates to fill in themselves).

- The questionnaire should be administered as soon as possible after the following sessions: A4, A5, B2, B3, C3, C4, C6, D2

After approaching delegate, ask "Were you present during all of the previous session?", if not obvious. If the delegate was present during the entire previous session then continue.

General

Session no. (A4, A5 etc.)

Name, position, company of delegate

How many days will you be attending the Summer School this year?

Why are you attending the Summer School?/What do you expect to get out of SS?

Have you had any previous experience of videoconferencing? /Have you attended any previous Summer Schools?

All the following questions relate to the PREVIOUS SESSION ONLY:

Audio/Visual aspects

Was the audio understandable?

Did you have any problems at any point during the session with the sound quality or level? (e.g. with feedback, echo, volume level)

Was the video appropriate for this particular presentation? If not why not?

Did you have any problems with video at any point during the session with the quality of the video?

What were you expecting, in terms of audio/video quality?

(If other presentation medium(s) were used during the session e.g. PowerPoint): Were they appropriate for this kind of lecture?

Screen layout

What did you think about the screen layout of the speaker(s), presenter, and questioner(s) (e.g. split screen between presenter & speaker)?

Interaction aspects

Did you have adequate opportunity to ask a question, when you requested? If not why not?

What did they think about presenter/speaker interaction?

(If relevant to session): What did you think about speaker-questioner interaction?

Need to find out about effect of having the speaker(s)/presenter(s) at different locations

Involvement

Did you feel that you were part of the whole Summer School 'event' (e.g. that there were 20 sites, or simply part of the local audience?

Did you ask any questions? How did you feel these were handled?

Differences between traditional & B/band comms.

What were the best things about the way in which the presentation(s) was given in this session (compared to a traditional conference)?

What were the worst things about the way in which the presentation(s) was given in this session (compared to a traditional conference)?

Did you feel that the quality of network link was sufficient to be able to answer questions from the floor? If no, what were the problems?

(Were there any problems of a technical nature during session?) If yes, ask delegate about these problems, and how well they felt they were dealt with by presenters/ speakers/ organisers.

Did you feel that the event was constrained by the technology in any way?

General questions relating to whole of Summer School

What were your prior expectations of the Summer School? Were these fulfilled?

In your opinion, is the medium of Broadband communications rich/ appropriate, powerful enough to support this type of event?

Are there any other comments that you would like to make about the ABC Summer School?

APPENDIX 4- Structured interviews with speakers

(To be done as soon as possible after the speaker's session)

Name of speaker, and session no .:

Background

Do you have any previous experience of participation at similar events (e.g. past Summer Schools, Videoconferencing etc.)?

Did you practice over the network beforehand?

Follow-up: If yes/no, Did you think this helped/hindered the quality of your presentation? Would you have done anything differently?

Interaction issues

Did you feel that you were part of the whole Summer School 'event' (e.g. that you were talking to the 20 sites, or simply to the local audience? Did this influence your presentation, or modify your behaviour in giving the presentation?

What did you feel about the interaction between you and the presenter/speaker? Could it have been improved in any way?

Did you feel that the other sites were adequately involved in the event?

Did you have any problems of a control nature (e.g. problems during hand-overs from presenter etc.)? Please explain.

Quality of network

Was the quality of network link sufficient to be able to answer questions from the floor? If no, what were the problems?

Did you have any problems of a technical nature? Please explain.

Did you feel constrained by the technology in any way?

Educational aspects

Did you think that the Summer School was an appropriate medium in which to give this particular lecture? How could this be improved?

What were the best things about giving your presentation in this manner (compared to a traditional conference)?

What were the worst things about giving your presentation in this manner (compared to a traditional conference)?

Summary questions

Would you do anything differently next year, in the light of your experience at this Summer School?

Any other comments/things to add?

APPENDIX 5- Experimenter checklist of issues

NB. Juan, Madrid to log the following (if technically possible):

-What site(s) the questions came from e.g. Naples, Berlin (including secondary sites), in each session.

-Technical problems. e.g. When did they occur, how long did they last, which site(s) went down, what was the nature of the problem, what kind of disturbance, if any was there at other sites, did both audio and visual break-down?

-Quality of audio/visual links? e.g. frame rates of video. Is there anything other measures that we could take to quantify the quality of the audio/visual during the conference sessions?

The following to be done, by session (NB: by designated sessions only, or every session? Probably every session?)

Details of any technical problems that occurred during session, e.g. network failure, breakdown in audio/visual.

What was nature of problem? How long did it last? Which sites were affected (if known)? What happened during network failure? What did presenter at (Brussels only?) do to address problem? How disruptive was the interruption(s)?

Quality of comms. link

Notes about audio, legible?, volume levels acceptable?, any feedback?, echo? (only for Brussels site)

Notes about video, quality acceptable?, frame rates acceptable? Any disruptions?

Application (Isabelle)

How well did it work? Ask organisers, floor managers, operators what they felt about it, what problems they had with it, how appropriate was it for this type of event, adequate training given? etc.

Could carry out a brief expert evaluation if time, and access to system.

Presentation

Type of screen display adopted during session (although this will prob. be the same in most sessions e.g. 2 windows with presenter & lecturer). Was anything other than standard layout used?

Presentation material. What material was used?, when in presentation?, how, legible for all of audience?

Did this session use the facilities appropriately?

Interaction issues

Co-ordination (between floor manager, presenter, speaker). What type of interaction took place?, how did control pass between etc.

Were there any problems of a control nature (e.g. problems during hand-overs from presenter etc.)? What was nature of the problem? Which sites were involved? How disruptive was the control problem?

What was planned level of interactivity? (AMC also to look at this, if time) How much interactivity was there? (AMC also to look at this, if time) Who was involved in questions at end of session?, which site etc. Were questions understood by speaker? Were there any difficulties during the questioning?

APPENDIX 6- Untreated data from participant questionnaires

Was the audio understandable?

