The 3rd International Conference on e-Learning
ICEL 2011, 23-24 November 2011, Bandung, Indonesia

Video Conference: Integrated Tool for Identifying CSF in Education Development in UiTM

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Abstract

The purpose of this research is to explain and describe video conference technology (An integrated tool for identifying education development), propose a framework for conversational system, and also will provide information about using Video Conference technology in Centre for Strategic Planning (CSP), UiTM. It is based on material from random groups from the University Technology MARA (UiTM), and in-depth from a mixture of CSP (Center for Strategic Planning) staff department, UiTM Lecturer, and students. Based on literature review, research instrument was layout and designed. There were three attitude categories in the questionnaire. Those categories were effective using of video conference, ways of using videoconference technology, and proposing a framework for conversational system. Several factors were found to be critical to video conference implementation success. The factors are critical preparation, site logistics, equipment, microphone issues, leadership, timing, improve of interpersonal skills, student contact, difference in teaching skills, and training. This research will provide the benefits of using videoconference, the ways of using it, and also will propose a framework for video conference as an integrated tool for identifying education development in UiTM. Also it will be of interest to organizations looking to implement videoconference system. The results provided can be used as references for organizations and universities in general to support their decision making processes concerning the implementation of video conference system.

Keywords: E-learning; Online distance education; Video conference system; critical success factor

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1. Introduction

The distance education traditionally, information sharing among university members has relied on a range of printed materials. Computer technology created opportunities on university campuses for sharing data and information among the staff and the students, and has been deployed since the late fifties (Sullivan, 1996). Online education has come to dominate the strategic thinking of both institutions and Governments over the past decade. This has been driven by the perception that increased use of technology will improve the quality and flexibility of learning (Bush, 1945; Ryan, 2000; Bates, 2001; Cuban, 2001; DfES, 2003; Oppenheimer, 2003).

Videoconferencing is a part of online distance education system; it is a communications medium variously used for lectures, tutorials, students, project reviews, remote visits, etc. A videoconference can be either point-to- point or multipoint, linking three or more sites with sound and video in real time. Multipoint conferences are technically more difficult. Videoconference can also include data sharing such as an electronic whiteboard that all participants can draw on, or text based real time (like e-mail but it appears instantly on recipients' screens) ,so that all participants can work on the same file.

Commercial companies are now advertising "videoconferencing: as a new technology. The fact is that videoconferencing is a purpose which can be hosted on a variety of technologies and has been for some years. It is not a technology in itself. However, the term is applied to a wide range of situations from live video lecturing to large audiences, to a point-to-point, individual-to-individual desktop PC chats. One possible categorization is into large scale and slight degree. The majority of large scale set-ups are currently satellite-based in the form of "interactive video television", one-way video, two-way audio. This allows for broadcast from a central point to many different locations regardless of distance. Video conferencing has great possible for learning in Higher Education. The possible lies in creating greater opportunity for dialogue which facilitates more effective learning than working in isolation.

Conversation may be between lecturers and students or amongst lecturers. However, the success of video conferencing may well be dependent on factors other than the technology. These factors range from educational issues, to student and lecturer attitude to the technology. It is also highly dependent on the teaching methods adopted. There are many unanswered questions from an educational and psychological perspective.

The technology is in a transitional state and many may feel it is currently unsuitable for education. This makes video conferencing highly challenging and exciting to some and a nightmare to others. The scope of this research is limited to UiTM; it will explain and describe video conference technology (An integrated tool for identifying education development), propose a framework for conversational system, and also will provide information about using Video Conference technology in Centre for Strategic Planning (CSP) UiTM.

The objective of this research paper is:

- To encourage community inclusion in university activities by providing access to educational resources via videoconferencing.
- To propose a framework for video conference as an integrated tool for identifying education development in UiTM.
- To support lecturers in transforming their knowledge and to help students to become more active learners.

1.1 UiTM Strategy and Objectives in e-Learning

This research found that UiTM has a professional planning strategy to develop education by using IT technology. UiTM Strategy and Objectives in e-Learning are illustrated below:
- To provide students with a conducive learning environment supported by a professional workforce and innovative learning methods incorporating the latest technologies.
- To strengthen national and international linkages through robust research and academic collaboration.
- To- Enhance and support an effective teaching-learning environment by establishing and maintaining the flexibility required to respond to changes in institutional needs.
- To- Enhance and support the teaching-learning environment through professional planning processes directed at future institutional requirements.
- To- Implement activities which will result in enhanced IT-based learning environments.
- To- Enhance and support the teaching-learning environment by creating facilities for extending
- learning opportunities beyond the traditional classroom.

