

Organising Virtual Conferences

Lessons and Guidelines

RESEARCH REPORT
No. 2, January 2001

Organising Virtual Conferences

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IICD Profile

INTRODUCTION - SOMETHING OLD, SOMETHING NEW

“When you log into an online service, you use new tools for an ancient activity. Even with all the screens and wires and chips and lines, it still comes down to people talking to each other”

(Coate, 1998).

This report is about virtual conferences - how to design them to be successful tools for dialogue - how they can help people in far away places talk to each other.

After a short introduction, the central question addressed is *“What are design guidelines for a successful virtual conference?”* Since not much has yet been written about virtual conferences, lessons from literature in other areas like distance learning and computer mediated communication were used to define guidelines for virtual conferencing. These guidelines were based on three factors - participants, organisation, and product (see figure 1.1). These were tested in a virtual conference held in late 1999 and entitled 'Learn to Build a Brighter Future.'

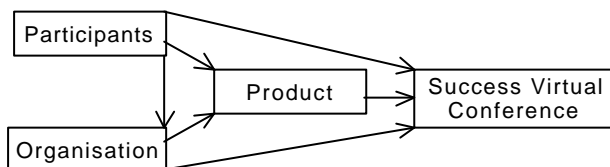


Figure 1.1: Success factors for a virtual conference

After the virtual conference was implemented, the factors influencing the success of the conference were identified. In the course of this evaluation, the guidelines were revised. The final chapter presents the main conclusions and recommendations of the research.

Defining Virtual Conferences

What is a virtual conference? The WWWebster Dictionary defines a conference as a:

1. Meeting of two or more persons to discuss matters of common concern;
2. Usually with a formal interchange of views: consultation, or;
3. Meeting of members of the two branches of a legislature to adjust differences.

There are many definitions of the word 'virtual'. Hiltz (1994) for instance says: “the term 'virtual' is used in computer science to refer to something whose existence is simulated with software rather than actually existing in hardware or some other physical form”. The Oxford desk dictionary suggests that 'virtual' means 'not real'; it is also said that the term virtual is popular among computer scientists and then it means 'generated by computer software'.

From this point of view, a virtual conference is 'a meeting facilitated by computer software'. Since this is a very general description, the term will be studied more deeply below.

In literature many different terms like web, online, electronic, and computer conference exist for expressing the same concept. But what exactly is meant? As there are different terms there are also different definitions. Most definitions include key terms like communication medium, central location, accessible at any time, participants, and written messages.

One of the characteristics of the Internet is that it is accessible at any time. Most definitions mention text-based messages as the actual medium. In order to get to know other participants and create commitment, other media like photos are important. With growth in bandwidth, media like audio and video have increasing importance in virtual conferencing (Woolley, 1998).

All the previous terms concern the instrument through which the communication takes place. But a virtual conference is not only about the instruments: It should be seen in a much broader context, including the participants and the way the whole set of activities is organised. What is a virtual conference without participants? The participants make a virtual conference a success or a failure. This is why a virtual conference should be organised in a way that motivates the participants.

This leads us to the following definition used in this research:

"A virtual conference is an activity, organised in a way that participants can meet and discuss themes of common interest through the use of communication tools at a central location on the Internet."

A virtual conference has both advantages and disadvantages compared to a live conference. One of the advantages is to save on travel costs: Virtual conferencing can be a cost-effective way to bring together a group of geographically dispersed people (Green, 1998). Another advantage is that virtual conferences allow people to come in and out of the conference, and still catch up with the proceedings. In face-to-face meetings people check in and out (either mentally or physically), but are unable to recapture what has transpired in their absence (Green, 1998). At the same time, this is also a disadvantage since it is hard to establish and maintain group synergy with people coming on- and offline at random.

Since participants have no physical presence, they are free of some of the stereotypes that can hinder communication. They are more likely to assess others on what they say rather than on their age, race or physical condition. Ideas have a greater chance of standing or falling on their own merit. This can be especially beneficial in cases where hierarchy may jeopardise a solid exchange of ideas (Green, 1998). In asynchronous systems participants have the time to review previous messages, check references, compose messages, and they can participate in local time (Green, 1998). In comparison to telephone and fax, an advantage of virtual conferences is that sending a message to a group of people is no more complicated than sending a message to one person, which creates better opportunities for one-to-many and many-to-many communication (Hoogendoorn, 1998).

Virtual conferencing also has disadvantages. Even though there are several ways to integrate multimedia in virtual conferences, most virtual conferences are restricted to text communications.

Communication without the visual or auditory cues that form 70% of face-to-face communication does not come naturally to most people (Mason, 1994) and some may have difficulty with their level of written literacy (Green, 1998). Besides, once a message is written, it is very definite. People can always point at what you have written, which may cause some barriers for sending messages. Ironically one of the benefits of online conferencing - flexibility of access - becomes a liability if you are trying to get people to move to a more profound analysis of a topic. In face-to-face meetings, you can always 'lock' people in a room to get them to focus on an issue. Online conferencing allows people to take a coffee break whenever the going gets tough (Green, 1998).

In short, a virtual conference is a relatively good medium to get people who are dispersed in time and space together to discuss themes of common interest. But much effort is needed to get participants committed in order to achieve the objectives and have a successful conference.

Problem Description

As concluded above, a virtual conference is a relatively good medium if it is well organised and designed. To determine what is meant by 'well organised and designed', research was carried out as part of the virtual conference 'Learn to Build a Brighter Future' initiated by the International Institute for Communication and Development (IICD).

The virtual conference 'Learn to Build a Brighter Future', which took place from September 20th until November 5th 1999, addressed the question: "How can ICT help to build the capacity to train and educate in developing countries?" Much effort was put into getting participants deeply committed, to ensure that they were willing to spend time and energy needed to participate effectively.

In this report, the answer to the central question - how to set up a successful virtual conference - will be given in the format of guidelines based around three factors - participants, organisation, and product.

Since participants can make a virtual conference into a success or a failure, the product and organisation factors were adapted to the participants' characteristics in order to get them as motivated as possible. Since communication in virtual conferences sometimes is sluggish compared to face-to-face meetings, special attention is paid to the role of the moderator, the discussion leader in virtual conferences.

In terms of product, it comes to a communication design problem. De Vries & Verhagen (1997) define a communication design problem as an internal or external communication problem of an organisation, which is expected to be solvable by the design of an acceptable communication product. The communication product in this context is a virtual conference environment.

GUIDELINES FOR A VIRTUAL CONFERENCE

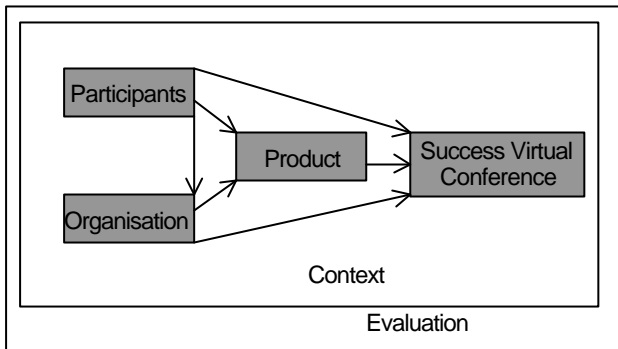


Figure 2.1: Focus on guidelines for factors within the conceptual model of a virtual conference

Introduction

A virtual conference is defined as “an activity, organised in a way that participants can meet and discuss themes of common interest through the use of communication tools at a central location on the Internet.” Based on this definition, three factors can be distinguished that influence the success of a virtual conference. These factors are visualised in Figure 2.1, the conceptual model of a virtual conference.

The factor ‘participants’ is obvious; it is worse to have a virtual conference without participants than not having a virtual conference at all. Therefore, effort should be put into getting participants committed. The term ‘organised’ concerns design decisions such as timeframe, size and roles. The term ‘central location on the Internet’ is the virtual conference environment, referred to in this report as product.

The factor organisation should be adapted to the participants’ characteristics. The factors organisation and participants influence the success through the product. This means that the virtual conference can only be successful if the virtual conference environment is adapted to the participants and the organisation. All three factors independently also influence the success of the virtual conference.

Knowledge of virtual conferences was collected by means of a literature study and a comparison of existing conferencing systems. For all three factors, the design guidelines are defined. These guidelines are not all-inclusive but they give a direction for designing a virtual conference.

Successful Virtual Conference

The depending factor distinguished in the conceptual model of a virtual conference is success. An important question that arises is, of course, the question what is success and when is a virtual conference successful? In general, a virtual conference is successful when the objectives of both the organisers and participants have been achieved. In this research, success is represented by the participation rate, the number of messages sent by participants.

Participants of a Virtual Conference

As was stated before, the participants are crucial for the success of a virtual conference. Hiltz (1994) looked at students' characteristics as predictors of the success of an online course. Since virtual conferencing and the virtual classroom are methodologically alike, but differ in target group, most of the defined predictors can be used in this research as well. Hiltz (1994) defines pre-expectations, student maturity and ability, group community, and attitude towards computers in general, as crucial predictors of success. Next to the predictors extracted from research in the area of distance learning, Lyndsey Green (1998) identifies important factors related to the group's composition that will affect the virtual conference: specifically ease of social/technical access, perceptions of fellow participants, previous history and motivation.

In virtual conferences with international participants, language and cultural aspects are also important. In addition, the success of the conference depends on the time the participants invest, which partly depends on the time they have available. The attitude of the participants depends on the design and relevance of the virtual conference, but also on their individual characteristics. For that reason, the sub-factors of participants are subdivided in design factors and requirements. This subdivision does not completely cover the distinction between the factors, as there are factors that fit in both categories. For example, participant technology is a factor for which a minimal requirement should be formulated, but it is also a factor that should be taken into account during the design process. The first set of sub-factors in Figure 2.2 involves the design factors and the second set contains the requirements.

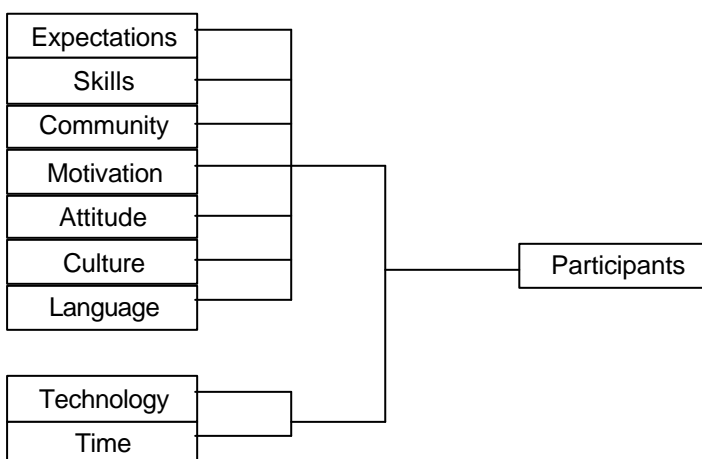


Figure 2.2: Characteristics of Participants

Design Factors

The principle in this research is that participants have characteristics that should be taken into account during the design of the virtual conference. These characteristics are referred to as design factors, meaning that these factors should be taken into account during the design process of organisation and product.

Pre-expectations become self-fulfilling prophecies. This has proven to be true in other studies of computer mediated communication - CMC (see Rice & Case, 1983; Hiltz & Johnson, 1990). When participants have high expectations of the virtual conference, they will be more likely to spend time on making it successful.

Sufficient skills like computer skills and literacy are needed to handle the technology and the tasks (Green, 1998) of virtual conferencing. If participants do not have the skills, energy will be diverted from the actual discussion. In the area of distance learning, it was found that the feeling of being part of a community or a group makes it more likely that participants show commitment to that group, thus, the discussion.

Participants' motivation brings the most weight to bear on the outcome of the virtual conference (Green, 1998). Students with more positive pre-course attitudes towards computers and towards the specific system to be used, are more likely to participate online actively and to perceive greater benefits from the virtual classroom mode (Hiltz, 1994).

One of the advantages of the WWW is that people from all over the world can have access. As a result many different cultures come together. A primary difficulty relating to WWW aspects is therefore that one must be alert to the fact that a WWW environment emphasising user choice may not be consistent with, for example, a hierarchically oriented culture (Collis & Remmers, 1996). In virtual conferences the design should take these differences into account and rules should be offered in terms of social behaviour.

Writing in a second language can be a barrier to participation. Barriers will be reduced when participants can send messages in their own language, for translation if necessary.

Adjust the organisation of the virtual conference and the virtual conference environment to the identified design factors

Requirements

Even though the principle is to give the participants a central position in the virtual conference, it is impossible to organise a virtual conference if participants do not meet minimal requirements. Therefore, another subdivision, requirements, is defined and describes the factors for which minimal requirements should be made.

Usually there is a difference between a participant's intention and his/her actual behaviour when experiencing barriers. For example, a person may have the intention to participate, but in practice, they do not have the time. In order to prevent this, criteria should be defined beforehand. They should be defined in terms of expected time for participating in the conference.

Bandwidth, browser, and software, all are part of the participant's technology that determines the level of access to a virtual conference. The level of access of the participants is crucial for the success of the conference (Green, 1998). It is useless to build a virtual conference that is inaccessible for some of the participants.

Since the success of the virtual conference depends for a great deal on the participants, a certain level of commitment should be required. The minimum time requirement depends on the timeframe of the virtual conference. The longer the conference takes, the fewer hours per day participants can be asked to spend. The minimum technological requirements depend on the mode of communication. If the virtual conference is web-based, the minimal requirement is access to the WWW otherwise only email is sufficient.

Define minimal requirements of the participants in terms of time and access to technology

Organisation of a Virtual Conference

Here we refer to the processes behind the event. Guidelines for the organisation of a virtual conference concern the decisions that should be made on factors such as those in Figure 2.3.

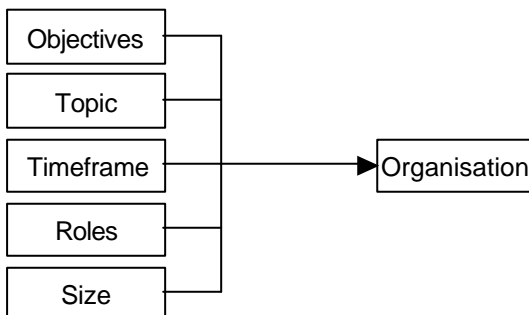


Figure 2.3: Sub-factors of organisation

Objectives

The objectives are very important for organisational decisions that should be made. The objectives of a virtual conference could include cooperation, discussion, decision-making, exchange of information, keeping up to date on new developments, or defining project proposals. Since pre-expectations often become self-fulfilling prophecies (Hiltz, 1994), participants know what to expect if the objectives are clearly formulated. Therefore, it is necessary to begin with clearly defined objectives and to keep them in focus at all stages.

Make clear what the objectives of the virtual conference are and what is expected from the participants

Topic

When a decision is made on the conference subject, the subject should be relevant to the participants' situation and at the appropriate level. If a subject is relevant, the participants are more likely to participate actively. The level of the discussion should be appropriate for the participants. When the level is too high, the participants will be unable to follow the discussion. When the level is too low, it will be of no value for the participants.

Ensure that the subject is relevant to the participants' situation and at the appropriate level

If the conference covers more subjects, it is possible to divide the general subject into more specific ones. Activity variation can extend the attention span of a learner and sustain his/her interest in learning for a longer duration (Madhumita & Kumar, 1995).

Make a division in the conference with the focus on different subjects

Timeframe

The appropriate timeframe of a virtual conference depends on the objectives, the conference design, and the stamina of the participants and moderator. If the conference is organised to accomplish a specific task, it is necessary to set a timeframe that is long enough to accommodate people's professional commitments, and short enough to ensure they will not keep postponing participating. More time will be needed if participants from different time zones are participating (Green, 1998). Depending on the objectives of the conference, for closed asynchronous conferences, a timeframe between one and seven weeks should be appropriate. This gives people enough time for reflective input and to accommodate other commitments. If different subjects should be discussed, it is best to focus on one subject at a time, set a timeframe and close the subject before another subject is started; time constraints encourage synergy (Green, 1998).