Yes (Berlin) (Berlin) (Berlin) (Berlin) (B4, Berlin) (C4, Madrid) (B2, Madrid) (B2, Madrid) (A4, Madrid) (A4, Madrid) (Aveiro) (C1, Aveiro) (B2, Aveiro) (B2, Madrid) (B4, Aveiro) (B4, Aveiro) (B4, Aveiro) (B2, Aveiro) No (A5, Madrid) (A4, Aveiro) Mostly, with occasional breakdowns (B4, Berlin) At times it was very good, and at other times just OK (B4, Berlin) Partially, most of the time (B4, Berlin) Yes-mostly (Berlin) (B2, Aveiro) During the lectures-no, with the exception of the beginning and end of lectures (Berlin) Sometimes, yes, but sometimes it was not understandable (B4, Berlin) Depends on the sites involved (C5, Madrid) Not really (C4, Madrid) Depends on the individual site (C4, Madrid) Improving with the event, with the exception of Napoli (C4, Madrid) Yes, because it was here in Madrid (B2, Madrid) There were a few cuts, but in general it was OK (B2, Madrid) It was intelligible (A4, Madrid) Sometimes it was hard to understand (A4, Madrid) Generally, yes (A5, Madrid) In general, yes; it only failed on one occasion (A5, Madrid) Good in general (B4, Madrid) (B4, Aveiro) Yes, most of the time at least (B4, Aveiro) Most of the time, yes, but required considerable effort on my part (B4, Aveiro) Sometimes it was difficult, interrupted at certain points (A4, Belgacom) Had more problems with this session than other sessions, could have been due to 'Spanish' English (A5, Belgacom) Sound and images were good; good synchronisation (B2, Belgacom)

Problems experienced with audio/video

Mostly audio was understandable, although parts from Madrid were hard to understand due to feedback and echo. Video was appropriate, but not impressive (C7, Berlin) Synchronisation between audio and video could have been better sometimes (Berlin) Video and audio did not seem to be in synchronisation. Sometimes the audio quality was bad due to the loss of audio packets (especially from Naples) (Berlin) There were interruptions in audio transmission, but in general it was OK (Berlin) Occasionally the frame is quite low, otherwise it's OK (B4, Berlin) The question and answer sessions were not really understandable (B4, Berlin) The audio was not perfect (B4, Berlin) Audio-video co-ordination is not good. There were too few frames per second; I think it would be better for human perception if there was some trade-off between frame-rate, resolution and colours (B4, Berlin) Problems with echo. Lack of synchronisation between video and audio (C5, Madrid) Audio from Naples and Aveiro was not understandable; there was some echo when two people were talking simultaneously (C4, Madrid) Yes, there were some problems when the audio-video was coming from Naples (C4, Madrid) Yes the audio was cut at one point. The video is not of an acceptable quality to the user. Special emphasis should be placed on solving the audio-video synchronisation (C4, Madrid) There was a high volume level today (B2, Madrid) There was some echo (B2, Madrid) Had problems with echo and the volume level (B2, Madrid) Yes sometimes the network doesn't work (B2, Madrid) Audio could be improved by reducing echo (B2, Madrid) Echo in the Napoli connection, low volume level (B2, Madrid) Experienced some problems with the echo (A4, Madrid) There were problems with echo and volume level, also some cuts in transmission (A4, Madrid) Lack of synchronisation between audio and video (A4, Madrid) There were a few problems with echo (A4, Madrid) Sometimes there is some echo (A4, Madrid) There was feedback and echo (A5, Madrid) There were some problems like echo, lack of sound (A5, Madrid) There were some echo problems (A5, Madrid) I expected better quality (A5, Madrid) There were some faults, but it's an experiment (B4, Madrid) Sometimes, the video disappeared, the quality was OK (B2, Aveiro) Yes, with the volume level and perception of audio (B4, Aveiro) I don't recall feedback or echo, but the volume level and quality were not great all of the time. Only had problems with the small black squares (where there should have been white, I think) (B4, Aveiro) Volume level and quality were not great all of the time (B4, Aveiro) Noise (A4, Aveiro) It was very quiet (A4, Aveiro) There were breaks, echo and volume (B4, Aveiro) There were some jumps, the session was cut before the end (C1, Aveiro) It was understandable, but not good (B2, Aveiro) Had the impression that the audio suddenly got better at one point, no major problems (A5, Belgacom)

Was the video appropriate for this presentation?

Yes (C7, Berlin) (C7, Berlin) (B4, Berlin) (A5, Madrid) (Berlin) (B4, Berlin) (B4, Berlin) (C5, Madrid) (C4, Madrid) (C4, Madrid) (C4, Madrid) (B2, Madrid) (B2, Madrid) (B2, Madrid) (A4, Madrid) (A4, Madrid) (A4, Madrid) (B4, Madrid) (B4, Madrid) (C1, Aveiro) (B4, Aveiro) (B4, Aveiro) (A4, Aveiro) (A4, Aveiro) Most of the time (Berlin)

Size of picture was a bit too small, quality good enough as it is (Berlin) Probably (images were too small) (Berlin) It could be better, it was a little monotonous (B2, Madrid) Yes, enough quality (A4, Madrid) Good presentation, medium quality (A5, Madrid) More or less (A5, Madrid) This presentation in particular, as with the majority of the others had a very good video quality (B2, Madrid) Reasonable (B4, Aveiro) Not perfectly; general unbalanced framing (B3, Aveiro) Not appropriate because it should have been more interactive (B2, Aveiro)

Expectations in terms of audio/video quality

More than I got (C7, Berlin) Was expecting better quality (C7, Berlin) No fixed expectations (Berlin) Expected better picture quality (Berlin) Video should have been of higher frame rate and higher resolution. Audio is OK if stable. I expected TV quality, but, well... (B4, Berlin) Was expecting better audio (Berlin) Yes (Berlin) Thought it would be better than m-bone, but the advantage doesn't seem to be obvious (B4, Berlin) I have worked with bandwidths of 128 kbps, here the quality is better (C5, Madrid) Wasn't expecting anything (C4, Madrid) I expected higher quality audio (C4, Madrid) Expected better quality (C4, Madrid) Something better (C4, Madrid) Was expecting more quality in terms of video because of the promises of ATM technology (B2, Madrid) Was expecting better quality (B2, Madrid) The video was slower than what I was expecting, audio about the same as expected (B2, Madrid) More or less the same quality (B2, Madrid) Video was poorer than expectations (B2, Madrid) Was expecting a more continuous transmission (A4, Madrid) I would expect audio to have been better (A4, Madrid) No prior expectations (A4, Madrid) Expected better video quality (A5, Madrid) I thought the audio and video would be better than they actually were (A5, Madrid) Was expecting better synchronisation between video and audio (C1, Aveiro) In comparison with previous experiments, I expected the quality to be worse (B2, Aveiro) I wasn't expecting that much delay between the video and audio (B4, Aveiro)

The quality of the video-audio fulfilled expectations (B2, Aveiro)

I expected better sound quality and a higher number of video frames per second (B4, Aveiro) Expectation due to little movement of the speaker, corresponded to my expectations (B3, Aveiro)

Before the Summer School started, I was expecting the quality from what I know of ATM. After the previous sessions, this one came out just like I expected (B4, Aveiro)

I was expecting TV quality from what I know of ATM.