1.2 Benefits of Videoconference:

Campus based uses

1. Guest speakers can be invited to add quality and diversity to campus-based activities.
2. Small cohort tutorials and seminars can be enriched with input from students at different sites.
3. Share teaching sessions between outreach centers or associate institutions.
4. Inter institutional collaboration: students from different Institutions can use videoconferencing to work on tasks together.

Off-campus uses

1. Non-traditional learners, who may live near a campus or learning centre but not be able to attend campus-based meeting, can use desktop videoconferencing to interact with teaching staff.
2. Geographically isolated learners find videoconferencing invaluable.
3. Vicarious attendance - some operating theatres now have videoconference technology. Students can get the same view as the surgeon during keyhole surgery and may be able to ask questions during the process.
4. Links with industry: Work based learners, students on placement, and Teaching Company can be supported using videoconference facilities in the work place.

2. Literature Review

Videoconferencing is a relatively new teaching and learning innovation. Greenberg (2004) suggested that "videoconferencing-based distance education has been in the early adoption phase for 15 years or more" (p. 9). During the early stages of technology implementation, the bulk of scholarly writing "consists of anecdotal reports, project descriptions, and informal case studies" (Anderson & Rourke, 2005, p. 3). This concern caused Anderson and Rourke to conduct a comprehensive review of the literature on videoconferencing; literature published from 1991 to 2004. Their review includes 53 peer-reviewed, empirical reports, and "provides a survey of topics that are recurrent in the literature, including: (a) outcomes, (b) learning activities, (c) interactive learning processes, (d) keys to success, (e) special populations, and (f) equipment and technology" (p. 3). In the outcomes section, Anderson and Rourke

found that the research focuses largely on student achievement and attitudes, with generally positive findings. Learning activities for rural and remote schools tended towards content delivery, while learning activities for more urban schools primarily used videoconferencing for virtual field trips, collaborative projects, and cross-cultural exchanges. Anderson and Rourke expressed concerns that the measurement tools on interactive learning processes in other learning environments are not used in most of the videoconferencing literature focusing on participation, interaction, and collaboration. The keys to success found in their literature review emphasized support in the technical, pedagogical, administrative, and financial areas. Several of the reports included in their literature review found that videoconferencing was used to bring opportunities to special populations. Technology and equipment are not often mentioned in the research reviewed by Andreson and Rourke, but when they are mentioned, the comments are generally negative relating to equipment failure and the need for more technical assistance. Greenberg (2004), in his white-paper summary of recent research on videoconferencing, described four major conclusions: (a) videoconferencing is likely neither more nor less effective than the traditional classroom, (b) interactivity is key, (c) other instructional strategies maximize the use of videoconferencing, and (d) videoconferencing is cost effective. He stated that further research, both qualitative and quantitative, needs to examine economic implications and deeper understandings of the causes of failure. Owston (2007) developed a model for sustainability of classroom innovations using technology. His model emerged from an examination of 59 schools in 28 countries. The model describes essential conditions such as teacher professional development, and teacher perceived value of the innovation and contributing factors such as funding, supportive plans, and innovation champions. These three reviews and reports provide a framework for interpreting the results of our study.

E-learning, one of the tools emerged from information technology, has been integrated in many university programs. There are several factors that need to be considered while developing or implementing university curriculums that offer e-learning based courses (Hassan M. Selim, 2005). This paper is intended to specify e-learning critical success factors (CSFs) as perceived by university.

Critical success factors were initially proposed by Daniel (1961) and popularized within the discipline of information systems by Rockart (1979). However, in recent years, the CSF approach has been widely adopted and applied to a variety of disciplines as a means of verifying those elements of enterprise success that stand out as being of the utmost importance. Easingwood and Storey (1991, 1993), for example, employed the CSF approach to the appraisal of those factors influencing enterprises' adoption of new financial services. In the case of enterprise mobilization, the appropriate definition and description of the CSFs involved will clearly contribute to the success of mobilization implementation. As Rockart (1979) noted, if these CSFs are met, then it will become feasible for an enterprise to enhance its overall operational results and ensure a successful competitive edge for the future. This study therefore adopts the CSF approach in its investigation of the relationship between two dependant variables, "CSFs" and "successful mobilization".