Choose a timeframe long enough for reflective input and short enough for keeping the participants motivated

Roles

Roles are patterns of behaviour that distinguish between different activities within the group, and that interrelate to one another for the greater good of the group. Roles may emerge in a group for a number of reasons:

1. They present a division of labour in the group: only in the simplest groups there is no division of labour;
2. They furnish clear-cut social expectations within the group, and information about how members relate to one another, and;
3. They furnish members with a self-definition and a place within the group. Roles emerge to facilitate group functioning (Hogg & Vaughan, 1998).

The moderator, the stimulator, and the lurker are three roles that can be distinguished in virtual conferences. A moderator is a person who leads the virtual discussion and keeps participants engaged. Berge (1995) categorised four conditions for successful online tutoring: pedagogical, social, managerial, and technical. The pedagogical task concerns the duties as an educational facilitator; the social task refers to creating a friendly and social environment; the managerial task involves setting the agenda for the conference; and the technical task has mainly to do with making participants comfortable with the system and the software being used. Also Mason (1994) identifies three roles that computer conferencing moderators must possess:

1. Organisational role;
2. Social role, and;
3. Intellectual role.

These tasks are similar to the tasks identified by Berge (1995), where Mason's description of intellectual task is comparable to Berge's pedagogical task. The pedagogical task is important in online learning rather than in virtual conferences since learning is not usually the main objective of a virtual conference. The technical role is not necessarily done by the moderator, which makes that especially the social and the managerial roles are most important. The most important of our needs are served by communities (Downes, 1998). The theory of group cohesiveness (Festinger, 1950) distinguishes a field of forces, based on group attraction and goal mediation, acts on individual group members to render the group more or less cohesive, and that cohesiveness influences membership continuity, and adherence to group norms. Kimball (1995) mentions 'create an ambience' as one of the ten ways to make online learning groups work.

A stimulator is a person who is like a participant, but has the extra task to keep up the discussion and stimulate other participants to be active. People respond to other people, and you must fund and employ 'online personalities' who appear regularly on your discussion forums (Frentzen, 1998).

A lurker is a person who is participating in a virtual conference by reading other participants' contributions and does not contribute him/herself.

Clearly define roles of a moderator and a stimulator in order to facilitate group functioning

Size

If the conference site is closed, a decision on how many participants to invite should be made. The most appropriate number of participants depends on the objective of the conference. Experiences from the field are that a typical face-to-face classroom (20-25) is appropriate for virtual interactions as well. This is based on a virtual conference with 80 participants who were overwhelmed by the dozens of discussion threads that evolved. Some felt they had to read everything and when they could not keep up, dropped out in frustration (Green, 1998). On the other hand, Collaborate '98, another example of a virtual conference, had about four hundred participants and the participants perceived it as a great success because of the level of interaction between the participants (Collaborate'98).

When deciding on the number of participants, it should be taken into account that not all participants will actively participate. In previous conferences, only twenty percent of the participants posted messages, the remainder used the conference to download documents and read other participants' comments (Green, 1998). In addition, the Ringelmann effect denotes a reduction of individual effort as a function of increasing group size (Hogg & Vaughan, 1998). A follow-up experiment showed that more than half of the reduction is caused by motivation loss. This motivation loss has been termed social loafing by Latané (1979). Since the expected appropriate number of participants mentioned, vary greatly, no concrete guideline can be given. It can only be concluded that it is important to invite extra people to ensure a good number of active participants, and, the larger the group, the more extra participants should be invited.

Take into account that there are always lurkers, so invite more people than are expected to participate

One of the advantages of virtual conferencing is the summary. People may go in and out of the conference and still keep up with the discussion (Mason, 1998). If people go out of the discussion for a long period too much might have happened in the discussion, making it difficult to rejoin. Detailed summaries allow late entrance of intermittent participants to quickly find out what has been said under each topic. She mentions the term 'weaving' as a networking term referring to the process of summarising and synthesising multiple responses in a virtual group. Kimball (1995) states 'Recap by weaving' as one of the ten preconditions for success in online learning groups.

Offer detailed weekly summaries

Product for a Virtual Conference

The product mentioned in this context, is the virtual conference environment. It is a website accessible for all participants at any time, in which different communication media are located. The communication media are the instruments through which the communication process takes place.

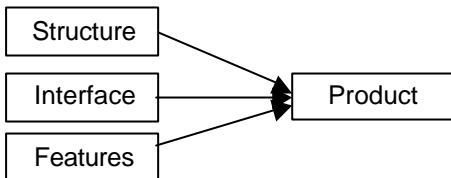


Figure 2.4: Sub-factors of product

Structure of a Virtual Conference Environment

The structure of a web environment is the visible sequence of, and the relationships between the web pages, which together form the web environment or site (Remmers, 1998). It is important to have a suitable structure as this can help or hinder users navigating the environment. Research by Remmers (1998) gives an overview of different web-environment structures. She distinguishes five different structures, namely a linear, a grid, a hierarchical, a web, and an empirical structure. Figure 2.5 presents four of the structures, organised along the axes 'complexity' and 'flexibility'.

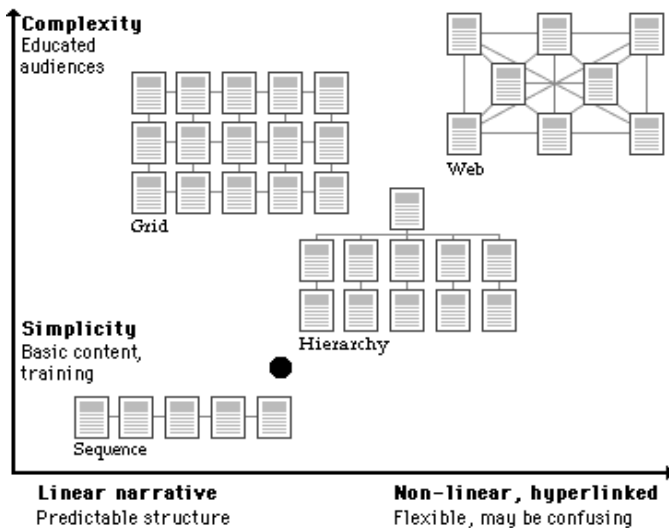


Figure 2.5: Summary of structures of a web environment (Source: Lynch & Horton, 1997)

Based on this study, it can be concluded that an effective way to organise a virtual conference environment is a hierarchical structure since it is possible to divide the content into topics and subtopics, information is complex and structure is clear for participants.

Use a hierarchical structure to organise a virtual conference environment

Interface Design of a Virtual Conference Environment

A user-interface is the totality of surface aspects of a computer system, such as its input and output devices, the information presented to or elicited for the user, feedback presented to the user, the system's behaviour, its documentation and associated training programmes, and the user's actions with respect to these aspects (Preece, 1994). The user-interface is very important for the success of a website and therefore also for a virtual conference. Much research has been done into effective interfaces (see Collis & Winnips, 1998; Park & Hannafin, 1993; Tognazzini, 1999).

Two levels can be distinguished in guidelines: Principles and design rules. Principles are guidelines on a high level and widely applicable; a design rule is an instruction that can be obeyed with minimal interpretation and input required by the designer (Preece, 1994). In this paragraph guidelines are given for the interface of a virtual conference environment on a 'principle level' and with the identified participants' characteristics and organisation decisions as input. The guidelines are partly based on psychological theory and partly on practical experience mentioned in literature.

As stated in the previous paragraph, participants vary greatly in their access to technology. The web is an environment that can be made flexible and can be adjusted to meet participants' needs. Flexibility in interface design is offered by having choices like frames or no frames, graphics or text only (Galitz, 1993). This option should be presented at the website's first page.

A virtual conference environment must be sensitive to the differing needs of its users

Knowledge is best integrated when unfamiliar concepts can be related to familiar concepts (Park & Hannafin, 1993). Through this method – metaphor – the user automatically generates a mental model of a website. The user should be helped to make this model a structured one (Collis & Winnips, 1998). A metaphor could be a useful way to help participants generate a mental model. Examples of appropriate metaphors for a virtual conference environment are the community metaphor (Ishida, 1998) or the metaphor of a physical conference building.

Use familiar metaphors in designing the interface

Learning improves with increases in the number of complementary stimuli used to represent learning content (Park & Hannafin, 1993). Based on this statement Park & Hannafin formulated the following guideline: "Find a variety of ways to represent content to make the learning experience more meaningful and related to the learner's prior knowledge." In addition Wilson & Jonasson (1989) suggest using graphics to represent content interrelationships.

Present information using multiple complementary symbols, formats, and perspectives

In a virtual conference where participants are drawn from all over the world, it should be taken into account that many different cultures may lead to misunderstandings.

Be careful with icons and colour symbolism that may be culturally insensitive (Eekma, 1996)

Features in a Virtual Conference Environment

A comparison of five conference sites has resulted in an overview of possible conference environment feature. It is hard to add a label 'good' or 'bad' to each feature, since the appropriateness depends on the situation. For example, video can be an effective feature, but if bandwidth is a problem for participants, text is much more effective. The features mentioned in this paragraph concern the end-user features and not the system management and administration features. In web-based virtual conferences, every feature serves another goal. Therefore, it is important to identify the goals and then to choose the right feature. For example, if community between participants is required to achieve the objectives, features should be applied that stimulate the forming of a community like background information on the participants.

Use features in the virtual conference site that have an additional contribution to achieving the objectives of the virtual conference

An inventory of features is provided in Table 2.1.

Feature	What is it, and when is it best used?
Email	The major advantage of using email in a web-based virtual conference is that the discussions come to the participants, rather than the participants having to go look for them. Besides, it requires effort to stop receiving messages from an e-mail list. If there is high email traffic, it might be irritating to receive all the messages in their mailbox.
Calendar	A calendar is the schedule of the discussion by date. This calendar can include announcements and special events. An advantage of the calendar is that participants can adjust their individual schedule to match the conference schedule. The upcoming events can be viewed by daily, weekly, and monthly schedules.
Welcome message	There are two kind of welcome messages. First, conference host or administrator welcome messages provide basic tips on using the conference system and posting messages, information about available resources and direct links to those resources, and who to contact for support and how. This message can be sent to the participants by email, but it should also be posted somewhere on the website. For example, a thread should be started especially for technical questions and answers. Second, the moderator should send a welcome message, in which he/she introduces him/herself and makes clear what the objectives are (Boak & Blackburn, 1998).
Guestbook/ personal homepage	If you want to create a community, create a space in the virtual conference site in which participants can get to know each other and communicate with each other. A picture makes participants more familiar to one another, which makes it easier to communicate. A personal homepage for every participant will help make the conference a more social event and thus create a sense of online community.

Resources/ Virtual library	This feature contains relevant background information for the subject of the virtual conference. These resources are presented in the format of books and articles, links to websites, names of experts, or existing projects.
Log-in	The decision as to whether a conference site should be open or closed depends on the objectives. When the site is open, everybody is free to post messages so useful remarks from unexpected corners can show up. However, open sites have a danger that non-committed people mess up the discussion. If you want to create commitment in order to achieve results, it is necessary to define boundaries (Schein, 1988) and close the site.
Site map	A sitemap helps the participants to navigate through the website if the website is large and complicated. From the site map, the page you want to go is only one click away.
Help	A help function provides technical assistance for the participants.
Info slide show	When there is much information the participants should know, an information slide show could be an attractive and effective way to inform the participants.
File sharing	The possibility for participants to share files is especially useful if participants are working together.
Multimedia	The use of computers to present text, graphics, video, animation, and sound in an integrated way for richer interactions.
Chat	Real-time or synchronous communication between two users via computer. Once a chat has been initiated, either user can enter text by typing on the keyboard and the entered text will appear on the other user's monitor.

Table 2.1: End-user features and situations in which they are best used

Bulletin Board

A virtual conference can exist out of many end-user features. Most important are the features of the tool through which the actual communication takes place: The bulletin board. Decisions that should be taken at this point are whether the communication should be synchronous (at the same time) or asynchronous (time independent). In the case of asynchronous communication, participants can post their messages at any time of the day or night. Mason (1998) concludes that the four crucial advantages of the asynchronous media, in descending order of significance:

- *Flexibility*: access to the material (e.g. on the Web, or computer conference discussions) can take place at any time (24 hours of the day, seven days a week) and from many locations;
- *Time to reflect*: rather than having to react 'on one's feet', asynchronous systems allow the user time to mull over ideas, check references, refer back to previous messages and take any amount of time to prepare a comment. In addition asynchronous communication provides great benefits to non-native speakers of English by allowing the user time to read and compose the messages (Ishii, 1993);
- *Situated learning*: because the technology allows access from home and work, the learner can easily integrate the ideas being discussed in the course with his/her working environment, or access resources on the Internet as required on the job, and;
- *Cost-effective technology*: text based asynchronous systems require little bandwidth and low-end computers to operate; thus access, particularly global access, is more equitable.

With synchronous communication everyone can be online, live and at the same time. The four compelling advantages to synchronous systems are:

- *Motivation*: synchronous systems focus the energy of the group, providing motivation to distance learners to keep up with their peers and continue with their studies;
- *Telepresence* is real-time interaction with the opportunity to convey tone and nuance. It helps to develop group cohesion and the sense of being part of a learning community;
- *Good feedback*: synchronous systems provide quick feedback on ideas and support consensus and decision making in group activities, both of which enliven distance education, and;
- *Pacing*: synchronous events encourage students to keep up-to-date with the course and lend discipline to the learning process, which helps people to prioritise their studies.

Asynchronous and synchronous communication can be combined in order to capitalise on the benefits of both (Mason, 1998). Synchronous communication is successful when only a limited number of people is participating.

Combine both asynchronous and synchronous communication to capitalise on the benefits of both

A crucial question in asynchronous virtual conferences is whether the messages should be stored as threads or linearly. What is the difference? A thread is a hierarchical tree structure, where a response can be attached directly to any message. A discussion can potentially branch out infinitely. In linear structures, also known as "comb" or "star" structures, responses are always added to the end of a linear chain of messages. Within a conference, many of these linear discussions can go on in parallel, each about a different topic (Woolley, 1998).

The linear structure is simpler to navigate and more closely resembles face-to-face conversation. In side-by-side comparisons, some conference administrators have found that a linear discussion promotes more activity than a threaded discussion. Nonetheless, many people are familiar with threaded conferences, and feel frustrated with what they view as a lack of flexibility in the linear structure. This has become something of a "religious war", but the truth is that both models have their place (Woolley, 1998).

Threaded structures seem to be better for question-and-answer applications like technical support, while linear structures are more conducive to extended, deep conversation (Woolley, 1998)

Conclusions and Guidelines

To define guidelines for a successful virtual conference, three factors - participants, product, and organisation were identified. These factors and certain sub-factors are visualised in Figure 2.7. Organisation decisions should be based on the participants' characteristics and targeted to committed participants. Features of the product should take into account both organisational decisions and participants' characteristics. All factors have direct influences on the success of the virtual conference.