Was expecting not too much of what happened (A4, Aveiro)

Better than yesterday (B4, Aveiro)

Better audio and video quality (B4, Aveiro)

Better synchronisation between video and sound and a better frame rate (B4, Aveiro)

Something nearer to TV quality (B2, Aveiro)

Based on ISDN connectivity- it was approximately the same (A4 Belgacom)

I'm used to videoconferencing on narrowband ISDN (A5, Belgacom)

Was the presentation medium appropriate?

Powerpoint slides were good support for lectures (Berlin) Slides were appropriate, but sometimes the text was too small (Berlin) Powerpoint was OK, animation would have been better (Berlin) Slides were OK, but presenter didn't really use pointer device (B4, Berlin) Rather restrictive- no animation possible (Berlin) Powerpoint presentations were not appropriate, they need more co-ordination with the same media (C4, Madrid)

Yes (C4, Madrid)

When a video was played, the window with the speaker in disappeared (B2, Madrid)

Text was too small (B2, Madrid)

The slide quality was deficient (C1, Aveiro)

I guess some lecturers didn't know the basic procedures for putting information onto transparency, and they put too much info down- that was the case with Mr Oodan (B4, Aveiro) I think that presentation techniques for the sessions should be rethought, and we now have low contact between the speakers and delegates (Aveiro)

Yes, the presentation software was quite appropriate (but I'm sure if it uses Powerpoint because the interface looked like X-Windows) (B4, Aveiro)

Yes, the presentation software was quite appropriate (B4, Aveiro)

There was a lack of animation, would suggest the use of authorware, like Macromind Director (B4, Aveiro)

Slide text was too small (B2, Aveiro)

A lot of people are only convinced if they see real examples, these are good, need more of these (B2, Belgacom)

Comments on screen layout

Bigger speaker windows required (C7, Berlin) Good (C7, Berlin) (C1, Aveiro) Quite nice when it worked (Berlin) The speaker was too small during presentations (Berlin) OK, during multi-presenter sessions it would be nice to see them all on one screen (B4, Berlin)

Good (B4, Berlin)

Could have used more, and larger images (Berlin)

OK (Berlin)

Quite good (C5, Madrid)

OK (C4, Madrid)

It's good (C4, Madrid) (A5, Madrid)

Would benefit from better quality (C4, Madrid)

I think it's good (C4, Madrid)

Everything is OK (B2, Madrid)

Generally good, but the image of the speaker was very small (B2, Madrid)

Better than yesterday (B2, Madrid)

Illumination could have been better (B2, Madrid)

When the link works it's OK (B4, Madrid)

Good, although the windows are not always aligned and stable (B2, Aveiro)

Reasonable (B3, Aveiro)

Well planned, but the transitions were cumbersome (e.g., the windows kept changing size consecutively for several times until they matched the desirable size (B4, Aveiro)

Audio didn't keep up. Split screen fine. When the speakers image disappeared just like a TV documentary, the image of the speaker should be much larger, suggestion: L-shaped sides (B4, Aveiro)

Mostly good, although Thierry had to move his local monitor about, this should be avoided (A4, Belgacom)

Prefer to have two images only on screen, 3 would be inappropriate, unless you really need them (A5, Belgacom)

If there are 3/4 parties it might be interesting to see all of them, but if there are more sites it would be too easy to overload it (B2, Belgacom)

Question and answer sessions, interactions

Presenter/Speaker interaction could have been more fluent (C7, Berlin)

Presenter/speaker interaction is very difficult between different locations (Berlin)

Not enough presenter/speaker interaction (Berlin)

There was limited time for questions, but that's normal. Sometimes the presenter/speaker interaction was a bit confusing, but in general it was OK (B4, Berlin)

Speaker-presenter, and speaker-questioner interaction was good and well organised (B4, Berlin) In the interaction involving Madrid presenters- presenter- speaker, the Madrid presenter seems to be unnecessary (Berlin)

Speaker-presenter interaction felt rather contrived (Berlin)

Don Cochrane was excellent (B4, Berlin)

Presenter-speaker interaction was not very good. Speaker-questioner interactions were even worse, not understandable due to data loss/delay (B4, Berlin)

Presenter-speaker interaction was good (B4, Berlin)

Speaker-questioner interaction was quite good (C5, Madrid)

Good presenter-speaker, and speaker-questioner interaction (C4, Madrid)

Good presenter-speaker, and speaker-questioner interaction (C4, Madrid)

Interaction was OK- fairly good (C4, Madrid)

There were some problems of communication with presenter-speaker and speaker-questioner interaction (C4, Madrid)

Presenter-speaker interaction was nice (B2, Madrid)

There were few opportunities to ask questions; interaction between speaker and questioner is fast (B2, Madrid)

Poor presenter-speaker interaction, problems with the co-ordination and organisation. The speaker-questioner interactivity works (B2, Madrid)

Speaker-questioner interaction was well resolved (A4, Madrid)

Liked speaker-questioner interactions (A4, Madrid)

Wasn't well informed about asking questions; speaker-presenter, and speaker-questioner interactions were well synchronised (A5, Madrid)

It depends on the site; the interaction with Belgacom was almost perfect, however the link with Aveiro was pretty bad (A5, Madrid)

Presenter-speaker, and speaker-questioner interactions were really good, and continuous (A5, Madrid)

The presenter-speaker interaction was good enough and improves with experience. There wasn't much interaction between the speakers and questioners (B4, Madrid)

We have to rethink existing presentation techniques (Aveiro)

Limited time for questions (B4, Aveiro)

I had no opportunity for asking questions (B3, Aveiro)

Presenter-speaker interaction wept attention (B3, Aveiro)

I didn't want to ask a question, but someone else here did, and couldn't, due to time restrictions (B4, Aveiro)

Good floor management. Interaction had been rehearsed, audio pretty well tuned. Speaker-questioner interaction was very difficult, late audio (B4, Aveiro)

There were some problems synchronising between sites (C1, Aveiro)

Didn't think there was any interaction in this session (B2, Aveiro)

The presenter-speaker interaction was quite smooth, 2 ppl in Madrid seemed OK, good synchronisation (A5, Belgacom)