3. Methodology

An investigation method was applied to this research. Based on literature review, research instrument was layout and designed. There were three attitude categories in the questionnaire. Those categories were effective using of videoconference, ways of using videoconference technology, and propose a framework for conversational system. Questionnaires were delivered to random sampled of CSP (Center for Strategic Planning), UiTM staff, UiTM Lecturer, and students for collecting data. They were asked to mark a Likert scale from "Strongly Disagree" to "Strong Agree". One hundred twenty (120) set of questionnaires were distributed, seventy two (72) set of the questionnaires were returned. The data collected were analyzed using statistical package for the Social Science Software (SPSS version 16). According to the

result of statistical analysis, the CSP (Center for Strategic Planning), UiTM staff's, UiTM lecturer and students attitude toward videoconference applied in education was concluded and discussed. Based on the results general suggestions were recommended to integrate tools for identifying education development in UiTM.

The conversational framework

There are a number of key characteristics of the conversational model as applied to academic learning, drawn from Laurillard, (1993, pp.94-95). This model elaborates on Pask and Scott's Conversation Theory (refs) to emphasize the importance of dialogue in effective academic learning. Laurillard argues that the nature of much academic learning is largely defined by the acquisition of complex concepts and the creation of conceptual distinctions. This cannot be achieved by a pedagogy based around the one-way presentation of content; there needs to be a two-way discussion between lecturer and student at the level of conceptions. According to the conversational model this discussion is central to academic learning. The process of learning is supported by the creation of interactive 'micro-worlds' (learning activities) in which the student can actively engage in practice that enhances and reinforces the ideas that have been formulated through discussion. The model emphasizes that these activities should be created and adapted on the basis of the conceptual discussion, rather than pre-set in advance. The final key aspect of the model is that opportunity for reflection is provided as part of the teaching and learning.

The primary workflow actions that take place through the interactive medium are as follows:
1. Lecturer presents / re-describes conception
2. Student presents / re-describes conception
3. Lecturer sets up micro-world activities
4. Student interacts with micro-world activities
5. The system provides feedback on the action
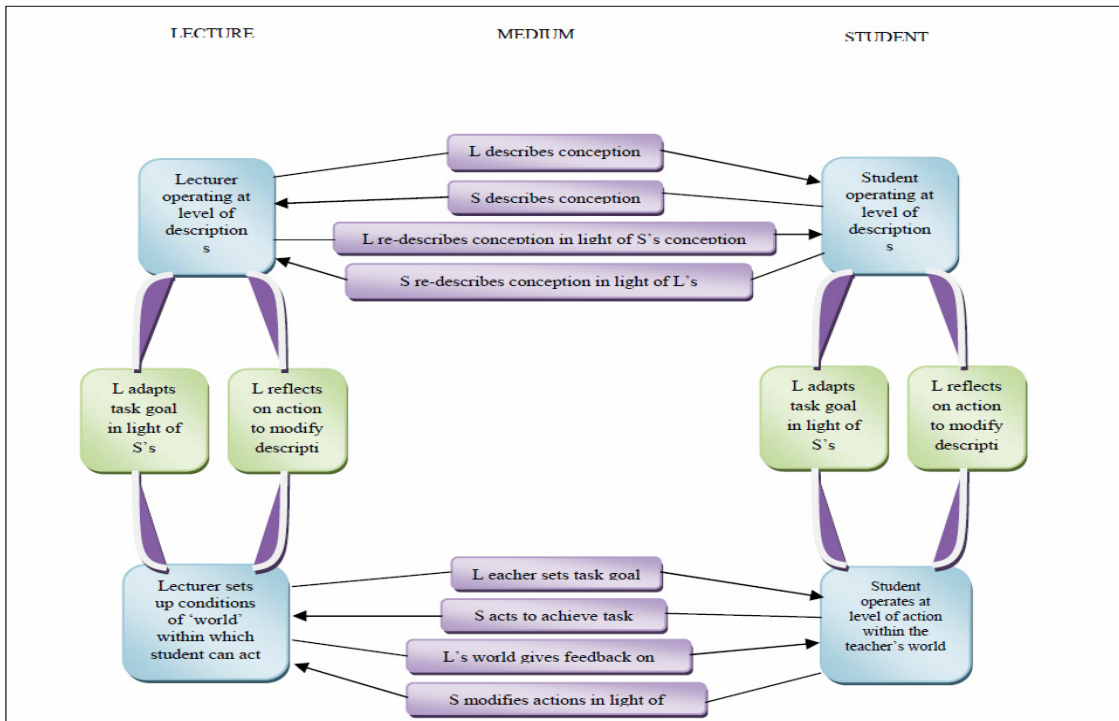6. Student modifies actions in light of feedback