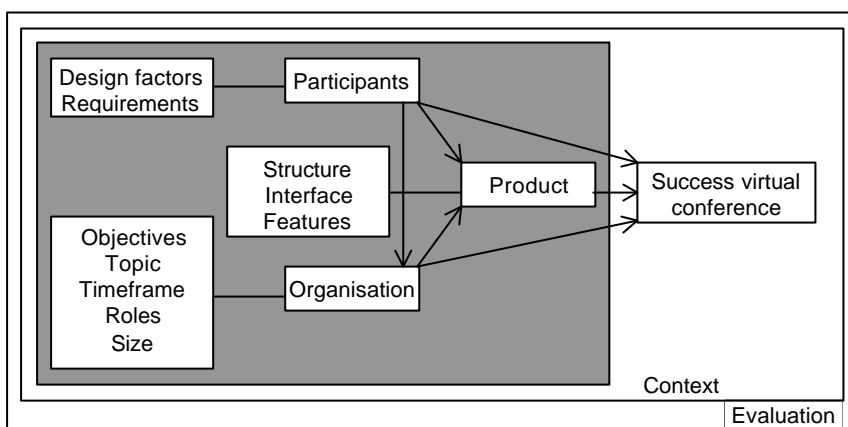


Figure 2.6: Detailed conceptual model of a virtual conference

For most of the factors, guidelines are summarised in Table 2.2.

Guidelines		
Participants	General	
Design factors	Adjust the organisation of the virtual conference and the virtual conference environment to the identified design factors	
Requirements	Define minimal requirements to the participants in terms of time and access to technology	
Organisation	General	Participants
Objectives		Make clear what the objectives of the virtual conference are and what is expected from the participants
Subject	Make a division in the conference with the focus on different subjects	Make sure that the subject is relevant to the participants' situation and at the appropriate level
Size	Take into account that there is always a number of "lurkers" so invite more people than the aimed active number	

Roles	Clearly define roles of a moderator and a stimulator in order to facilitate group functioning	Offer detailed weekly summaries
Timeframe	Choose a timeframe long enough for reflective input and short enough for keeping the participants motivated	
Product	General	Participants
Structure		Use a hierarchical structure to organise a virtual conference environment
Interface	Present information using multiple complementary symbols, formats, and perspectives	Be careful with icons of stereotypes and colour symbolism that may be culturally sensitive (Eekma, 1996)
	Use familiar metaphors in designing the interface	A virtual conference environment must be sensitive to the differing needs of its users
Features	Combine both asynchronous and synchronous communication in order to capitalise on the benefits of both	Threaded structures seem to be better for question-and-answer applications like technical support, while linear structures are more conducive to extended, deep conversation (Woolley, 1998)
		Use features in the virtual conference site that have an additional contribution to achieving the objectives of the virtual conference

Table 2.2: Guidelines for a successful virtual conference

THE 'LEARN TO BUILD A BRIGHTER FUTURE' CONFERENCE

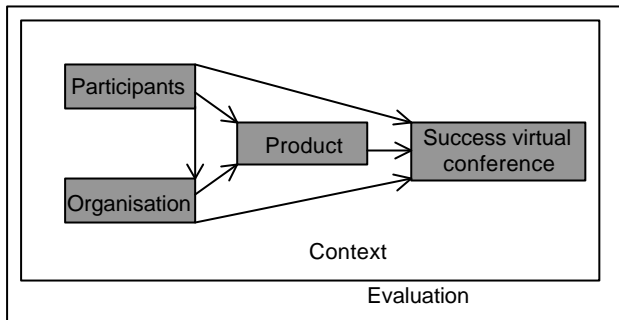


Figure 3.1: Focus on design of factors within conceptual model of a virtual conference

As stated before, a virtual conference is successful if the objectives of both the organisers and the participants have been achieved. In order to determine if 'Learn to Build a Brighter Future' was successful, the results are related to the objectives.

Participants in 'Learn to Build a Brighter Future'

Guideline: Adjust the organisation of the virtual conference and the virtual conference environment to the identified design factors

"Pre-expectations become self-fulfilling prophecies" (Hiltz, 1994). An information slide show and a brochure supplied information about what to expect from the virtual conference. In this way, the participants were helped in forming expectations.

The organisers selected the participants by choosing people who dealt with ICTs and education from their own networks. It was expected that if people were invited personally by someone they know, they would be more motivated. The aimed division of people from developing and developed countries was fifty-fifty. In total 83 participants joined, 51 from developing countries and 32 from developed countries.

In the design process of the virtual conference environment considerable attention was paid to create community in the form of features through which participants easily got to know each other and special attention was paid to what meaning the role of the moderator should have in this process.

Also cultural differences could be a problem in a virtual with international participants. To keep these problems to a minimum netiquettes were encouraged. Netiquette simply is the etiquette of cyberspace: a set of rules for behaving properly online. The netiquette for 'Learn to Build a Brighter Future' are described in Appendix C. This netiquette does not overcome all cultural differences, but it might help a bit because the participants have the same reference frame.

Since people from different countries were participating in the virtual conference, language could be a problem. A translating service could solve this problem, but this feature was beyond the constraints of time and money. In this way the factor language has turned into a factor for which a minimal requirement should be formulated rather than it is a design factor. The decision was made to choose English as a working language since this is mainly the working language between the organising committee members and their partners in foreign countries.

Guideline: Define minimal requirements to the participants in terms of time and access to technology

The minimal requirements for participation were:

1. Access to email;
2. Ability to spend at least one hour a week participating in the virtual conference, and;
3. Ability to speak and write in English.

Besides the minimal requirement for technology, the participants' technology was also taken into account during the design process. This is also referred to as user-centred design. Known about the participants was that 61% lived in developing countries. For this reason the website should be designed in a way that it is quickly loaded. In order to find out more clearly about what exactly the limitations of participants' technologies are, an information page was constructed where participants were informed about the conference by an info-slide show, an online brochure and where people could register online. An invisible tracker named 'The Counter' was placed on this page, so useful information for website design in terms of resolution, browser support, domain, Java status, and colour depth could be gathered. This information did not give a complete overview since not all the participants visited this page and also other interested people who decided not to participate in the virtual conference had visited this site. It did give an indication of what participants had and did not have in terms of hard- and software.

Organisation of 'Learn to Build a Brighter Future'

The conference was divided in two parts. It started with a virtual conference and was concluded during a live conference. The aim of the virtual conference was discussion and dissemination of knowledge and eventually to initialise concrete project proposals. During the live conference, the participants of the project teams came together to finalise the project proposals and make decisions on how to continue with their projects.

The virtual conference

Guideline: Take into account that there are always lurkers, so invite more people than are expected to participate

Concerning the number of participants in the virtual conference, it was not clear what number of participants would give an active, but comprehensible discussion. With the above guideline in mind, 150 participants from the organising committee's network were invited. In the end, 83 participants actually subscribed.

Guideline: Make a division in the conference with the focus on different subjects

The discussion was practically geared to teacher training since it was expected that teacher training in particular was relevant for development in education. The conference organisers saw a clear distinction between secondary and vocational education, and therefore the discussion group was separated in two groups: Teacher Training for Secondary Schools (TTsec) and Teacher Training for Vocational Institutes (TTvoc). The division of the participants is shown in Table 4.1. This division is based on the preference the participants gave at the subscription for the virtual conference. However, even if a participant said to prefer one specific group, it was possible to take part in both.

Participants	Developing countries	Developed countries	Total
Ttsec	31	16	47
Ttvoc	9	9	18
Both groups	11	7	18
Total	51	32	83

Table 3.1: The division of participants in origin and group of preference

Guideline: Choose a timeframe long enough for reflective input and short enough for keeping motivation

Since one of the objectives was to develop project proposals, it was important to have a timeframe that was long enough to come to this result. A period of seven weeks was chosen, which was subdivided in two rounds. In these rounds participants were led from discussions and exchanges of experiences to the joint creation of project ideas. These stages functioned as a funnel in which the conclusions and recommendations of one stage defined the discussion of the next. In this way a common ground could be created for constructive collaboration between participants. During the first round, weeks one to five (from Monday the 20th of September until Friday the 22nd of October), participants discussed the methodology, technology and issues in exchanging expertise, as concerns the use of ICT towards building capacity in education and training. The organisation of Round I in themes is visualised in Figure 3.2.

Round I

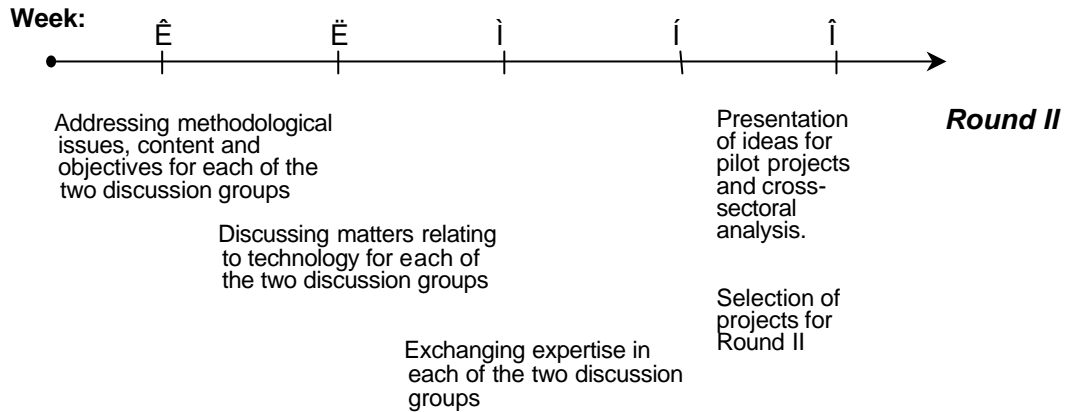


Figure 3.2: Planning for virtual conference Round I

For each discussion group, an internationally renowned expert presented a key paper to ignite the discussion in advance of the conference. Within each discussion group, three topics were discussed. Each topic was dealt with in a period of two weeks. Participants were invited to comment on this paper in a structured way so as to enable common conclusions. There was a moderator for each discussion group. On a weekly basis, the moderator summarised the discussion and invited the participants to share their opinions.

Week five also served to round up the five weeks of discussions by summaries, conclusive statements and recommendations on the various topics. And at the end, possible interesting areas for projects or implementation of ideas raised during the first round of the conference were identified. During this same week of discussions (week five), participants were invited to present ideas for projects, taking into account the results of the discussions of weeks one to five. The outcome of the first discussions, concerning the methodological, technological, and employment possibilities and constraints, formed the framework for the projects.

The participants could vote for the project ideas they preferred. Eventually, four projects were selected for further development during Round II and after the virtual conference. Once the four project ideas were chosen, they were disseminated; accompanied by a 'call for partners' among the other participants. That is, participants were asked to join-up with one or more projects. The initial idea was to form four working groups, two per discussion group, but eventually because of the activity in TTsec and the inactivity in TTvoc, the four working groups were formed out of the TTsec group only. These working groups served as mini-forums to elaborate the plans and discuss possible contributions of each partner in Round II to his/her respective pilot project. The project plans were further developed during a face-to-face meeting at the live conference after Round II of the virtual conference. Building on the findings of the previous discussions, Round II focused on the development of the selected pilot projects per discussion group and took place from Monday the 25th of October to Friday the 5th of November. During this round, participants were divided into four separate working groups — one for each pilot project. Figure 3.3 visualises the planning of virtual conference Round II.

Round II

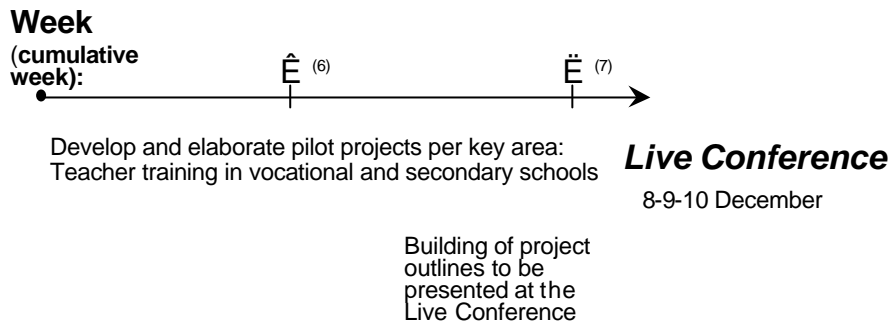


Figure 3.3: Planning for virtual conference Round II

Guideline: Clearly define roles of a moderator and a stimulator in order to facilitate group functioning

In order to get a group of people not knowing each other to cooperate in formulating project ideas by means of a virtual conference, there was an important task for the moderator. On one hand there is the role of creating community, which is needed to get participants committed. On the other hand, in a medium where a lot of flexibility is offered, it is necessary to structure the process. In 'Learn to Build a Brighter Future' one moderator was available for each discussion group. Next to the clearly defined basic task, the moderator in TTsec was asked to structure the conference and the TTvoc moderator was asked to create a sense of community. The exact task description is given in Appendix A. In this way it was possible to compare the importance of the two roles. Another role identified in this virtual conference is the role of the stimulator. Two participants in each stream were asked to keep this discussion going by telling about their own situation and asking questions to the participants. The difference between the moderator and the stimulator is that the participants perceive the stimulator as one of the other participants while the moderator is seen as the leader. The stimulator took over the content part of the moderator.

The elaboration of project plans was guided using guidelines on project formulation. Each group was asked to prepare a short project outline to be presented during the live conference. Since the process of choosing projects and the development of the projects took more time than expected, the live conference had become more like a workshop to further develop the projects.

The Live Conference

From December eight to ten, a two-day face-to-face meeting of the participants completed the conference. During this live conference, the most active participants had the chance to meet in person and present their findings and project outlines to a targeted audience. The live conference, therefore, had both an evaluative character and a formative and accelerating impact on project development.

Product for 'Learn to Build a Brighter Future'

To help present the product in a systematic way, the waterfall model (Preece, 1994) is used (see Figure 3.4).

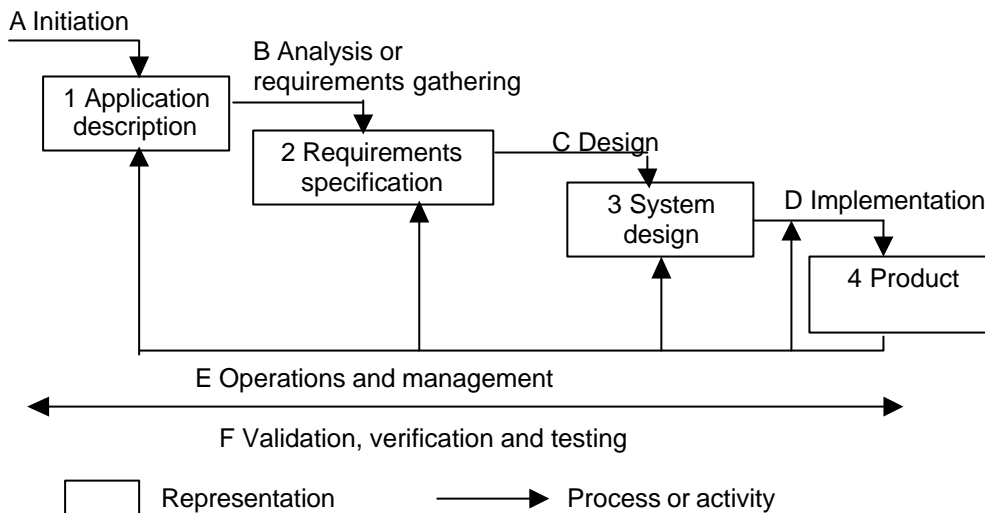


Figure 3.4: Waterfall model of system development

Initiation

The beginning of a design process is a description of what exactly should be designed, the application description. Interviews with IICD employees showed that the reason to organise a virtual conference was not only to bring experts from developing and developed countries together. Extra reasons IICD had were adding extra functions to the website and increasing the number of hits. Besides, IICD is thinking of organising virtual conferences more often and therefore IICD wished to acquire some knowledge in their organisation. A definition could clearly describe what is needed; therefore the following definition is given. The design of a website accessible for all participants at any time to discuss themes of common interest.