The conference needs presenter-speaker interaction, especially if there has been more than one presentation (B2, Belgacom)

Level of participant involvement

Felt part of local audience only (C7, Berlin)

Didn't feel much involved (C7, Berlin)

Yes, felt part of event (Berlin) (Berlin) (B4, Berlin) (B2, Madrid) (A4, Madrid) (A4, Madrid) (A5, Madrid) (A5, Madrid) (C1, Aveiro) (A4, Aveiro) (B4, Aveiro)

Yes and no. Yes I felt that there were other sites involved, but not 20 other sites (Berlin) Yes, felt part of whole event, but difficult to realise full scope (B4, Aveiro)

Felt part of local audience, a second window for international sites was missing (Berlin) Felt rather detached, very local impression. No idea of other audience (B4, Berlin) Didn't really feel part of 'whole' event, only at times, when seeing the windows of other sites on screen (B4, Berlin)

So-so (B4, Berlin)

I felt mostly part of the local site only, although I'm aware of the other sites all over the world (B4, Berlin)

Finally you feel part of the entire summer school event (C4, Madrid)

Only feel part of the whole event when the lecture and actuations were dynamic (C4, Madrid) No sense of unity, felt like the different parts were put together (C4, Madrid)

Felt a little bit part of the whole summer school event (C4, Madrid)

Sometimes felt involved in whole event, especially when there were lots of windows on the screen (B2, Madrid)

Felt involved in something local (B2, Madrid)

Didn't feel fully involved in the whole event, since you lose some human contact between students and lecturers (B2, Madrid)

More or less felt involved in the whole event (A4, Madrid)

I felt part of the whole event, but it is uncomfortable due to the audio quality (A4, Madrid)

Yes, most of all because of the language and the atmosphere (A5, Madrid)

While the presentation techniques do not evolve, following this new technological environments, the integration of everyone in the global whole will be quite difficult (Aveiro)

Most of the time I felt part of 2-3 sites, very few times I felt part of more, and even sometimes I almost fell asleep and wasn't even part of the local audience! I only felt really part of the whole audiences during some of the 'social type' interactions, namely the Mexican wave (B4, Aveiro) Yes, I felt part of the whole event, and I fell that this is something to promote in the middle of scientific communities (Aveiro)

Good involvement (B3, Aveiro)

I think this is the one thing I will remember from this Summer School, that is I really enjoyed feeling a part of a distributed audience (B4, Aveiro)

Felt more local than part of the whole thing (C1, Aveiro)

The presenter always talks to the camera, leaving the audience a little distant. Doesn't allow proximity (B2, Aveiro)

There was nothing indicating that other sites were involved, except when other questions were raised (A4, Belgacom)

Had the impression that it was a remote lecture, but no impression that other sites were involved. It is difficult to manage real-time interactivity (A5, Belgacom)

Not used to concept yet (B2, Belgacom)

Best things about session

Slides were good (C7, Berlin)

Cutting down the distances between participants (Berlin)

It was more relaxed, and avoided travelling (Berlin)

The idea that it was a distributed event (B4, Berlin)

The distribution (Berlin) It was uninterrupted (Berlin) Visibility is better, but the personal contact is missing (B4, Berlin) It overcomes the physical distance problem; it gives more chance for conference and education (B4, Berlin) Better quality (B4, Berlin) Access to the knowledge of foreign speakers (C5, Madrid) The opportunity to find out the opinions, and to approach people without travelling (C4, Madrid) Remote access is possible, this isn't possible in traditional conferences (C4, Madrid) It is more international (C4, Madrid) The interaction between images and slides (B2, Madrid) Technical reasons- to see future experiences (B2, Madrid) No need to move (travel) to hear these interesting speeches (B2, Madrid) The Summer School event is more spectacular (B2, Madrid) Better interactivity (B2, Madrid) Lower conference costs; it requires more efforts from the student to attend it (B2, Madrid) More people can see it at less cost (A4, Madrid) It is almost in real time (A4, Madrid) It is multi-site (A4, Madrid) ISDN networks have more delay (A4, Madrid) The multiple interactions (A5, Madrid) You didn't need to make long trips around Europe to get to these conferences. It's very comfortable for the user (A5, Madrid) There are more mediums to be used (A5, Madrid) The presenters seemed to be professionals (B4, Madrid) The possibility to exchange ideas between people that would not otherwise have met, or even to talk to each other (Aveiro) Mainly (or should I say only) the fact that lecturers and audience didn't have to spend the time journeying to the same place to attend the conference (B4, Aveiro) It was made with simple audio visual means, but with creativity and imagination (Aveiro) I saw results here with better quality (B4, Aveiro) It was sufficiently real (B3, Aveiro) The only real gain is the obliteration of distances (B4, Aveiro) There is more interactivity and people don't feel so inhibited as in the traditional conference, however traditional conferences aren't so intimately linked with technology (A4, Aveiro) Overall quality of slides, uniformly good (B4, Aveiro) Reduced distance to travel, apart from that traditional conferences are still better (B4, Aveiro) Interactivity between several sites (C1, Aveiro) The geographical aspect, no need to travel, sharing know-how (B2, Aveiro) No particular advantages (A4, Belgacom) The reduction in travel, potential of more people to attend the event, it is more easy to justify going to the event (B2, Belgacom)