Figure 1: The conversational Framework Source: Laurillard, (1993, pp.94-95)

4. Findings and Results

This research highlights the CSF's for Video conferencing technology, and these factors should be applied in UiTM to ensure Video conference implementation success.

4.1 Critical Factors for success in video conferencing

Critical success factors (CSFs) was first introduced in 1979. The CSFs approach has been used by managers as a framework for strategic planning to direct them in determining those elements that must go right to succeed in achieving goals and objectives. The CSFs method has three steps:

- Listing the goals and objectives,
- Identifying the CSFs necessary to achieve the goals and objectives
- Suggesting ways in which the CSFs are to be measured

Through carrying out the research for this work, and taking part in a number of video conferencing scenarios, a number of critical factors have been identified. These factors are listed below:

a) Critical preparation

1. Regard as whether a pre-course face to face meeting is important to establish good interaction.
2. Prepare students to understand that this is new technology, special challenges in video conferencing.
3. Lecturers must take more preparation time, pre-distributing and educational preparation time

b) Site logistics: Consider the number of sites and the number of participants at each site.

c) Equipment:

1. Speakers should be high quality.
2. Inter-communication delay should be minimized.
3. Students did not like push-button microphones.

d) Leadership

- All the sites and participants the greater the need for supervisor leadership.
- Time management creates a professional respectful impression.

e) Timing

- Make the first session an orientation session.
- 60 minutes for each class. and have break 15 minutes

f) Interpersonal skills: gathering up student profiles - personalities and individual needs is more difficult at a distance. Lecturers should try to get to know students at the beginning, could introduce each other, send photo at beginning.

g) Student contact: Arrange for times to chat individually with the lecturer especially about projects.

h) Teaching skills

- Group and individual projects with the students controlling the video conferencing can be useful.
- The effective style of presentation is conversation. Not to lecture at the students but to encourage active participation.

i) Training

- Video conferencing can be challenging for the lecturers. It may verify harder for them to get contribution from students, strategies must be developed to encourage student contributions
- Encourage staff to develop them self
- Students must not be worried to interact feel they need more training especially in using the camera and microphone.

4.2 Results analysis

According to the respondent's result it could be seen that the majority of the respondents (88%) strongly agreed that the leadership is the most important CSf to ensure video conferencing implementation success , this was followed by the interpersonal skills were (87%) agreed that this factor was extremely important, while the training factor received the lowest percentage with only (30%) of the respondents who agreed that this factor was extremely important in video conferencing for educational development in UiTM. Figure 2 shows the percentage of the respondent's agreement on the CSF of video conference technology to ensure implementation success in UiTM.
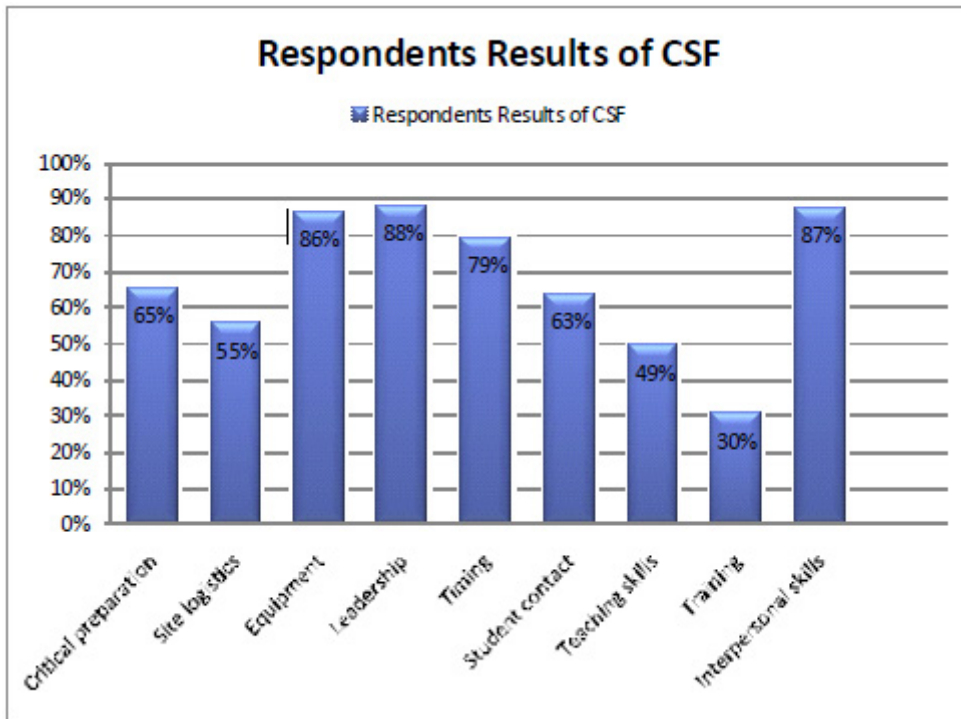