Analysis or Requirements Gathering

In this phase, the objectives of the organising committee and the preconditions offered by participants are combined in order to extract minimal requirements to the product. The final product of this phase is a design rationale. A design rationale is a description of the most important choices that have led to given design decisions (Preece, 1994). Based upon this specification, the process of design is undertaken.

1. *Enhance the exchange and dissemination of knowledge in this area.*

To achieve this, it is necessary to at least have a text-based medium through which the communication takes place. Since not all the participants had access to the web, the communication should also be possible by email. Resources should be available in the website by a virtual library to increase dissemination of knowledge in this area.

2. *Raise awareness concerning the use of ICT as a tool to achieve the exchange and dissemination of knowledge.*

In order to raise awareness not only among the participants but also among a much broader public, summaries of the discussion are publicly accessible.

3. *Create a platform for practitioners to share experiences, best practices and lessons learned.*

When one of the objectives is creating a platform, people should know who else are participating. By using photos of participants it is more likely that fellow participants become more familiar and so there is better chance for a network to be created.

4. *Provide a forum for experts, teachers and trainers from both developed and developing countries, businesses, non-governmental organisations (NGOs) and international organisations, to discuss and jointly develop projects that innovatively apply ICT to building training capacity.*

To form project teams to formulate concrete project proposals, a certain level of commitment and management is needed. Therefore it is necessary to define who is and who is not a member of the group, so the discussion area should be protected. It is the task of the moderator to offer this level of management and ask commitment from the participants. For collaboration to further develop the projects the virtual conference environment should offer the possibility to share change and upload files.

Guideline: A virtual conference environment must be sensitive to the differing needs of its users

The Counter supplied information on technical dispositions of the participants. The system requirement was that at least 95% of the visitors should be able to have good view on the virtual conference environment.

Aspects	Requirement
Resolution	800x600
Colour depth	256 (8bit)
Browser	Netscape 3.x

Table 3.2: Requirements the website design

System Design

The process of system design results in a formal representation of the system. This describes all aspects of the system at a suitable level of detail. Since the proposed and the realised system differ in some aspects from each other, in this paragraph both the proposed system and the actually realised system are described, including reasons for the differences.

Guideline: Use a hierarchical structure to organise a virtual conference environment

A hierarchical structure is an effective way to organise a web environment when the information is complex, it is possible to divide it into topics and subtopics, and the target group is novices in the field (Remmers, 1998). A virtual conference with different subjects and features is particularly an environment that can be divided in different parts. The actual target group is not novice in the field of computer use, but most of them are novices in the field of virtual conferencing, so it is good to have the hierarchical structure.

Guideline: Use familiar metaphors in designing the interface

In the design of the virtual conference environment, the metaphor of a conference building is used. The aim is that participants who never attended a virtual conference but who are familiar with live conferences will not easily get lost within the conference site (see Table 3.3).

Virtual Conference	Metaphor	Visualisation
Conference site	Conference centre	Website like a building with doors and door signs to go to other parts in the website.
Welcoming page	Entrance	Door
Introduction page	Reception	Desk with a lady behind it and direction signs. At the desk you can log on.
Discussion areas	Conference rooms	Door with a sign of the topic
Background papers	Speakers	Picture of the "speaker" and a document of the paper
Links to relevant literature and websites	Library	Door with library sign (=button), within the library links and literature are structured in topic of the area teaching methodologies, ICT in developing countries, etc.
Delegates list with information about the participants	Lunchroom for the networking opportunities.	Lunchroom with name badge at the table or passageway with people walking by
Cooperation in generating pilot projects	Project table	Document share applications
Appointments for live conference	Calendar	Button at the left side of the webpage with a picture of a calendar
Conference administrator	Organiser	Administrator is reachable by e-mail in case of problems
Discussion leader	Moderator	Moderator is responsible for the content and continuation of the discussion
Report with summary	Archive	Part of IICD's website is the archive in which the report with summary is placed.

Table 3.3: Metaphor of the elements of a virtual conference

Guideline: Use features in the virtual conference site that have an additional contribution to achieving the objectives of the virtual conference

It was decided that the virtual conference environment should include the following features.

At the information page (entrance) weekly summaries are published in order to raise awareness concerning the use of ICT in teacher training under the broader public. Framed, no frames and graphic-text versions would be offered to the participants at the first page of the virtual conference environment. Like in a live conference, networking happens during lunches and coffee breaks. This opportunity is made available in the virtual conference by a lunchroom. The lunchroom is a part of the website where unfortunately no lunch is served, but background information per participant is offered complete with picture. The email addresses of participants are included in case participants feel like contacting each other.

In order to achieve the result of cooperating in project groups through a virtual conference a certain level of commitment is needed from the participants. A password protection feature prevents the virtual conference to become a discussion arena where everybody can join rather than one close and committed group of participants. It is also very important that the virtual conference is structured, the objectives and deadlines are totally clear. A calendar is implemented to make appointments between the participants personally and on conference level. Per discussion group a discussion area is offered, a key paper to introduce the discussion and a project table for developing project ideas. Concerning the actual discussion medium, the bulletin board, the guideline that threaded structures are better for question-and-answer applications, while linear structures are more conducive to extended deep conversations was formulated. Since it was aimed to have an extended, deep discussion, a linearly structured bulletin board is chosen.

A single-stage login script makes it possible for the participants to see what messages they have already read and what messages are new. Another guideline was to combine both asynchronous and synchronous communication in order to capitalise on the benefits of both. Synchronous communication, chat, is applied for decision processes and social talk between participants, while the asynchronous communication, the bulletin board, is implemented for the more deep going discussions.

Implementation

The implementation process involves activities such as programming and testing the system, writing manuals and other documentation, implementing databases and entering data into the system. This process results in the final product. This paragraph describes the realised product by successively a description of the structure, interface and the features.

The virtual conference environment was a protected part of IICD's website. Only people who were given the password could log on to the virtual conference. The structure of the virtual conference site is visualised in Figure 3.5.

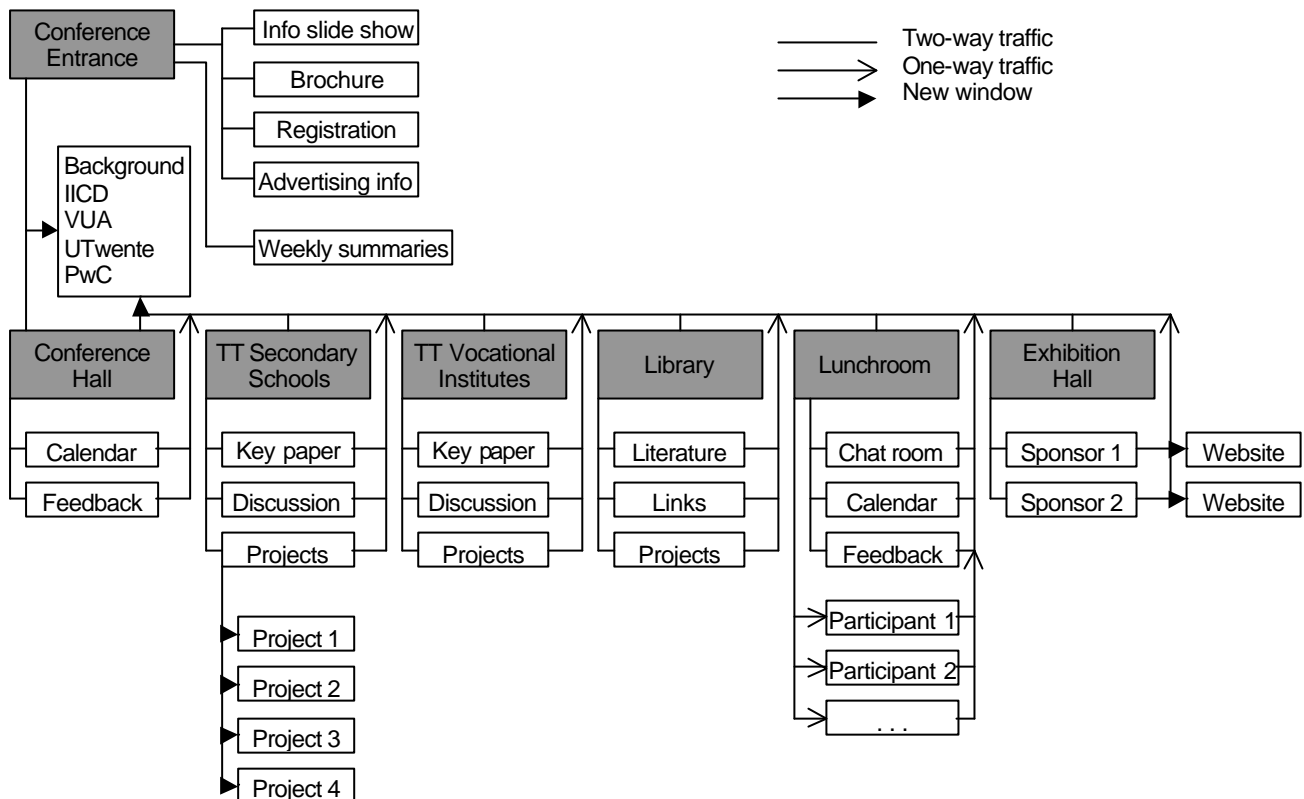


Figure 3.5: Structure of the 'Learn to Build a Brighter Future' virtual conference environment

Due to time constraints and lack of human resources it could not be realised to build in the option at the first web page for the participants to choose a frame-no frame and graphic-text version of the virtual conference environment. For promotional reasons, to attract possible sponsors, the realised website included both pictures and frames.

The technical team chose the Ultimate Bulletin Board (UBB) as asynchronous communication medium. The UBB is an online discussion forum programme with messages in linear style. Once a day, the moderator sent the posted messages to the participants by email, so also participants without web access could receive the messages. The moderator also had the authority to edit or remove messages and start or close topics.

After five weeks of discussion four project proposals were chosen and the participants were asked to choose one project to participate in. After this selection procedure, the project teams were invited in an Egroup since from that moment on, the project groups were independent working groups. Egroups was chosen because in this system it is possible to share, edit, and upload documents in the vault and there is a synchronous linkage between email and the bulletin board. The project leader had the responsibility for the functioning of the group and the development of the project proposals.

Figure 3.6 illustrates the central point of the virtual conference – the conference hall. General announcements were made in this area.

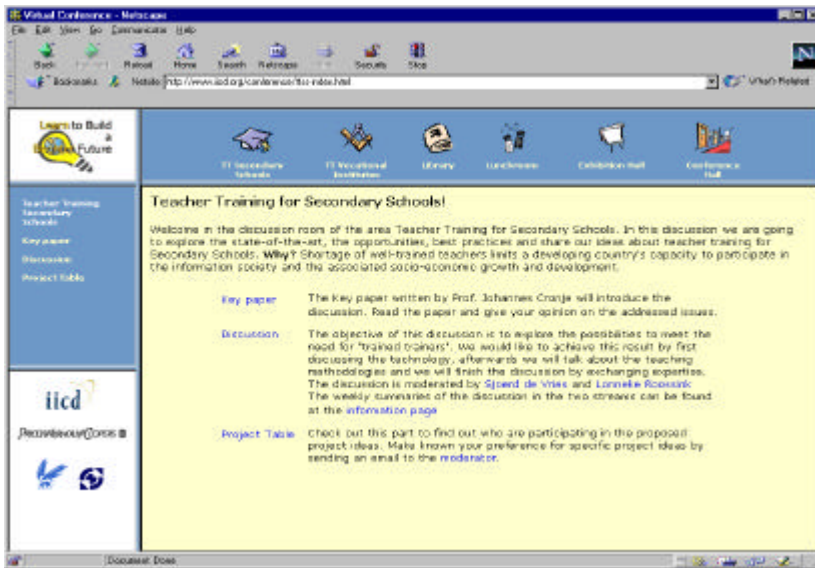


Figure 3.6: Screen dump of the conference hall

There were two rooms focused on the actual topic of the virtual conference: Teacher training for secondary schools and Teacher training for vocational institutes. Both areas consist of a discussion area (Ultimate Bulletin Board), a key paper in four versions: .HTML, .DOC, .TXT and .RTF to introduce the discussion, and a project table (Egroups) for further development of the project ideas. Since the two focus areas are the same, only the screen dump of Teacher training for secondary schools is given in Figure 3.7.

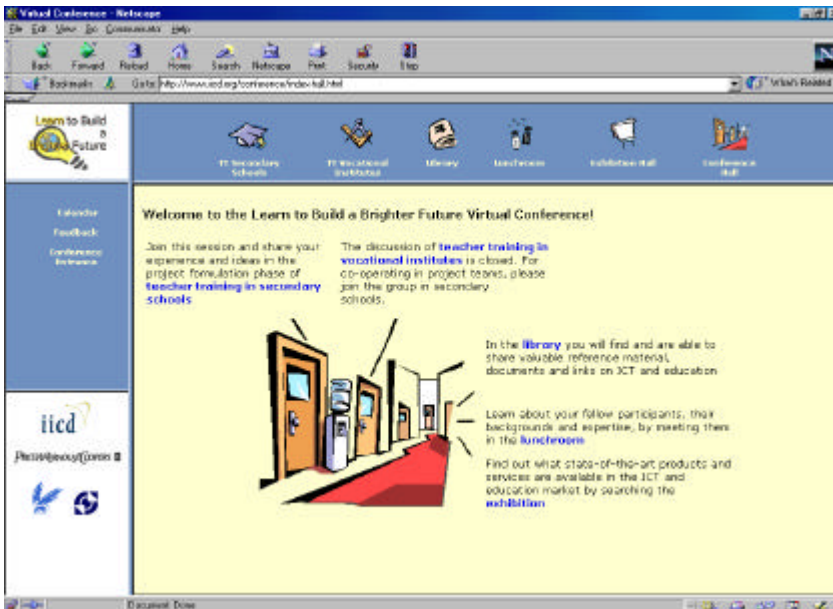


Figure 3.7: Screen dump of the discussion group teacher training for secondary schools

The lunchroom was designed to improve network opportunities by providing background information of the participants. It was called a lunchroom since during a live conference the lunch is the place to get to know other participants. The lunchroom as presented in Figure 3.8 was clear and easy to design in the given timeframe.

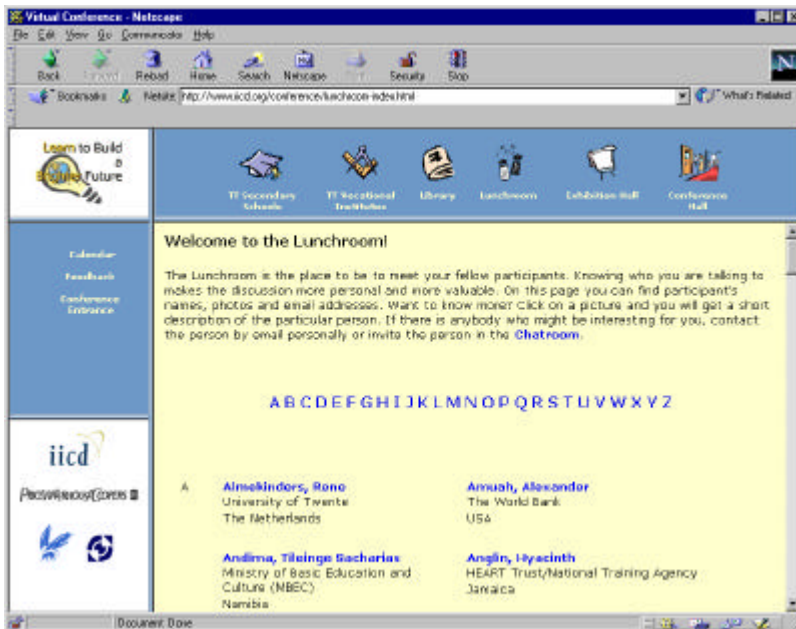


Figure 3.8: Screen dump of the lunchroom

Once in the lunchroom, the names of all participants were presented, including their organisation and country. One click on a name gave more detailed information, often complete with picture. An example of the more detailed personal information is presented in Figure 3.9.