Worst things about session

Some slides didn't come. Confusion of local audience and speaker (C7, Berlin) Aspects of synchronisation of audio-video (Berlin) The quality of the audio-video was unstable (B4, Berlin) The audio; there were less interactions with the listening audience (Berlin) Limited visual aids were available (Berlin) The personal contact is missing (B4, Berlin) It cannot give people the freedom to make personal communication, less fun! (B4, Berlin) Sometimes there was a synchronisation problem (B4, Berlin) Lack of direct contact (C5, Madrid) The quality (C4, Madrid) It is poor, there is no motivation of the audience (C4, Madrid) There was too much, "can you hear me?" being asked (C4, Madrid) The speaker feels further away to me, and he loses the main role in the conference (B2, Madrid) Failings in technology Not enough bandwidth, slow video (B2, Madrid) The speaker can't see people's faces (B2, Madrid) Technical details, and the ability to only have 2 images simultaneously on screen (B2, Madrid) The co-ordination between the technical and human parts (B2, Madrid) The co-ordination, a lack of culture of how to cover these events (A4, Madrid) The temporary cut-offs (A4, Madrid) It is harder to follow (A4, Madrid) Reliability compared to ISDN was a bit lower (A4, Madrid) Sometimes speakers didn't use the pointer tool (A5, Madrid) The technical problems (A5, Madrid) You feel that the speakers are far away from you (A5, Madrid) The lack of interaction during some moments (B4, Madrid) In general the presentations were made as if this was a traditional conference (Aveiro) Obviously the problem in the network (C1, Aveiro) The state of the art technology (B4, Aveiro) There weren't any (Aveiro) The interruptions that the system caused. It is very centred on the media that it uses, and not so much with the contents (B4, Aveiro) There weren't any worst things (B3, Aveiro) Compared to a traditional conference, the presenters lacked the eye contact with most of their audience, and also suffered from the occasional video and/or sound disruptions (B4, Aveiro) Technical problems (A4, Aveiro) Couldn't move about (B4, Aveiro) Understanding audio is too difficult (B4, Aveiro) Interaction in the connection, some was too long (C1, Aveiro) The lack of gestures, eye-eye contact. Technological equipment should be out of sight of the audience: these are all distracting effects (B2, Aveiro) Some additional tools e.g. pencil on screen could have been useful to make it more attractive. Sometimes you lose your attention, depends a lot on the lecturer, even during local sessions.

Even if interactive, there was only the feeling that there were two participants (A5, Belgacom) Apart from the fact that it's still experimental and you can run into technical problems, but the same can happen with ISDN conferences (B2, Belgacom)

Was the network quality sufficient?

Yes (C7, Berlin) (Aveiro) (Berlin) (Berlin) (B4, Berlin) (C4, Madrid) (B2, Madrid) (B2, Madrid) (B2, Madrid) (A4, Madrid) (A4, Madrid) (A4, Aveiro) We should have seen that it is, have we not? (Berlin) Sufficient (Berlin) (B4, Aveiro) Problems of a technical nature Audio was interrupted, and there was echo (Berlin) In general yes, but no short discussion possible. Especially, it is not possible to ask questions during a lecture (B4, Berlin) No. I think the behaviour of speakers at the time of questions needs some written instructions e.g. don't move around, start with introducing yourself etc. (B4, Berlin) No. Network performance and QoS (B4, Berlin) There were a few problems with the audio (C4, Madrid) It depends upon the end equipment (C4, Madrid) Yes, more or less, perhaps it needs more experience (C4, Madrid) There have been some problems with the network link. I don't think that the quality of physical links has been sufficient to enable the successful answering of questions from the floor (specially with satellite links- audio information) (B2, Madrid) The quality is not good enough- it should be more efficient in all senses The quality was not good enough (A4, Madrid) Better quality would be desirable (A4, Madrid) Yes, more or less (A4, Madrid) Not enough bandwidth (A5, Madrid) Quality is enough (B4, Madrid) In general, yes (C1, Aveiro) Yes, but barely (B2, Madrid) Yes, the quality was enough, but the users had to go through a progressive learning period in the usage of these technologies (Aveiro) It was enough (B3, Aveiro) Most of the time, it was. The rest of the time I believe that a peak of 6 Mbit/s is not enough. There was a delay between the visual and audio, questions were very quiet (B4, Aveiro) For most of the time (B4, Aveiro) Yes, aside from the problems of simultaneous access to two sites (C1, Aveiro) Generally, yes, although there were a few technical problems (A4, Belgacom) Ok, but technical problems interrupt the continuity of the conference, because each time they happen you lose your concentration (A5, Belgacom)

Where there any problems of a technical nature?

The organisers apologised, explained and offered coffee (B4, Berlin)

There were problems, but as an engineer I understand these kind of things in large-scale systems (B2, Madrid)

Sometimes the connection didn't work (B2, Madrid)

There was some confusion while the technical problems were happening (B2, Madrid)

They solved most of the problems (B2, Madrid)

Italy couldn't connect (A4, Madrid)

Yes, but they (the organisers) controlled the problem as fast as possible (A4, Madrid)

There were some disconnections (A4, Madrid)

Yes, until now they have been dealing with them very well (A5, Madrid)

These were dealt with quite well (B2, Aveiro)

It is the second day of the presentations of this meeting to the presenters/speakers/organisers and the audience and getting quite experienced in dealing with the difficulties (B2, Madrid)

Yes, they were dealt with in a reasonably competent manner, but the several cold reboots seemed quite unprofessional (B4, Aveiro)

Sound interference (B4, Aveiro)

Yes, a break in the connection to Madrid (during 1 hr), looked like it was the end of the session (C1, Aveiro)

None in this session, but during Eric's presentation (B1) the problem got fixed fast, this was acceptable.

What were your prior expectations of the Summer School

I was expecting more in depth talks (C7, Berlin)

I had no expectations, was very curious about it, I was surprised in a positive way (Berlin) Expected more multi-media (Berlin)

I expected it to be a lecture on communications. Yes my expectations were fulfilled (B4, Berlin) They were partially (half) fulfilled, yes (Berlin)

Yes (Berlin)

Nearly, yes (B4, Berlin)

Expectations was to get an idea of the general theory and to get some tips for the implementation of ATM e.g. for the user interface (B4, Berlin)

To acquire knowledge, think this was fulfilled (C5, Madrid)

Didn't have any prior expectations, good opinion (C4, Madrid)

To find out about a new aspect of telecommunications, yes this was fulfilled (C4, Madrid)

To know about the state of the art technology, perfect quality Summer SChool Mbit/s is not likely until next century! (C4, Madrid)

To update my knowledge of broadband communications; this was more or less fulfilled (C4, Madrid)

My prior expectations were to get important, updated information about the market and technical situation of broadband communication and a real demonstration. Yes, these were fulfilled (B2, Madrid)

Interested in bandwidth material and to see how the Summer School was organised (B2, Madrid) I thought there would be more on ATM (B2, Madrid)

To see this kind of videconferencing event, yes it was fulfilled (B2, Madrid)

Expectations fulfilled (B2, Madrid)

No, I was expecting some South American countries to be involved (A4, Madrid)

It is going according to my prior expectations, but following it is harder than I expected due to poor audio quality (A4, Madrid)

Yes, for the moment, but it is the first day (A4, Madrid)

To find out about the real prospects of ATM and actual projects currently going on (A4, Madrid) To catch a glimpse of the latest broadband and ATM technologies (A5, Madrid)

The contact with new state of the art technologies, in theory and practise, and it did work (Aveiro)

My expectations were fulfilled, following what happened in previous years. I was expecting however less network failures, which may even have some interest- but not if they take so long as in session C1 (C1, Aveiro)