Figure 2: shows the percentage of the respondent's agreement on the CSF of video conference technology to ensure implementation success in UiTM

Based on these results some recommendations were suggested to ensure Video conference implementation success in UiTM.

5. Recommendations for success implementations of videoconference in UiTM:

a) Room design

A desk or conference table arrangement is used normally for one to one and small cohort meetings. Facing the camera. This arrangement works only if there is just one row of people per site because the people in the same room tend to turn round to speak directly to the others around them. Otherwise, participants may sit round the table in a horseshoe with the camera/ screen situated at one end. The chair is normally at the table end farthest from the camera. Seating in rows is normally used for larger cohorts,

but participants in the rows further back have to speak to the backs of the heads of those sitting in front, as in a lecture theatre. Camera and screen have to be mounted higher so that the front row does not block the view of people sitting behind or the seats have to be raked.

Things to avoid: A central aisle, because it divides the audience visually and makes it more difficult to direct the cameras.

b) Cameras

Perfectly should set up is 3 cameras, one each for the audience, the presenter and documents, models, specimens, etc. Cameras should have pan, tilt and zoom to give emphasis to the speakers. Normally an infra red remote control for cameras operated from a keypad, automatic 7 focus and camera position presets for preference, to minimize the amount of camera operation required.

Things to avoid: Zooming unnecessarily because it severely the picture frame rate and hence quality.

c) Audio

One microphone is usually not enough. Alternatives are:

- Multiple desk mounted goose necks (directional)
- Multiple desk mounted boundary microphones (Omni-directional)
- Multiple ceiling mounted goosenecks
- Ceiling mounted boundary microphones.

Ceiling microphones have to be more sensitive because they are mounted further away and therefore pick up more background noise. Gated microphones give right of way to the loudest signal (nearest/loudest person) and switch off the rest of the microphones on the system. Open microphones are all live all the time, so they need to be balanced positional or via a mixer to ensure that they don't give preference to a particular area, e.g. the back row in a tiered lecture theatre would be unusually close to ceiling microphones and thus more audible than those at the front.

Things to avoid: Hard surfaces which cause echoes, noisy heating and ventilation systems. d) Screens

Present of graphical information to large numbers of people in teaching/training presentations, it is very important to maximize screen size. A good rule of browse is that that the maximum viewing distance should be no more than 6 times the diagonal dimension of the screen. The maximum size of monitors is only 46", beyond this, projection systems or repeat monitors have to be used. Repeat monitors are cheaper but it is impossible to arrange the sight lines so that 8 the whole audience is facing the main camera.

Things to avoid: High brightness projection screens, because they need to be viewed from more or less straight on as the image fades rapidly if viewed at an angle.

e) Lighting

Views vary on the most effective kind of lighting. Some suppliers recommend up lighters, while others favour shining down lighters with 45- degree baffles towards the back of the room. Up lighters give more light. Lights should be evenly spaced and if the room contains raked seating, the lighting at the front should be stronger because the seats are farther away from the lamps than in the raised back rows. The

precise number and positioning is best determined by trial and error, but normal office lighting levels of around 500 lux are acceptable, using intermediate or warm fluorescent tubes.