Figure 3.9: Screen dump of a participant in the lunchroom

A virtual library was chosen to help raise awareness in the area of ICT in education. Relevant resources - literature, projects and web links were listed from the start of the virtual conference. Participants could also add relevant information by sending it to the librarian.

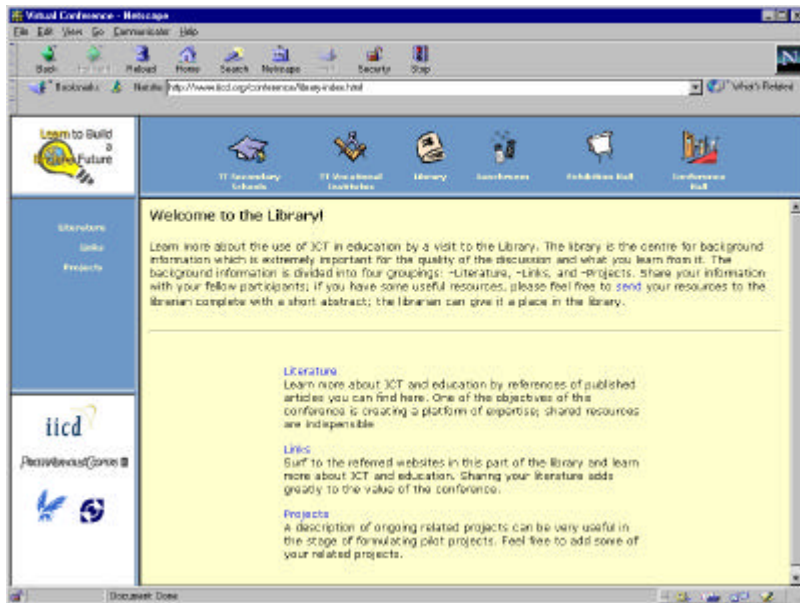


Figure 3.10: Screen dump of the virtual library

A virtual conference provides a good promotion opportunity for private companies. The 'Learn to Build a Brighter Future' organising committee organised a virtual exhibition hall in order to present the sponsors' logos. The sponsor's logo was clickable and led to the company's promotion page, which was to be set up according to given guidelines. The virtual exhibition hall with one sponsor is presented in Figure 3.11.

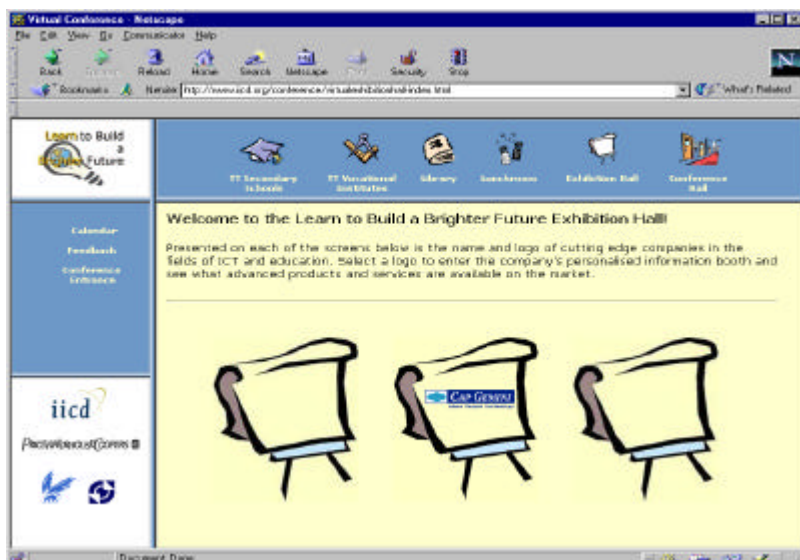


Figure 3.11: Screen dump virtual exhibition hall

Operations and Management

The operations and management process involves running the system, enhancing the system and correcting any system errors discovered after the product was implemented.

Formative evaluation in a design process is very important, but since the production of the final product took much more time than expected, there was no time for extensive formative evaluation. This lack could partly be covered by the information supplied by 'The Counter'. The other part of formative evaluation had to be done during the first week of the virtual conference. It appeared that the trial version of the UBB was installed, in which the moderator had no edit options. In the second week the trial version was replaced by a professional version.

At first the bulletin board was the main communication medium, and participants could subscribe to a mailing list if they preferred this medium or if they did not have access to the web. Since nobody subscribed while it was known that there were people without access to the web, it was turned the other way round. Every participant now received the messages by email until they unsubscribed. Information on how to unsubscribe was supplied at the very first email before the virtual conference started. Since the mailing list and the bulletin board were not directly linked, it was the moderator's task to send the messages posted on the bulletin board to the mailing list. This update was done once a day.

Since there was no evaluation in the implementation phase, it was very important to keep an eye on the continuation of the virtual conference in the first few weeks. A feedback form was present in the conference site so in case if people have problems, questions or suggestions during the virtual conference they knew where to send them. Especially at the conference entrance it was important to offer a contact address for log on problems. The feedback form was used only twice, but the 'mail to' option at the first page of the virtual conference environment was used several times. Despite the technical information sent by email at the beginning, many participants forgot or lost their passwords.

In the last week of the virtual conference, a message was sent to the TTvoc mailing list with the announcement that this group would be merged with the TTsec group because of the inactivity in the TTvoc group. Two recipients could not be reached, the error message was sent back to the list instead of to the sender and due to a configuration error the message was not bounced. So all the member of the list received this error message including the recipients with the wrong address so again the error messages were sent. This situation caused a mailbomb, which caused problems for participants in developing countries and surely did not motivate the participants.

Broken link recovery, a service offered by SEVENTwentyfour hc., was used to make sure there were no broken links. The system warned the webmaster if there were any broken links. The requirement was that a link should be working the same day the broken link was found.

Twice during the continuation of the virtual conference there was a meeting between the members of the organising committee to discuss the continuation and to evaluate the conference environment. During these meetings the system was checked with the design requirements.

Conclusion

This chapter described the design of the 'Learn to Build a Brighter Future' conference. Some of the guidelines concerning the product, the virtual conference environment, were not covered because of problems encountered during the design process. Information from an invisible tracker used prior to the start of the virtual conference to determine participants' technological characteristics was very useful.

The whole concept of the 'Learn to Build a Brighter Future' project was starting off with a virtual conference finalised by a live conference for the most active participants, in order to further develop project ideas as a result of the virtual conference. The virtual conference lasted for seven weeks, five weeks for discussion, and two weeks for defining project ideas. The five weeks for discussion were subdivided in three topics, methodology, technology, and best practices. In total 83 participants took part, 65 in the discussion group TTsec and 36 in the discussion group TTvoc.

Despite problems encountered during the design process the final version of the virtual conference environment was finished in time. The conference site had two main rooms in which the two topics were discussed through the use of UBB and email and introduced by a background paper. A virtual project environment was designed for the cooperation in further developing project proposals. Other elements in the conference environment were a lunchroom, virtual library, virtual exhibition hall, feedback form for online help, calendar, and weekly summaries.

EVALUATION OF 'LEARN TO BUILD A BRIGHTER FUTURE'

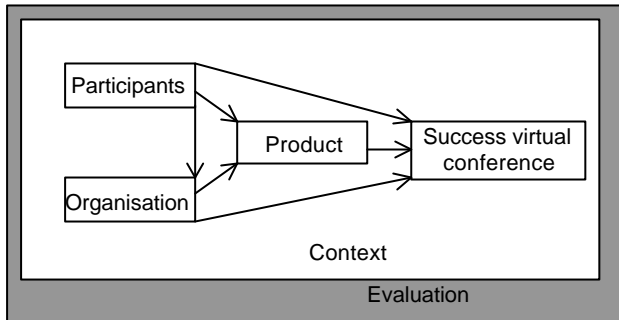


Figure 4.1: Focus on evaluation within conceptual model of a virtual conference

Evaluation of the Guidelines

The virtual conference 'Learn to Build a Brighter Future' was designed according to the guidelines presented on page fifteen. Here, the guidelines, as far as they were implemented, are evaluated and, if necessary revised, based on the results of the evaluation.

The study employed a variety of research instruments and techniques, thereby creating a "mixed method" (Caracelli & Green, 1993) study. Examples of how to measure the success of a virtual conference are attitude of participants, number of sent messages, participation rate, log-file analysis, communication process, and interaction patterns (Ishidi, 1998). The methods in this research used to examine the guidelines are questionnaires, observations, in-depth interviews and log-file analysis. In order to ask the participants about their background and attitude towards the virtual conference, a questionnaire was constructed according to the six phases model of formulating and annotating problems (Bartelds, Jansen and Joostens, 1989). The questionnaires were sent to the participants by email since this medium is fast, the participants are used to this medium and it is certain that the questionnaire reaches the intended respondent. In total 26 questionnaires were completed and returned but one of them could not be opened, so 25 questionnaires, 30% of the participants were used for analysis.

Log-file analysis is an analysis of the visitor's behaviour based on the log-file. A log-file is a file that lists actions that have occurred. With log-file analysis tools, it is possible to get an idea of where visitors are coming from, how often they return, and how they navigate through a site. The log-file analysis tools used in this research were both OpenWebScope and WebTrends. This method was used in a limited way since this information is not fully reliable due to the influence of caching and proxy servers (Huizingh, 1999). A more detailed overview of log-file statistics about 'Learn to Build a Brighter Future' is presented in Appendix D. When Log-file analysis is done it is important to make a distinction between views, unique users, user-sessions, and hits. A view is accounting of the number of known web documents (.HTML) that were looked at. A unique visitor is a single user that has not visited your website before, based on hostname. A user-session measures the number of log-ons a user did. And finally, any action that takes place on the web server, each image on a page, each frame in a frame set counts as a hit (OpenWebScope, 1999).

During the live conference, interviews were conducted to gain better insight in why participants have a certain attitude towards the virtual conference.

Was it a Success?

The reasons for participants to take part in this virtual conference were also asked in the questionnaire. A number of possible reasons were formulated and the participants were asked to mark the reasons that applied to their situation. Besides these reasons, there was space to give additional reasons. The answers to this question are presented in Table 4.1.

Why did you choose to participate in the virtual conference?	(%)
1. To learn from the discussion	78
2. To build a network	48
3. To benefit from formulating concrete project proposals	35
4. To experience a virtual conference in general	78
5. I was asked to	22
Other: (to know about teacher training)	

Table 4.1: Reasons to participate

The main reasons for the participants to take part in the virtual conference were to learn from the discussion and to experience a virtual conference in general. The third most important reason to participate was to build a network, followed by to benefit from the project proposals. Being asked as a reason to participate was not so important.

To get an idea to what degree the organisation's objectives have been achieved, a number of statements were given on the success of the virtual conference. The participants were asked to mark the statements that were applicable for their situation (see Figure 4.2).

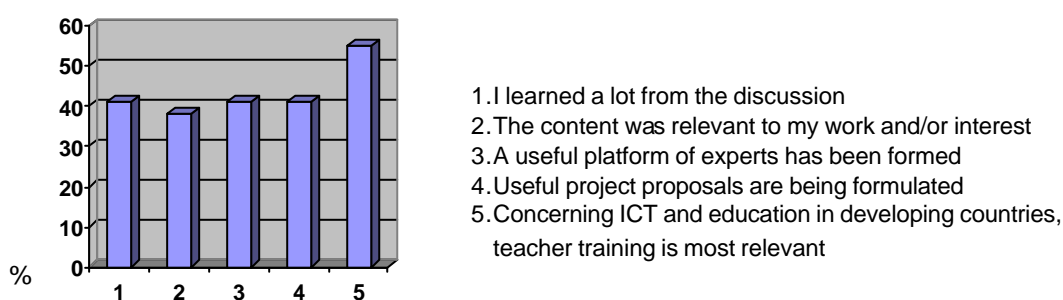


Figure 4.2: Success of the conference according to the participants

As can be seen in this figure, all statements were applicable for almost half of the participants. These numbers independently do not supply sufficient information to be able to say if the virtual conference was successful or not; it should be related to each participant's reasons to take part and the extent to which these objectives have been achieved. This combination shows that in 70% of the cases, at least one of the mentioned reason to participate, or objective, has been achieved.

85% of the participants from developing countries indicate that at least one, but mostly all objectives have been achieved. Since this virtual conference was focused at developing countries, the virtual conference can be referred to as successful.

Results Participants

Earlier it was suggested that pre-expectations, attitude towards computers, and experience were three of the crucial factors that influenced the success of a virtual conference. Through a questionnaire, information on the background of the participants was gathered. Table 4.2 presents the questions that were asked and the answers given. The answer categories were:

- = Strongly disagree
- = Disagree
- + = Do not know
- + = Agree
- ++ = Strongly agree

Background information	--	-	+ -	+	++	Median
I work a lot with computers	0	1	0	13	16	++
I have a positive attitude towards computers	0	0	0	17	13	+
I had high expectations of the results of the virtual conference	1	5	9	10	3	+ -

Table 4.2: Answers to questions about participants' background

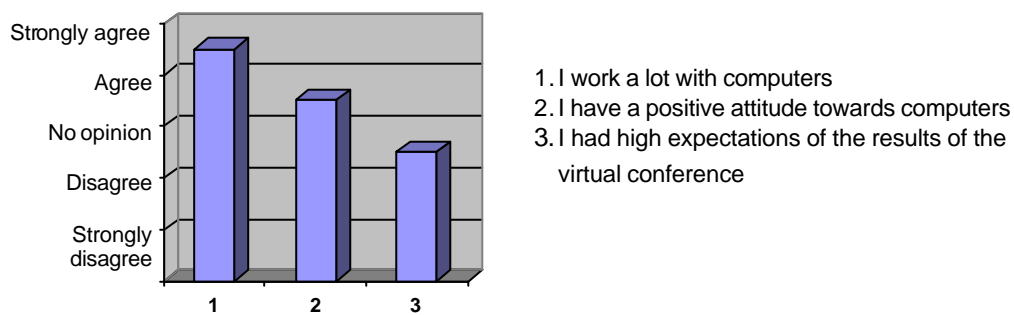


Figure 4.3: Answers to questions on participants' background

The information gathered on the participants' background form a relatively positive ground for success. The less positive part was the expectations of the results. The participants did not know what to expect from the virtual conference. The participants were also asked to mark the barriers they experienced for posting messages. The barriers and the results are presented in Table 4.3.

(- = Strongly disagree; + = Strongly agree)

The barriers for posting messages:	--	-	+ -	+	++	Median
Time	0	1	0	17	11	+
English language	13	3	0	3	1	--
Slow connection	8	6	0	6	2	-
Other technical limitations	8	6	1	0	3	-
Not knowing the other participants	7	6	3	2	2	-
Differences in cultural backgrounds	10	2	0	7	0	--

Table 4.3: Main barriers for posting messages

Other barriers that were mentioned included that there had been few reactions from other participants and a general unfamiliarity with such a mode of exchange.