In reality, I did not have any idea what was the summer school, so expectations were fulfilled (B2, Aveiro)

It was what I expected (except for the delay of the image) and I wasn't at all impressed with the impact of long video conference sessions on big audiences. I think it is very important the lively interventions of local (ie. real, or live) people (B2, Madrid)

Reflection on multimedia techniques, and to test them once more; the objectives were achieved (Aveiro)

To acquite general knowledge of ATM (B4, Aveiro)

I was expecting something close to a closed circuit TV system, and thus my expectations were not fulfilled in terms of frames/second (B3, Aveiro)

I expected to learn some more about the main broadband issues, and to listen to several different points of view on them. Yes, these expectations were fulfilled (B4, Aveiro)

Expected that after 4 years the technology should be more stable. Surprised at the low badnwidth being used (B4, Aveiro)

I expected better quality since last time I visited the Summer School I understood that most of the persisting problems were not technical and were not due to the great number of sites involved (B4, Aveiro)

Bigger interactivity between participants and presenters, more information about a Summer School and a videoconference without any long interuptions. It wasn;t completely achieved (C1, Aveiro)

To find out about a global view between telecoms and IT. Peter tried to go too much into depth for the time allocated. I was surprised that T.Bosser's presentation was a commercial one (A4, Belgacom)

Have an interest in global telecoms network evolution aspects and topics related to this, and how they are applied. Expected to learn about these, and service integration aspects (A5, Belgacom) Conference topics are relevant to my needs, useful to know where the internet is going with the technical side (B2, Belgacom)

Are BroadBand communications rich enough and appropriate to support this type of event?

Yes (C7, Berlin) (B4, Berlin) (C5, Madrid) (B2, Madrid) (Berlin) (C4, Madrid) (A4, Madrid) (B4, Aveiro)

In general yes. I think that picture quality has to be improved (by higher bandwidth) (Berlin) Yes, but with less bandwidth the same results should have been possible (Berlin)

Broadband yes, interaction, support-no (Berlin)

No (B4, Berlin)

Not yet, but in the future it may be (B4, Berlin)

It is appropriate (C4, Madrid)

Yes, but this is only an experimental event (C4, Madrid)

Not at all (C4, Madrid)

I think that it's the best medium, but there are a lot of things that need improvement (B2, Madrid) Yes, it could be possible to use more of the broadband (B2, Madrid)

Yes, appropriate and useful (B2, Madrid)

Yes, it's enough (A4, Madrid)

Yes, but the implementation is not good enough (A4, Madrid)

Almost appropriate (A4, Madrid)

Not enough yet (A5, Madrid)

Obviously (Aveiro)

Yes, as the technical problems are solved (C1, Aveiro)

Yes, although some problems should be solved, but I believe it will be of extreme importance in the not too distant future (B2, Aveiro)

Yes, as long as the medium is novel and deeply related with the content of presentations (B2, Madrid)

Yes, however I think that in remote studios, it is harder to grab audiences, and this demands a larger effort in presentation techniques and more imagination in order to obtain more dynamic presentations (Aveiro)

Yes, although the error correcting algorithms were not the best (B4, Aveiro)

Yes, I think the media is rich enough for these type of experiments (B3, Aveiro)

Yes, and I noticed the advantages, for instance money saving on travel, surpass it's disadvantages (B4, Aveiro)

Eventually it will be (B4, Aveiro)

In part I believe the probles are in terminal equipment and not in the network (C1, Aveiro)

Yes, although not sure if other facilities exist that can support it (A4, Belgacom)

Has a future, there is room for development, the merit is that it brings lots of people together, concept is good, just a matter of using it now (A5, Belgacom)

The technical side is there, sound/video synchro needs a bit of work. People are used to TV, but people are used to dubbed movies in Belgium so poor synchro is not so annoying (B2, Belgacom)

Any other comments

Liked friendly and nice atmosphere between all participants (Berlin)

Good atmosphere during the Summer School (Berlin)

If you had experience with video-conferencing technology you know what to expect, and ABC would have fulfilled your expectations. If you have never been exposed to this before and expected a somewhat enhanced traditional Summer School, you were probably dissapointed. I do think that elecommunication, from UNIX talk, to ATM A/V conferencing can be useful and helps to overcome spatial restrictions and that's what it;s good for. If you can get people together in one room, then you should do that, if not, then use information-carrying networks. Personally, I believe we will have broadband mobile IP in the end and everyone participates in such events from their own personal device from whatever location. ABC is somewhat halfway between a traditional conference and my vision. You might say, on the wrong track. But then, that's waht we have as technology now and I do think it has been put to good use (B4, Berlin)

It is an exciting experience to understand the status of ATM by seeing how it fails, the organisation of ABC '96 is a good try (B4, Berlin)

Too many subjects were treated in too little time (C5, Madrid)

See you at ABC '97 (C4, Madrid)

Documentation should be in two colours at least! Also it should be clearer (C4, Madrid)

I thought that companies (in Spain) were much more interested in this theme and I expected more presence of them here (B2, Madrid)

I hope I will be here next year (B2, Madrid)

Some students who are working with the organisation of this event do not have all of the documentation (B2, Madrid)

See you at ABC '97 (B2, Madrid)

I hope that the participation of Latin-American countries will be more competitive next year (A4, Madrid)

See you at ABC '97 (A4, Madrid)

Improve the technical part; needs better organisation (A5, Madrid)

I would like to make a remark on the importance that this kind of activity has, in testing the network structures that already exist (A5, Madrid)

It seems like we're on the right track! (Aveiro)

Avoid, as much as possible, the choice of speakers with doubtful communication capabilities, which, associated with the communication media, made some tasks quite heavy. A word of appreciation for the quality and professionalism of the work of Rui Aguiar, with performance during sessions clearly above average (C1, Aveiro)

Congratulations I you did an excellent job; the organisation was great and you have achieved a very good technical level all around (B2, Madrid)

I think it should continue. I think that a session should exist with a theme approached in depth (Aveiro)

It may be better to create two working groups, one technical, to learn/clarify ways of implementation, the other generic, to get acquainted with the technology (B4, Aveiro)

I think that events like ABC should be carried on, as they allow a fast and easy access to new ideas, although I think that there wasn't any confrontations of ideas, which may be more fruitful. I also think that Isabel needs some more development, that is, it can be improved (B3, Aveiro)