Things to avoid: Mixed lighting types in the same room, i.e. daylight (blue), tungsten (yellow) and fluorescent (green) sources because it distorts the colour balance. Avoid shadows on faces by lighting from slightly in front. Sunlight through windows can upset camera settings and make screens hard to view.

f) Furniture and fittings

Desktops should be as light as possible, but not white to avoid glare. Light colours reflect light up under the faces of participants and soften the shadows under chins, noses. Carpeting is preferable to reduce sound. Dark colours don't matter because they are usually not in camera. A sign in camera view identifying the site is helpful for remote viewers, especially in multipoint conferences. Signs need to be large enough to be readable but not so large as to distract from the speakers. A wall mounted sign for wide angle room views, with lettering about 150mm tall and a desk mounted sign for close up presenter to camera shots; with lettering about 40mm high is a good combination. A large wall clock in view of the presenter is a useful aid.

Things to avoid: Bright, shiny surfaces, hard surfaces, strong bright colours, strong patterns. g) Lesson design

Videoconference events need a high degree of concentration, which is difficult to sustain. Design for interaction by planning events with a diversity of short components, interchanging between presentations and student activities. Allowing a maximum of 15-20 minutes talking before including a student centred activity helps structure the learning experience and gives the presenter of the session a break.

h) Cost

Videoconference sessions can be expensive. Try 9 Video Conferencing to create pre-activities and post- activities that will minimize the amount of time you spend online and maximize its helpfulness. Pre-activities such as reading or prepare work can speed up the session and improve its dynamics. Knowing that there will be follow-up activities encourages participants to maintain concentration.

i) Materials

Of general expenses should not contain too much information because they will become impossible and the audience will take too long to read them. The recommended minimum letter size for A4 documents is 24 point. Use lower case to maximize legibility. Use land-scape format to mimic the screen layout and leave a safe border around the edge If you use the 'reveal' technique with OHP slides, allow for the fact that each reveal will be transmitted as a still by the system, taking about 5 seconds to gather and transmit. Reveals any quicker than this can result in unclear images

j) Computers

People tend to lose interest rapidly in presentations if they cannot also see the speaker at common intervals. Moving essentials in PowerPoint type presentations, such as flying text, dissolves, are transmitted as live action; therefore the speaker cannot be seen, so keep the moving effects to a minimum.

k) Video

Movement slows the frame rate and becomes unclear, so minimize movement as far as possible.

l) Notes

Most lecture notes must be sent in advance for distribution to the audience in readiness for the videoconference session. However students who have read notes in advance find it more difficult to pay attention during the session. A useful technique is to photocopy notes with key points blanked out by Post-It notes. During the session the presenter can remove the Post-It stickers under the document camera thus revealing the key information at the appropriate moment. It also reduces the amount of data that has to be compressed and transmitted, resulting in a better quality picture.

m) Preparation

A lesson plan that maximizes the interactions between individuals and cohort at both ends, which is varied, and which gives you plenty of opportunities to take a break from the camera. Make sure you have a point of contact at the far end, they may be another lecture, class representative or technician but they will act as remote facilitator. Make sure you have their E-mail address and telephone number. Make sure you have the remote site telephone number for making the link. Obtain lists of participants' names in advance. Send important notes in advance. E.g.: (Pre-reading, Work sheets, Key slides, Summaries, Complex images, Detailed text, Further reading, Your photo).

6. Conclusion

Videoconferencing systems can have an important role to play in gathering staff and students across different institutions, bringing in outside experts from industry and reaching and supporting remote students, either in the local community or those overseas. In particular they can be used to aid widening participation and enhancing retention rates through better support for off campus learners and assist with increasing overseas market share. Successful videoconferencing depends on a number of critical success factors:

- Facilities must be easy to use without needing support from technical staff. Standard equipment helps to make conferences easier to set up and more robust in operation. Equipment must be easily accessible.
- Local arrangements for booking and gaining access to equipment can make all the difference to usage.
- Communication technologies work well together.
- A successful recipe for flexibility is to use email (to arrange the meeting, and to hold preliminary discussions); web site (to publicize papers beforehand, and minutes and slides afterwards); discussion board, chat room, or email list (to continue the discussions).
- The audio visual (AV) environment is critical.
- Rooms used for videoconferencing should be configured and furnished appropriately to establish agreed standards of lighting, and audio.
- Local campus LANs may need to be reconfigured to support good access to network-based videoconferencing.
- Staff training and awareness is essential: for academic staff; IT staff; learning technologists; and administrative staff.

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