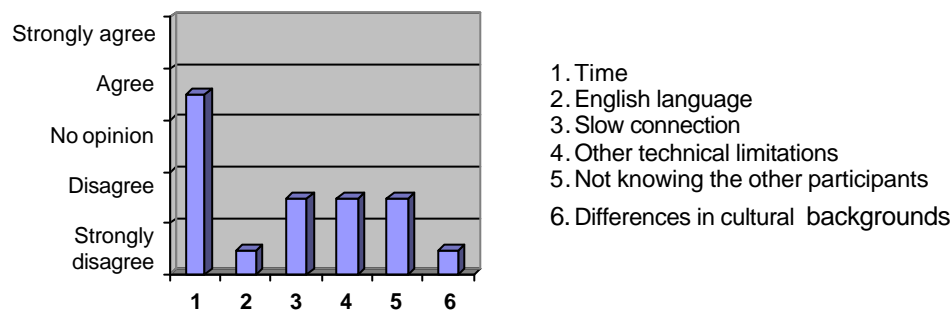


Figure 4.4: Main barriers for posting messages

Figure 4.4 shows that 'time' was the main and only barrier that was perceived by the participants. English as a second language and differences in cultural backgrounds were no problem at all. There were no differences between the TTvoc and the TTsec group.

Results Organisation

As has been said before, it is important to define roles. In this virtual conference the roles of the moderator and the stimulator were defined and executed. In Figure 4.5 the messages sent by participants, moderator and stimulators are given. As we can see, the peaks of the participants go up and down about simultaneously with the stimulators' peaks. The line of the moderator is more stable, so it is not possible to say something about the direct influence of number of messages sent by the moderator to the number of messages sent by participants.

In Figure 4.5 can be seen that after week four the number of sent messages decreased quickly. This is an indication that the timeframe of a virtual conference should not be longer than four weeks, perhaps five weeks is the maximum.

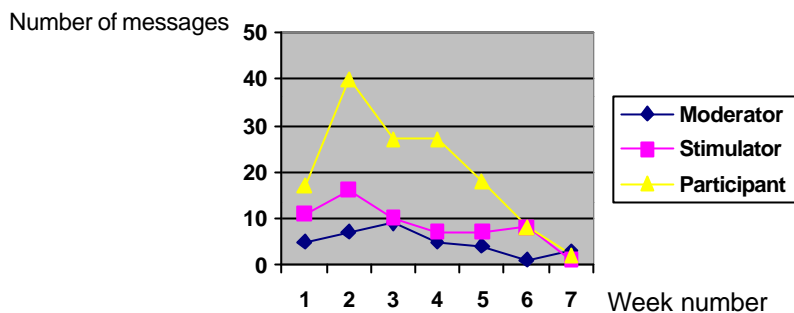


Figure 4.5: Number of messages sent per week

If the two groups are taken together, 48% of the participants posted messages. An analysis of the separate groups shows that TTsec with the number of 65 people of whom 33 people sent messages caused an active and comprehensible discussion. The number of 36 participants in TTvoc, of whom only eleven participants posted messages, appeared to be insufficient in this medium for getting an active discussion.

In order to get some information on the attitude of the participants regarding the timeframe of the virtual conference, the question in Table 4.4 was asked.

What do you think of the timeframe of the virtual conference?		
Good	9	65%
Too long	4	29%
Too short	1	7%

Table 4.4: Answers concerning timeframe of the virtual conference

To collect data on the participant's attitude towards organisation decisions in the virtual conference, a questionnaire is given to the group of active participants who have attended the live conference. The participants were asked to rate the statements presented in Table 4.5.

(- = Strongly disagree; + = Strongly agree)

	--	-	+ -	+	++	Median
Satisfied with the progress made by my project group	1	0	0	10	3	+
It was useful to attend the live conference	0	0	1	9	3	+
The prospect of a live meeting motivated me	1	3	2	4	4	+
The current results could have been achieved by a virtual conference only	4	8	1	1	0	-
A virtual conference is a good medium to develop project proposals	0	3	3	5	2	+
Last few weeks I did not actively participate since "we were meeting live anyway"	2	7	3	2	0	-

Table 4.5: Answers concerning organisational aspects

Interviews with the participants made clear that the division of the focus three times, first methodology followed by technology and ending with best practices, made that the conference was not too long and attention did not get lost. A suggestion one of the participants did was to introduce the new topic with a separate key paper of about two or four pages instead of one large key paper at the beginning attributing to these three topics.

Observations and participants' reactions have shown that the division of the conference in two discussion groups was not really necessary. The focus of the two discussion groups was so much alike that it would have been better to combine it in one group.

Participant:

"It was for myself a nice experience to attend a virtual workshop, it was the first one and it is a nice way of doing this. However it takes much more time than one would guess. As you think it can be done between normal business, that is not the case. You should take at least an hour a day to follow the discussion and prepare a contribution. The suggestion that one hour a week would do did not make sense."

Results Product

The conference site was set up with a number of features: library with relevant resources, lunchroom with background information of participants, calendar etc. It is assumed that all these features are essential to the success of the virtual conference. Log files have been analysed to find out how many times the features were used. Also in the questionnaire the participants were asked to rate the different features. Table 4.6 presents the results to the question: Which of the following features did you find essential to the success of the virtual conference?

- = Not essential at all
- = Not Essential
- + = Do not know
- + = Essential
- ++ = Very essential

Features	--	-	+ -	+	++	Median
Bulletin board	0	1	5	6	6	+
Mailing list	0	0	2	8	7	+
Key paper	0	3	4	8	4	+
Lunchroom	1	1	5	7	1	+
Chat room	2	5	3	3	1	-/+
Library	3	3	2	6	1	+-
Exhibition hall	4	4	3	3	0	-
Calendar	3	3	3	3	1	+-
Feedback form	3	1	5	2	2	+-
Weekly summaries	0	0	2	6	8	+/++
Moderator	1	1	1	5	7	+
Password requirement	4	0	4	4	3	+-

Table 4.6: Importance per feature for a successful virtual conference

In order to give an overview of the median values Figure 4.6 is constructed.

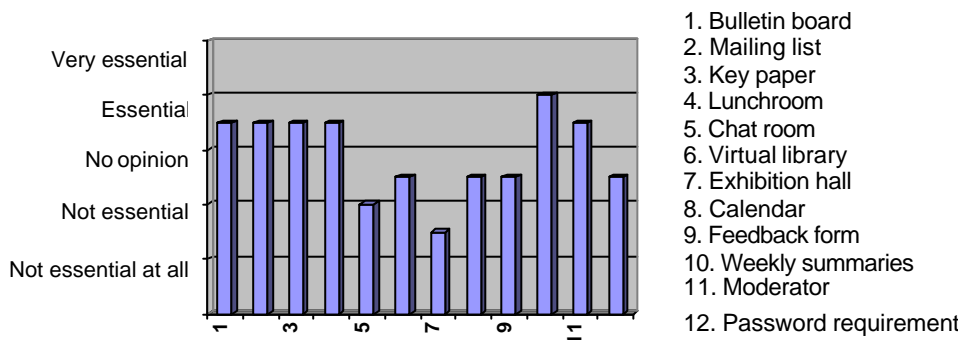


Figure 4.6: Evaluation of the features

The participants perceived the weekly summaries as most essential to the success of a virtual conference. Also the bulletin board, mailing list, key paper, lunchroom, and the moderator were essential. The exhibition hall was perceived as not essential and the other features were undecided.

The log file provides information on the number of visits that the participants have paid to the different features.

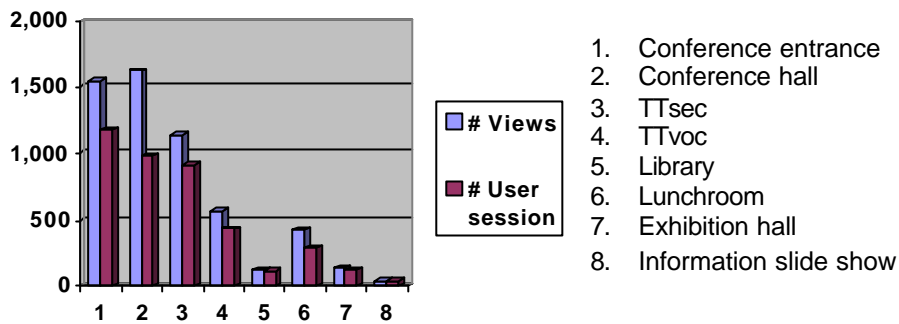


Figure 4.7: Log-file analysis per feature

Observations during the virtual conference showed that the chat room, where people could communicate by means of synchronous communication was not used at all. In addition, the participants evaluated the chat room as Not essential / No opinion. The organising team did use a chat room in order to make the final decision on which projects to choose. In this situation synchronous communication appeared to be an appropriate medium.

In order to find out about the participants' attitudes towards the interface, the participants were asked to rate the statements in Table 4.7:

(- - = Strongly disagree; + + = Strongly agree)

The conference website:	- -	-	+ -	+	+ +	Median
Is easy to navigate	0	4	1	10	3	+
Is attractive	0	3	3	6	5	+
Has a clear structure	0	4	0	9	4	+

Table 4.7: Participants' opinion on interface website

The website interface was evaluated with a +. The median of the participants found the website easy to navigate, attractive and that it has a clear structure.

Even though the structure is valued with a +, there were comments from participants that the bulletin board, the most important part of the virtual conference environment was too many clicks away from the conference entrance. This is an indication of the fact that flexibility is very important for the structure of a virtual conference environment.

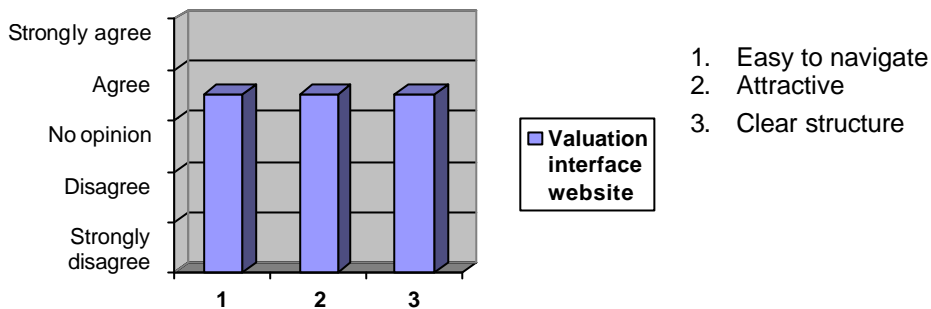


Figure 4.8: Results evaluation interface website

Participant:

"This was my very first attempt to participate in a virtual conference. I did not quite know what to expect. I thought people might "look at me and wonder what I was doing participating in something like this. I thought I would be "knocked off" electronically by someone somewhere who thought I was out of line. But then I found it very interesting once we started. Unfortunately our connection to the outside world in Nairobi was disrupted almost around the same time. All the momentum and enthusiasm I had going in were derailed. I never recovered. Almost like a student who is looking forward to first computer programming course, but finds out at the beginning of the course that the computer they are supposed to do the programming on is out of order. I never recovered but from time to time "peeked in" as if through the classroom window to see how the others were doing. I would very much like to participate again and then I will be sure my hardware and connectivity do not give me the excuse not to participate."

Discussion

The first objective, to enhance the exchange and dissemination of knowledge in the area of ICT and teacher training, was achieved by a discussion with high-level content. Besides, 40% of the participants said that they learned a lot from the content of the virtual conference. The second objective, to raise awareness concerning the use of ICT as a tool to achieve this goal, was achieved since many participants said that it was their first time to participate in a virtual conference. They say it was a good experience and now they are aware of the use of virtual conferences as a medium in this area. Also 40% of the participants agree that a useful platform for practitioners to share experiences, best practices and lessons learned has been created. The aim of the organising committee's fourth objective was to discuss and develop two project ideas per discussion group. Eventually four project proposals were chosen to further develop during the live conference, but these project proposals were the result of TTsec only, instead of both discussion groups. Based on the last objective, only TTsec was successful.

A combination of the success factors perceived by the participants and their reason to participate shows that in 70% of the cases, at least one of the mentioned reason to participate, or objective, has been achieved. 85% of the participants from developing countries indicate that at least one, but mostly all objectives have been achieved. Since this virtual conference was focused at developing countries, the virtual conference can be referred to as successful.

The objectives of the organising committee however, did not respond to the main reasons for the participants to join. The main reasons for participants to take part in the virtual conference were to experience a virtual conference in general and to learn from the discussion. The reasons to build a network and benefit from the project proposals were only the third and fourth main reason.

Participants

The guideline that was defined for the participants' characteristics was to define minimal requirements to the participants in terms of time and access to technology depending on the timeframe and mode of communication. The minimal requirement in terms of time in 'Learn to Build a Brighter Future' was one hour a week. This appeared to be insufficient to follow the discussion properly. On average the more active participants spent three hours a week participating. Concerning the requirement in terms of technology, it was found that 12% of the participants took part in the virtual conference exclusively by email and still, it was perceived as a good medium. Therefore the minimal requirement in terms of technology is access to email.

Organisation

The concept of the 'Learn to Build a Brighter Future' conference was a virtual conference for seven weeks finalised by a live conference for three days. On average the participants agreed that the live conference was useful and that the results at the end of the live conference could not have been achieved by a virtual conference only. In addition, the participants were motivated by the prospect of a live meeting and disagreed that they postponed participation to the live meeting. It can be concluded that the concept of first a virtual conference finalised by a live conference is successful. But in this way one of the main advantages of organising a virtual conference, the cost-effectiveness, is unsatisfactory.

Concerning the size of the virtual conference it was said that more participants should be invited than the aimed number of active participants. In the 'Learn to Build a Brighter Future' virtual conference 48% of the total number of participants posted messages. The TTsec group officially had 65 participants but besides the 65 participants who had subscribed for this group, also the subscribers of the TTvoc group could and did participate. The TTvoc group had 36 subscribers, and this group did not achieve the aimed level of activity, so a number of 36 subscribers in this group is not enough. The TTsec group was an active group but could still be more active. Therefore the proposed number of participants in the same circumstances is 60-80 participants per discussion group.

The timeframe of the virtual conference was evaluated during the live conference. 64% found seven weeks a good timeframe, 29% said it was too long and 7% found it too short. The reason why participants found seven weeks too short was because there was not enough time for the development of project proposals. The main reason why it was found appropriate was because of the division in different subjects. The evaluation of the timeframe was done during the live conference where only the most active participants were presented. This could influence this result since those participants who dropped out because of the long term were not invited to the live conference. Therefore it is also looked at the message flow and this shows that after four weeks the message flow decreased with approximately eight messages a week from 27 messages in week 4 until two messages in week 7, the last week. This is an indicator that four weeks is an appropriate timeframe for the running of a virtual conference.

Interviews with the participants made clear that the division of the focus, first on methodology followed by technology and ending with best practices, meant that the conference was not too long and attention did not flow away. A suggestion one of the participants did was to introduce the new topic with a separate key paper of two-four pages instead of one large key paper at the beginning attributing to these three topics. The background paper for both streams was 25 pages long and was introduced at the beginning of the conference. The opinion of the participants was that the paper was too long and did not really cover the topic of the discussion. A better solution could be to fragment the information, split the paper and give the background information on the topic of the coming week(s).

Concerning the role of the moderator, it appeared that managing and structuring the virtual conference is a very important task for the moderator. It is more important than creating a sense of community.

Observations and participants' reactions have shown that the division of the conference in two discussion groups was not desired. The focuses of the two discussion groups were so much alike that it would have been better to combine it in one group. Therefore it is suggested to divide the discussion only into groups if both the subject and target group are distinctively different.

Product

The structure, navigation and the interface of the 'Learn to Build a Brighter Future' conference environment are all rated with a +. The average of the participants found the website easy to navigate, attractive and that it has a clear structure. Despite the guideline said to use a hierarchical structure, the environment was built in frames and therefore the structure had more similarities to a web structure. Still the most important part of the virtual conference environment, the bulletin board, is said to be too many clicks away from the entrance. Therefore a web structure (Remmers, 1998) is a better structure of a virtual conference environment since there is more flexibility for the user.