I think that the people that have made possible the ABC '96 have to be congratulated for the overall success of the event. Furthermore, I believe that if there was a bit of dissapointment in some of the attendees of the Summer School, that was mainly caused by the relatively low bandwidth used (6-8 Mbit/s) and to the fact that the technologies used were very new and so couldn't quite guarantee the kind of reliability from the traditional systems, like the telephone. This event has certainly contributed to people's experience on said technology, of which reliability will in the future be a natural consequence (B4, Aveiro)

It was a very noteworthy trial, I will come again (B4, Aveiro)

Didn't hear about it until last week- maybe publicity was a little lakcing. There should have been a button that the members of audience can press, to indicate when they want to ask a question. It could indicate if there are several questions at some sites (A4, Belgacom)

It is quite tiring to follow the event due to the quality; people are not quite used to what it could be. The A3 session was not appropriate for such a short time, it should have been at a higher level (A5, Belgacom)

The scheduling, people have to keep to it strictly. Have doubts about using ISDN technology. Depends how much you know about the technology, will it be a commercial product? Possibly, when the bandwidth is in place.

Hour	Activity/Comments	Time	Clip ping	ISDN	Sound Fault	Local Sound Fault	Echo	Image Delay	Sound connec -tions	Search ing icons	Image Fault	Frozen Image	Wrong big window	Prog. Chage	Co-ord Fault
	TUESDAY MORNING 9/7/96														
9:00	Start. Presentation of the course								•						
9:15	Pause while preparing next connection	4 mins													•
9:20	Introduction from Brussels														
	Window type stamped at side	5 sec						•				•	•		
	They were late getting their data	4 sec													
	Video of Napolean of deficient quality, images running and the flicking made it difficult to follow														
	Didn't get the end														
9:45	Video of Napolean - frozen image - stopped											•			
9:47	Passed manually to local video (no graphical interface)														
9:51	Continuation of programme														
10:00	A tour of sites														
	- Aveiro														
	- Berlin: small window												•		
	- Naples problems connecting, clipping		•						•				•		
	- Brussels: Loud sound connection														
10:05	Presentation of the programme									ĺ					

Appendix 7 - Evaluation of technical problems at Madrid Site

10:06	Connection with Brussels					•				
	Excessive echo									
	BREAK									
	To rearrange the system and adjust the audio									
10:45	Continuation									
	Moderated by Brussels									
	Followed by echo from our audio					•				
11:20	Questions									
	- Naples: small image, deficient sound			•	•				•	
11:30	BREAK									
11:45	Connection with Brussels. Ist topic									
12:15	Connection with Berlin. 2nd topic									
12:30	Questions with both participants				•					
	- Aveiro: sound fault	1 min						•		
	- Brussels: image fault		•							
	- Naples: clipping									
12:55	END OF SESSION									
	Cold Boot									

Hour	Activity/Comments	Time	Clip ping	ISDN	Sound Fault	Local Sound Fault	Echo	Image Delay	Sound connec -tions	Search ing icons	Image Fault	Frozen Image	Wrong big window	Prog. Chage	Co-ord Fault
	TUESDAY AFTERNOON 9/7/96														
14:20	Start. Presentation														
1423	Moderated by Aveiro - Aveiro: 1st statement "Future visions of Telecomms" Image fault	1 min									•				
14:40	-Brussels: 2nd Statement Echo in the sound of Aveiro for Brussels						•								
15:04	End of statements, control with Aveiro						•								
15:15	BREAK														
	Rearrangement of the system, had to change parameters of the ATM in Europe so had to re adjust.														
16:00	START. Change in the programme. Left with Naples to the end													•	
16:05	Moderated in Madrid - Madrid "Technical Realisation of ABC 96"														
16:43	Questions														
	 KPN: only hear low audio, connected quickly Naples: clipping in the sound 		•												

17:00	End of questions. Control in Madrid									
17:05	Moderated in Madrid									
	- Berlin: "Modelling the summer school"	10		•						
	Poor sound at start	mins								
17:35	Questions - Brussels: they had a question for the previous session - Aveiro									
17:38	BREAK									
17:45	Moderated Madrid - Naples:"The NICE project									
	and"	3		•				•		
	Lost the image, sound low - Naples:"Future visions of Telecoms"	mins								
	Variations in sound quality, clipping during all the session, kept losing the image		•	•				•		
18:22	Passed control to Madrid.									
	Questions									
	-Aveiro : faulty image but had sound							•		
18:26	Tour of the sites for their impressions of the first day									
	-Brussels, Aveiro, Berlin									
	- Naples				•			•		
12:55	END OF TUESDAY									

Hour	Activity/Comments	Time	Clip ping	ISDN	Sound Fault	Local Sound Fault	Echo	Image Delay	Sound connec -tions	Search ing icons	Image Fault	Frozen Image	Wrong big window	Prog. Chage	Co-ord Fault
	WEDNESDAY MORNING 10/7/96														
9:15	Start. Fault in the source sound Moderated Brussels - Brussels "IETF Vision of the Future"	2 mins				•									
9:30 9:35	Sound and image fault Sound and image fault Ocassionally lost the sound	1 min 5 mins			• • •						•				
9:50	Sound and image fault	I min			•						•				
10:05	Questions - Naples: Lost all the connections - Lot of echo in Brussels				•		•				•				
10:15	Tour of the sites														
	 EU host: not able to connect Berlin: not able to connect Naples: not able to connect Madrid: good 				•						•				
10:17	Faults continued, sorting it in Madrid	3 mins													•
10:20	Moderated in Aveiro Change in programme - Madrid "Groupware"													•	
10:46	Questions														
10:50	Control passed to Madrid Tour of the sites														

10:55	BREAK while sending out some slides cold boot										
11:30	Preparations	30 mins			•				•		•
12:05	Moderated Berlin: "Object Oriented Platform"										
	- Brussels: "Distribution & Integration"										
12:35	Appearing and disappearing small windows							•			
12:45	- Madrid: "Microsoft"										
13:05	- Naples: "Java" Awful sound with clipping for all the lecture		•	•							
13:07	lost the image	6 mins							•		
13:30	Questions										
13:40	END OF MORNING SESSION										
	cold boot										

Hour	Activity/Comments	Time	Clip ping	ISDN	Sound Fault	Local Sound Fault	Echo	Image Delay	Sound connec -tions	Search ing icons	Image Fault	Frozen Image	Wrong big window	Prog. Chage	Co-ord Fault
	WEDNESDAY AFTERNOON 10/7/96														
15:00	Start. Moderated in Naples - Naples: "QoS" Low sound with clipping Image fault	10 mins 3 mins	•							•		•			
15:25	- Aveiro: Don Cochrane (2nd session)														
15:40	- Brussels: Oodan (3rd session)		•		•						•				
16:05	Questions: -Aveiro: bad image and poor hearing - EU host: not able to connect -Berlin: could not hear Naples ISDN network problems		•	•	•	•					•				
16:20	First connection with Canada														
16:25 17:00	BREAK Moderated by Aveiro -Brussels: "Wireless Networks & Hyperland		•	•						•					
17:22	Questions														
17:25	- Aveiro: "Video over Wireless"														
17:50	Questions														
17:55	-Madrid - "Multimedia services"														
18:15	Questions														

18:25	Preparation for the connection with Canada	10 mins		•			•		
18:35	Canada: "CANARIE"								
18:55	Questions								
19:05	END OF WEDNDESDAY								

Hour	Activity/Comments	Time	Clip ping	ISDN	Sound Fault	Local Sound Fault	Echo	Image Delay	Sound connec -tions	Search ing icons	Image Fault	Frozen Image	Wrong big window	Prog. Chage	Co-ord Fault
	THURSDAY MORNING 11/7/96														
9:13	Start. Moderated in Brussels - Brussels; "Optical Switching" changing a slide led to sound faults				•										
9:48	Questions - Berlin: image fault									•	•				
10:10	Control to Madrid. Pause whilst preparing	8 mins													•
10:18	Moderated in Madrid - Madrid: "Evolution of Telecoms Services Management"														
10:50	Questions (Brussels, Madrid, KPN)														
10:55	Site visits (Switzerland & Sweden)														
11:00	BREAK														
11:40	Start. Moderated in Naples - Brussels: "Charging by Value in ATM"		•	•											
12:07	Questions (Brussels, Berlin, Madrid, Switzerland) Lost the connection with Berlin & Aveiro														

12:20	Control pased to Madrid							
	Connection with Aveiro. Lost							
	entire connection between							
	Aveiro and Madrid. Not							
	sensible to put up with it.							
	Therefore changed							
	programmed to the afternoon.							
12:25	END OF MORNING							
	SESSION							
	rearrangement of the system							

Hour	Activity/Comments	Time	Clip ping	ISDN	Sound Fault	Local Sound	Echo	Image Delay	Sound connec	Search ing	Image Fault	Frozen Image	Wrong big	Prog. Chage	Co-ord Fault
			1.0			Fault		5	-tions	icons		U	window	U	
	THURSDAY AFTERNOON 11/7/96														
14:15	Start. Moderated in Brussels - Brussels: "Multimedia Network Architecture"									•					
14:50	Question (Naples, Canada, Brussels)														
15:00	Control passed to Madrid Demonstration with 9 windows and 9 connection (Mexican Wave) Let foult Madrid (DIT) and														
	one corner 2nd fault Madrid (DIT) didn't see the consequence										•				

15:06	Moderated in Naples Tried to connect with Brussels. Image problem				•			•		
	Connections with Naples	1 Min	•							
	Sound ISDN fault									
	Connection with Brussels									
	Control to Naples									
	- Brussels: "Service Interact.									
	In Broadband Comms."									
	Sound problems with ATM			•						
	couldn't hardly hear anything		•							
	Sound problems with ISDN:		•	•						
	Change in clide led to sound									
	fault									
	Afterwards the sound returned									
	to ATM									
15:40	Question (Canada, Naples)									
15:50	BREAK									
16:20	Continuation. Moderated in									
	Aveiro									
	- Berlin. "Tele									
	(visio/communication)"	•								
	When to speak to Aveiro,									
	don't understand anything									
16:30	Sound low quality. Losing the	8	•					•		
	image	mins								
	- Madrid: "Challenges in the									
	Design of"									
17:20	Questins between the two									
	speakers									

17:25	Control passed to Madrid							
	Technical discussions between							
	Madrid, Brussels and Berlin							
	(because tested the ISDN							
	backup)							
	According to Brussels the							
	sound was worse than a normal							
	telephone channel, and the							
	video was very faulty							
17:40	Preparation for the connection	10						•
	with Canada	mins						
17:50	Canada: "ATM over Satellite"							
18:07	Questions (nobody)							
18:10	Site visits for the comments							
	- Berlin							
	- Brussels: had a question for							
	Canada							
	- Canada: replied to Brussels							
	- Aveiro: lots of problems in							
	the morning but the afternoon							
	went well							
18:15	END OF THURSDAY							

Hour	Activity/Comments	Time	Clip ping	ISDN	Sound Fault	Local Sound Fault	Echo	Image Delay	Sound connec	Search ing icons	Image Fault	Frozen Image	Wrong big window	Prog. Chage	Co-ord Fault
	FRIDAY MORNING 12/7/96														
9:00	Had to do a "cold boot". It postponed all														•
9:25	Moderated in Brussels - Naples: "Torino 2000"		•	•				•							
9:45 9:47	Questions (Naples) - Naples: "Future regulartory env."		•	•				•							
10:05	Questions (Brussels, Berlin)(image delay)	2 sec	•	•				•							
10:15	Sound returned on the ATM Naples then had enough clipping		•												
10:20	Control to Madrid Moderated in Aveiro - Aveiro: "Telecoms and IT" Had no slides		•												•
10:35	Questions (none) Control passed to Madrid Demonstration: 9 windows with the letters "ABC'96 OK!" Very good														
10:40	BREAK rearranged the system														
11:25	No sound in Madrid Break in the ATM connection with Brussels				•	•					•				
11:30	Were going to establish a connection by ISDN but then the ATM connection returned														

11:35	 Madrid: "Advanced Comms. and the Media" Used the document camera Image very small. Recommend always use the GUI. Had no slides Final show of the graphical interface. Visit to all sites for an instant evaluation of the summer school. Marks out of 10 Torino 8, TID 8, Iceland 7, Naples 7, CERN 8, Berlin 7.93, Stockholm 7, KPN 7, Oslo 7, Aveiro 8, Canada 10, Brussels 7, Austria 7. 							•	
12:10	Connection with Aveiro								
12:15	Connection with Brussels. Image Delay	4 sec			•				
12:23	Madrid: "Final View of the Summer School" Visit to main sites: Berlin, Brussels, Aveiro, Naples								
12:30	9 windows on the screen. They disappeared one at a time. Very good								
12:31	FINAL								