The participants experience the bulletin board, mailing list, key paper, lunchroom, moderator, and weekly summaries as essential to the success of the virtual conference. The exhibition hall is perceived as not essential and the other features are undecided. Some of the features were not even used. An explanation could be that the participants did not have the control over the features themselves. In order to create community it is important that participants have control over the features themselves. Wilson and Johnson call this multi-user management: the capability to change or edit the system is important to develop a sense of ownership in the system, but it should be managed so that the structural integrity and coherence of the knowledge base are maintained (Wilson & Jonasson, 1989). In the 'Learn to Build a Brighter Future' conference this was not the case: participants could send their contributions to the librarian who could place it in the library. If participants can do it themselves this could make that they feel more responsible and therefore more motivated. A recommendation could be to change this feature in following virtual conferences and compare the results.

An extra note can be added to the mailing list feature; in this virtual conference the mailing list and the bulletin board were not related to each other. It was a task for the moderator to send those messages that were posted to the bulletin board to the mailing list so that the participants who joined the discussion exclusively by email could also receive the messages. A result of this was that

messages on the mailing list and the bulletin board did not appear simultaneously. This was perceived as a weakness.

The guideline on bulletin board structure is that threaded structures are better for question-and-answer applications like technical support, while linear structures are more conducive to extended, deep conversation (Woolley, 1998). The experience during 'Learn to Build a Brighter Future' was that the linear structure was not adequate for this discussion. A remark of one of the participants was that the linear structure was somewhat problematic, especially at the southern tip of Africa where "bandwidth" is a real problem, since one had to keep on accessing all the messages to see if something new has cropped up. In view of this remark, a solution could be to use cookies or a single stage login script and the participants know which messages are new since their last visit. Most participants seemed to prefer a threaded structure, but the findings in this study were not strong enough to be able to recommend one of the structures.

Eventually, the observations have discovered a number of errors during the virtual conference. A mailbomb in the TTvoc group in the last week may have influenced the fact that the participants in TTvoc were in general less positive. The web server, which hosted the virtual conference, was twice down for approximately a day. These facts of course do not increase participant's motivation. It is important that all technical issues are intact before starting to organise a virtual conference. This means the application works correctly, all the time, and is secure against various external threats and natural disasters (Messerschmidt, 1999).

Based on the evaluation results of the virtual conference 'Learn to Build a Brighter Future' most of the general guidelines were revised. Table 4.8 presents the revised guidelines. The guidelines in normal text are the guidelines based on literature and agreed by this evaluation. The text in *Italics* is the revisions.

Guidelines		
Participants	General	
Design factors	Adjust the organisation of the virtual conference and the virtual conference environment to the identified design factors.	
Requirements	Define minimal requirements to the participants in terms of time and access to technology. For text-based asynchronous communication, on average three hours a week is necessary for active participation. The minimum access to technology is disposition of email.	
Organisation	General	Participants
Objectives		Make clear what the objectives of the virtual conference are and what is expected from the participants.
Subject	Make a division in the conference with the focus on different subjects. Introduce every new subject with a short key paper and give a predefined end.	Make sure that the subject is relevant to the participants' situation and at the appropriate level.

Size	Take into account that there is always a number of “lurkers” so invite more people than the aimed active number. A number of 60-80 participants serves an active but comprehensible discussion.	Divide the discussion <i>only if both the subject and the target group are distinctively different.</i>
Roles	Clearly define roles of a moderator and a stimulator in order to facilitate group functioning. Managing the conference is the most important task for the moderator.	Offer detailed weekly summaries.
Timeframe	Choose a timeframe long enough for reflective input and short enough for keeping motivation; the second week is most active and after four weeks most of the participants start losing attention.	
Product	General	Participants
Structure		Organisation
		<i>Use a web structure to organise a virtual conference environment since it offers much flexibility to the participants.</i>
Interface	Present information using multiple complementary symbols, formats and perspectives. Use familiar metaphors in designing the interface.	Be careful with icons of stereotypes and colour symbolism that may be culturally sensitive (Eekma, 1996). A virtual conference environment must be sensitive to the differing needs of its users.
Guidelines		
Features	Make sure you have a trustworthy webserver before you start to organise a virtual conference. <i>Combine both asynchronous and synchronous communication in order to capitalise on the benefits of both: asynchronous communication is more appropriate for deep going discussions and synchronous communication is more suitable for making appointments or decisions.</i>	Use features in the virtual conference site that have an additional contribution to achieving the objectives of the virtual conference. <i>Features essential for a successful virtual conference are: bulletin board, mailing list, key paper, lunchroom (background information on the participants), moderator, and weekly summaries.</i>

Table 4.8: Revised guidelines for the set up of a virtual conference

CONCLUSIONS AND RECOMMENDATIONS

The central question in this report was “How should a successful virtual conference be set up?”. To answer this question, guidelines were formulated which focused particularly on the three success factors participants, organisation, and product. The virtual conference 'Learn to Build a Brighter Future' was designed mainly according to these guidelines. In the evaluation, the guidelines were tested through observation, log-file analysis, questionnaires, and in-depth interviews with organisers and active participants. The main findings are described below.

It was stated that the participants had to satisfy minimal requirements before they were allowed to take part. It appeared that the minimal requirements concerning time was the ability to spend at least three hours a week to take part in the virtual conference. Concerning technology, it appeared that a comprehensible discussion was also possible for those who participated exclusively by email. So it can be concluded that the minimal requirement concerning technology is disposition of email.

Related to organisational decisions, 'Learn to Build a Brighter Future' showed that the timeframe for future asynchronous, text-based virtual conferences should not be longer than four weeks. A number of sixty to eighty participants per discussion group should be the target since this number provides an active, but comprehensible discussion. The information supplied, for example in the format of a key paper, should be split into pieces. Instead of one large key paper at the beginning it is better to divide this paper in smaller parts and offer that part that is relevant for the discussion at that moment. It also appeared to be important for the continuation of the virtual conference to define roles; a stimulator to keep the discussion going in content and the moderator to structure the virtual conference. It appeared that a sense of community is important, but it is not in the first place the task for the moderator to create this. The concept of 'Learn to Build a Brighter Future' was starting off with a virtual conference finalised by a live conference where participants could meet face-to-face. A sense of community is something that easily exists between participants who know each other. And getting to know each other is much easier face-to-face than virtually. Therefore a recommendation for organising virtual conferences such as 'Learn to Build a Brighter Future' would be to organise the live conference prior to the virtual conference.

In terms of product, the virtual conference environment, the metaphor of a conference building was well chosen. A web structure, a structure where most separate elements are linked to each other, proved to be a good structure to organise a virtual conference environment because of its flexibility for the user. The features that were essential to the success of a virtual conference were the bulletin board, mailing list, key paper, background information about the participants including picture, moderator and weekly summaries.

During the continuation of 'Learn to Build a Brighter Future', a number of problems were encountered concerning the virtual conference environment. It is obvious that organisations thinking of hosting a virtual conference have to be sure that their webserver is reliable and the software used is appropriate for its objectives. Therefore an overview of conferencing software based on Friezen (1999) is given in Appendix F.

Recommendations

Based on the findings in this research, three recommendations for further research into the field of virtual conferencing are described in this paragraph.

Only text-based media were used in the virtual conference 'Learn to Build a Brighter Future'. It appeared that time, or more specific lack of time, was the main barrier perceived as a reason for not posting messages. Even though the time that participants are willing to spend depends for a great deal on their commitment, still, further research should be done into designing of a virtual conference environment in a way that it takes less time for participants.

An important finding in this research was that the main task for the moderator is to structure and manage the conference, rather than create a sense of community. "The more flexibility is offered, the more structure is required." Further research should be done in how to structure a virtual conference optimally. Can protocols or a template for sending messages increase the structure? How should the virtual conference environment be designed in order to create more structure? On what points should the organisation be improved to contribute to more structure? What further implications does it have for the moderator?

The methods used in the evaluation of 'Learn to Build a Brighter Future' were observations, log-file analysis, questionnaires and interviews. This mixed method appeared to be a good combination to gain the needed data. Participation rate was an important indicator for success, and the number of messages sent by participants measured the participation rate. Only in limited way, attention was paid to the content of the messages, although this could give useful additional information on the success of a virtual conference. A recommendation for further evaluation of virtual conferences is to use content analysis for analysing the messages: Who sends messages to whom? Do the messages contain humour, anger or support? What kind of message is it, a question, an apology, an explanation, an answer or a direction? Are there any interaction patterns to distinguish? An example of such an analysis can be found in Cronjé and Clarke (1999).

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DEFINITIONS AND ABBREVIATIONS

Asynchronous: Not synchronised; not occurring at predetermined or regular intervals.

Browser: Short for Web browser, a software application used to locate and display web pages.

Bulletin board: An electronic message centre.

Cache: a special high-speed storage mechanism. It can be either a reserved section of main memory or an independent high-speed storage device.

CMC: Computer mediated communication.

Commitment: The intention of participants to actively participate in the virtual conference.

Communication medium: The instrument through which the communication process takes place.

Effectiveness: The extent to which activities lead to attaining one specific goal.

Email: Short for electronic mail. A way to send messages of files via the Internet; the sender and receiver do not need to be online at the same time.

Frame: Separate sections that divide one webpage. Each frame really is a webpage and is loaded separately.

GKP: Global Knowledge Partnership.

Host: The administrator or manager of a conferencing system and of the conferences held on that system (Boak & Blackburn, 1998).

ICT: Information and Communication Technology.

IICD: International Institute for Communication and Development.

Internet: A global network connecting millions of computers.

Log file: A file that lists actions that have occurred. For example, Web servers maintain log files listing every request made to the server.

Lurker: A person who is participating in a virtual conference by reading other participants' contributions and does not contribute him/herself.

Mailing list: A list of e-mail addresses identified by a single name, such as TTsecondaryschools@iicd.org. When an e-mail message is sent to the mailing list name, it is automatically forwarded to all the addresses in the list.

Moderator: A person who leads the discussion in a virtual conference.

NGO: Non-governmental organisation.

Online: Connected to the Internet.

Proxy server: A server that sits between a client application, such as a Web browser, and a real server. It intercepts all requests to the real server to see if it can fulfil the requests itself. If not, it forwards the request to the real server.

Stimulator: A person who is like a participant, but has the extra task to keep up the discussion in content and stimulate other participants to be active.

Synchronous: Occurring at regular intervals; in real time.

Structure of a WWW environment: The visible sequence of, and relationships between the WWW pages.

TTsec: Discussion group teacher training for secondary schools.

TTvoc: Discussion group teacher training for vocational institutes.

URL: Uniform Resource Locator.

User-interface: The totality of surface aspects of a computer system, such as its input and output devices, the information presented to or elicited for the user, feedback presented to the user, the system's behaviour, its documentation and associated training programmes, and the user's actions with respect to these aspects.

Virtual Conference: An activity, organised in a way that participants can meet and discuss themes of common interest through the use of communication tools on a central location on the Internet.

VUA: Vrije Universiteit van Amsterdam (Free University of Amsterdam).

World Wide Web (WWW): A global network in which a great number of Internet sites are linked.

APPENDIX A: MODERATOR TASKS

Moderator Teacher Training for Secondary Schools

A moderator is of crucial importance to bring a virtual discussion group around a certain theme to a valuable result. An important task for a moderator is being a gatekeeper. A gatekeeper filters irrelevant or attacking messages. Besides the gatekeeper, a moderator is also a manager. The role of manager involves structuring the message flow, keep the discussion focused subject to be discussed, supply information and make weekly summaries.

Learn to Build a Brighter Future

The virtual conference 'Learn to Build a Brighter Future' continues for seven weeks, from September 20th until November 5th, 1999. The conference site can be found at the Internet, URL: www.iicd.org/conference. On this site, two discussion groups will take place simultaneously: Teacher training for secondary schools and teacher training for vocational institutes. The discussion is introduced by a key paper, which can be downloaded from the conference site at <http://www.iicd.org/conference/tts-index.html>. Within these seven weeks, the discussion will focus successively on the following three topics: teaching methodology, educational technology and exchange of expertise. The conference is finalised by developing project proposals. This sequence is visualised in Figure 1. The language used in the conference is exclusively English. It is expected to take one hour a day to moderate 'Learn to Build a Brighter Future'.

	Teacher training for vocational institutes	Teacher training for secondary schools
Teaching methodology 20/09-01/10		
Educational technology 27/09-08/10		
Exchange of expertise 04/10-15/10		
Project proposal 18/10-29/10		

Table 1: The virtual conference's subjects

Way of Working

The participants can directly post their messages to the virtual conference site. The moderator checks the messages *subsequently* and adjusts the structure if needed. If there are messages that are not proper in terms of language, it is the moderator's task to delete the message and inform the sender why the message is deleted. For a guide to what messages are allowed, have a look at the netiquette.

Besides, the moderator should close threads if they are unsurveyable. In case of deadlines, see Figure 1, the moderator should make the participants aware of the deadlines. So the first two weeks are about didactics and teaching methodologies. Make clear which direction the discussion needs to go and what the results are expected to be. Keep in mind that we are aiming mainly practical results (project proposals) and try to direct the discussion to the formulation of possible project ideas.

Two stimulators have been asked to stimulate the discussion in content: Rob Merkus and Johannes Cronje. Especially, keep close contact with Rob Merkus (p.merkus@dienst.vu.nl).

Since there are also participants who do not have access to the WWW, the messages are also distributed by a mailing list. The mailing list for secondary schools is: TTsecondary-schools@list.iicd.nl

These messages need to be structured very carefully. It is aimed to number all threads in the subject. Message 1 in thread 1 gets number 1: [Title]. The first reaction to this message gets number 1.1: [Title], the second reaction to this message gets number 1.2: [Title] etcetera. In this way, if the participants store their messages alphabetically in their mailbox, they will get threads in their mailbox.

A comparison is made of the two moderators' tasks in order to get clear the difference. Besides the specific tasks described below, there are basic tasks of sending the messages posted on the website to the mailing list and *visa versa*.

Task Moderator Secondary Schools

The task of the TTsec moderator mainly focused on managing the discussion in a *business* way. Managing means mainly structuring the messages, controlling the process, and making clear deadlines. The tasks are described in detail below.

Structuring

- Change irregular titles in a title that closely describes the content of the message;
- Long threads become unsurveyable. Close threads that become too long (approximately ten messages). Try to find an ending message and start a new topic with this message;
- Divide one thread into two threads if this makes the whole clearer, and;
- At the end of each week make a summary describing what happened the last week and close the summary with discussion statements for the following week.

Process control

- Make clear what the subject of that week is and what the results are expected to be;
- Make the participants aware of the existence of the calendar. And point at events that are in the calendar;
- Perhaps you can place some coming events in the calendar yourself;
- Point at the presence of the virtual library and at relevant literature that can be found in the virtual library, and;
- Invite people to send relevant literature to the librarian. The librarian can add the suggested literature to the collection.

Task Moderator Vocational Institutes

The task of the TTvoc moderator is mainly to create a social and friendly environment and stimulate the participants personally. The following part suggests techniques that can, and if necessary have to, be used to motivate the participants.

Motivate

- An important step to create a sense of community and keep the participants committed is getting to know the fellow participants at a personal and professional level. In order to achieve this, a lunchroom is constructed in the conference site. The lunchroom is a space where participants can find background information complete with a picture about the other participants. Have a look at the lunchroom and get some information about the participants yourself. Invite participants in an individual email and refer to their expertise to pay attention to a specific subject;
- Make the participants aware of the presence of the lunchroom and try to persuade the participants to have a look at the lunchroom themselves;
- Ask participants their opinion about a given subject. You can do this by means of both the mailing list and individual email;
- Refer to the presence of the chat room and the opportunity to invite fellow participants. Also for social talks;
- Encourage participants to contact other participants individually, apart from this conference;
- Encourage participants to ask questions they would like to have answered;
- Thank participants for their contributions (for example in personal mail), and;
- Ask open questions.

Netiquette

- Netiquettes have been formulated to create a general concept of what is acceptable and what is not acceptable in a virtual conference. This way a kind of social climate is determined. If people use attacking language, which could be misunderstood by other participants, edit the message and inform the sender why it was edited, and;
- Point at the netiquette, they are shown at the page participants get to see if they register.

APPENDIX B: QUESTIONNAIRE VIRTUAL CONFERENCE



QUESTIONNAIRE TO EVALUATE THE VIRTUAL CONFERENCE

Please fill out this questionnaire as completely as possible. You can send it electronically to the following address:

Awieman@iicd.org

... Yes, send me the results

... No, don't send me the results

1. Why did you choose to participate in the virtual conference? (Please, mark all that apply by typing an 'x' on the dotted line)

... To learn from the discussion

... To build a network

... To benefit from formulating concrete project proposals

... To experience a virtual conference in general

... I was asked to

... Other (give reason):

2. Which discussion group did you attend? (Please, mark all that apply)

... ICT and teacher training for secondary schools

... ICT and teacher training for vocational institutes

3. Success (Please, mark all that apply)

... I learned a lot from the virtual conference

... The content was relevant to my work and/or interest

... A useful platform of experts has been formed

... Useful project proposals are being formulated

... Concerning ICT and education in developing countries, teacher training is most relevant

4. The following consists of some statements concerning your situation. Please select for each statement the option that most strongly applies to your opinion.

-- = Strongly disagree

- = Disagree

+ = Do not know

+ = Agree

++ = Strongly agree

	--	-	+ -	+	++
I work a lot with computers					
I have a positive attitude towards computers					
My organisation is not ready yet to apply ICT (to Education)					
I had high expectations of the results of the virtual conference					

The barriers I experienced for posting messages were:	--	-	+ -	+	++
Dispose of limited technology					
English language					
Time					
Not knowing the other participants					
Differences in cultural backgrounds					
Other:					

5. On average, how many hours a week did you spend participating? (Participating includes reading messages and other forms of learning from the virtual conference.)

..... Hours

If you did not participate at all, please give the reason and reply this questionnaire. Thank you for your co-operation.

I did not spend time participating because...

If you did participate, please continue following questions.

Website design

The following two questions are about the conference website. If you followed the discussion exclusively by email, please go to question 8.

6. The conference website:	--	-	+ -	+	++
Is easy to navigate					
Is attractive					
Has a clear structure					

7. Which of the following features did you find essential to the success of the virtual conference? (Please select for each statement the option that most strongly applies to your opinion and feel free to give additional comments per feature)

- = Not essential at all
- = Not Essential
- + - = Do not know
- + = Essential
- ++ = Very essential

Features	--	-	+ -	+	++
Bulletin board					
Mailing list					
Key paper					
Lunchroom					
Chat room					
Library					
Exhibition hall					
Calendar					
Feedback form					
Weekly summaries					
Moderator					
Password requirement					

8. What features did you miss?

-

9. What did you like best about Learn to Build a Brighter Future? (Please elaborate)

-

10. What did you dislike most about Learn to Build a Brighter Future? (Please elaborate)

-

11. Would you consider attending a virtual conference again?

... Yes, because...

... No, because...

Moderator

The following two questions are meant for participants who have attended the discussion group ICT and Teacher Training for Secondary Schools (question 12) and participants who have attended the ICT and Teacher Training for Vocational Institutes discussion (question 13). If you have attended both streams please, complete both questions.

Please select for each statement the option that most strongly applies to your opinion.

-- = Strongly disagree

- = Disagree

+ = Do not know

+ = Agree

++ = Strongly agree

12. Teacher Training for Secondary Schools	--	-	+ -	+	++
I perceived a friendly and socially environment					
The moderator created a community					
I did not get to know any of the other participants					
The structure of the conference made it hard to follow the discussion					
The moderator structured the conference					
The objectives and deadlines were clear					

How many participants in this stream did you already know before the virtual conference started?
(Please mark the one that applies)

... 0 - 2

... 3 - 5

... 6 - 10

... >11

Any further comments you would like to make regarding teacher training for secondary schools:

-

13. Teacher Training for Vocational Institutes	--	-	+ -	+	++
I perceived a friendly and socially environment					
The moderator created a community					
I did not get to know any of the other participants					
The structure of the conference made it hard to follow the discussion					
The moderator structured the conference					
The objectives and deadlines were clear					

How many participants in this stream did you already know before the virtual conference started?
(Please mark the one that applies)

- ... 0 - 2
- ... 3 - 5
- ... 6 - 10
- ... >11

Any further comments you would like to make regarding teacher training for vocational institutes:

-

14. Please, feel free to give your additional comments to the virtual conference 'Learn to Build a Brighter Future' in general

Thank you very much for your co-operation!

APPENDIX C: NETIQUETTE (NETWORK ETIQUETTE)

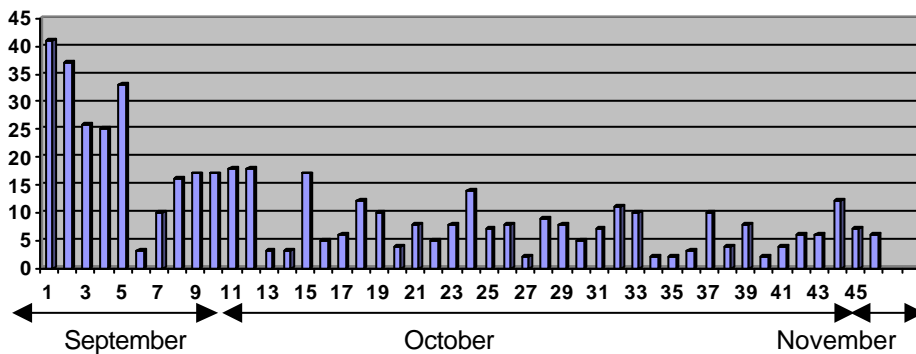
- Messages must be relevant to the topics of the discussion;
- Profanity and personal attacks are not acceptable;
- If you react to a message, do not keep the body of the original text in your replies, except the part you are reacting to;
- Make subject header as descriptive as possible about the message content. In that way, people can more easily decide what messages they want to read;
- When you respond to a message, keep the original subjects heading intact unless it is no longer relevant to the message content;
- Please exercise tolerance and respect toward other participants whose views may differ from your own;
- Please remain courteous at all times;
- When you would like to have a personal discussion, or feel offended by a particular message, please send a message to the individual involved only;
- Avoid writing in capitals since it implies YOU ARE SHOUTING;
- Do not use language that is condescending, hostile, inflammatory, racist or sexist;
- If English is your second language; don't be afraid of making mistakes. Making clear your thoughts is most important;
- Compose your thoughts clearly, and;
- Be supportive of others by encouraging and praising contributions.

APPENDIX D: LOG-FILE ANALYSIS

Log-file analysis 'Learn to Build a Brighter Future'

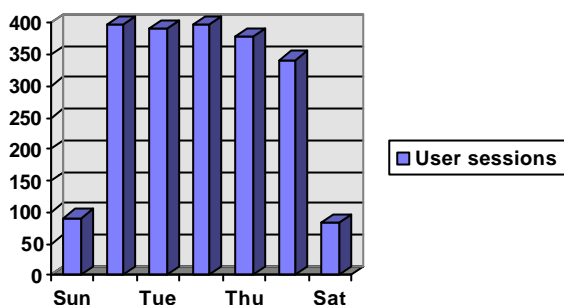
Summary	
Timeframe	09/20/99 - 11/05/99
Most Popular Day	Sep-21
Number of Successful Hits for Entire Site	55,199
Number of Page Views (Impressions)	32,695
Number of User Sessions	2,077
Average Number of Hits Per Day	1,174
Average Number of Page Views Per Day	695
Average Number of User Sessions Per Day	44
Average User Session Length	00:08:32
Average Unique Visitors per day	11
Number of Unique Users	518
Number of Users Who Visited Once	367
Number of Users Who Visited More Than Once	151
Total Domains	153
Total Countries	34

Daily Usage (unique visitors)



Activity Level by Day of the Week

This section shows the activity for each day of the week for the report period (i.e. if there are two Mondays in the report period, the value presented is the sum of all hits for both Mondays.) Values in the table do not include erred hits.



Most Active Countries

This section identifies the top locations of the visitors to the site by country. The country of the user is determined by the suffix of their domain name. This information is based on where the domain name of the visitor is registered, and may not always be an accurate identifier of the actual geographic location of this visitor. For example, while a vast majority of .com domain names are from the United States, there is a small minority of domain names that exist outside of the United States.

Most active countries (User sessions)	
Netherlands	663
United States	427
Botswana	86
Tanzania	65
Luxembourg	59
Chile	56
South Africa	51
Swaziland	46
Hong Kong	42
Latvia	32
Bolivia	28
Ghana	27
Zimbabwe	23
Portugal	13
Colombia	10

Number of Users Per Number of Visits

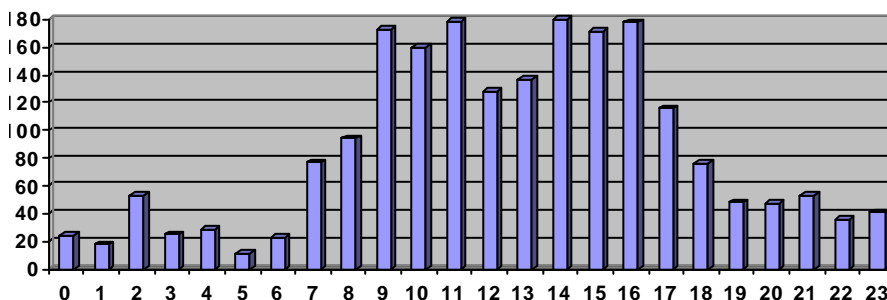
This section shows the distribution of users based on how many times each user visited the site

Number of Users Per Number of Visits	
Number of Visits	Number of Users
1 visit	367
2 visits	46
3 visits	19
4 visits	16
5 visits	9
6 visits	6
7 visits	5
8 visits	2
9 visits	3
10 or more visits	45

Activity Level by Hours

This section shows the most and the least active hour of the day for the report period. The second table breaks down activity for the given report period to show the average activity for each individual hour of the day (if there are several days in the report period, the value presented is the sum of all hits during that period of time for all days). All times are referenced to the location of the system running the analysis.

Activity level by hours (user sessions)



APPENDIX E: COMPARING CONFERENCING SYSTEMS

Feature comparison of 5 examples of conferencing systems by Friesen (1999). Also available at URL: <http://www.atl.ualberta.ca/articles/conf/webbased.cfm> for more information.

Generic conferencing components.

	Allaire Forums	Altavista Forum	FirstClass	WWW-Board	WebBoard
	www.allaire.com	Altavista. Software. Digital.com/ forum	www. softarc.com	World widemart. com/scripts/	webboard. ora.com
# of Forums	Unlimited	25-Unlimited	Unlimited	Unlimited	20-Unlimited
Synch. Chat		Yes	Yes		Yes
File sharing		Yes	Yes		
Attachments	Yes	Yes	Yes		Yes
Security levels	Yes	Yes	Yes		Yes
Bulletin Board		Yes	Yes		
Admin. Wizard	Yes				Yes
Use tracking	Yes		Yes		Yes
Searching	Yes	Yes		Yes	Yes
Scheduling		Yes	Yes		
Subgroups	Yes		Yes		
Free Demo	Yes	Yes	Yes	Yes	Yes
Mac			Yes		
Windows NT	Yes	Yes	Yes	Yes	Yes
Unix		Yes		Yes	
		\$ 495			\$ 85
Cost (US \$)	\$ 795 (US)	\$ 3995 (US)	\$1000's(US)	Free	\$ 149(CDN)

APPENDIX F: WEB VERSUS EMAIL BASED COMMUNICATION

The major advantage of an email-based conference is the effort needed from participants to join. It takes effort to visit a site to see if there is anything new, and the activity there must consistently be useful and compelling, or most people will fall out of the habit of checking in. Some people never form the habit even if the content is useful, simply because there is nothing to remind them to check the conference. Discussions that take place over e-mail lists do not have this problem. E-mail discussions come to you, rather than you having to go look for them. Besides, it requires effort to stop receiving messages from an e-mail list. Once you have subscribed to a list, you must take conscious action in order to unsubscribe. For this reason alone, e-mail lists have a natural tendency to accumulate participants over time, while Web conferences have a natural tendency to lose participants. E-mail lists also have an advantage for applications where the discussion is sporadic. A list can lie dormant for weeks or months, and then spring to life again when one participant posts a new message.

On the other hand, web-based conferences have many advantages over email-based conferences. Some of the more important ones concern the context, selective reading, heavy traffic and sense of place.

Context

E-mail messages arrive in your in-box in random order, with no context. In order to establish context, participants must quote material from earlier messages. Often people quote entire lengthy messages, because email software typically does this automatically. It's not uncommon to see quoting two or three levels deep: quotes of quotes of quotes. All this extraneous material tends to obscure the flow of the conversation. By contrast, a Web conference establishes context for each message automatically. To see what prompted a given reply, it's only necessary to scroll up or click on a "previous message" button. Next to this it is also possible to offer other features in the conference like background materials and information of other participants.

Selective Reading

A participant in a Web conference can choose which threads of conversation to follow. Often there is a way to "forget" or "ignore" a topic that doesn't interest you, so that future responses to the topic are not displayed at all. But with an e-mail list, it's all or nothing.

Heavy Traffic

Participants in e-mail lists are easily overwhelmed if the amount of message traffic increases significantly, or if a number of topics are being discussed simultaneously. Most people are sensitive to the amount of e-mail they receive. This is why a misplaced "unsubscribe" request, or an off-topic message, frequently generates a torrent of angry replies. Managers of high volume lists sometimes find it necessary to institute rules about how often people may post in order to prevent the list from disintegrating. Web-based conferences can support high volume discussions much more easily,

due to the way they organise conversations and their ability to allow selective reading. A bit of off-topic banter in a Web conference is no great cause for alarm, because it is so easily ignored.

Sense of Place

Web conferences provide an immerse environment that gives participants a "sense of place." A well-designed conference gives its participants visual cues as to what sort of place it is, who is present, and what the expectations are. In this place extra features like a virtual library and background information on the participants can be supplied.

For a clear overview of the advantages and disadvantages in the comparison of web-based discussion or email-based discussion next table is constructed.

	+	-
Web-based	Context Sense of place More opportunities in design to get people committed Selective Reading	Action required from participants to attend All participants must dispose of (graphical) web access Selective reading
Email	Messages reach participants automatically Little bandwidth is required Dormant discussions can spring to live when one participant posts a message Action is required to unsubscribe	Structure All or nothing Information overload Context: participant must quote text or leave the whole message in the reply: obscure message flow

Table 1: (Dis) Advantages of web and email based discussion.

Taking the above into account, the solution is likely to be found in a combination of email and web sites. One way to get people to return to a virtual conference is to notify participants by email when there is new activity in a conference they have joined. This can be done in a number of ways. The appropriateness of the solutions depends mostly on participants' characteristics and volume of messages in the discussion. In next graph the solutions are set out with as most important parameters the level of access and the volume of the discussion (pace of message flow).

- Send all emails to participant's mailboxes;
- Notification of new topic;
- Notification of new messages;
- Notification of new reply to your message/topic, and;
- Summaries sent by email.

Level of access		
Access	-All emails to participants' mailboxes	-Notification of new topic -Notification of new reply to your message/topic
	-Notification of new messages	-Summaries sent by email
No access	-Send all emails to participants mailboxes	-Summaries sent by email
	Low	High
		Volume

Table 2: Appropriateness of solution regarding access and volume

IICD PROFILE

The International Institute for Communication and Development (IICD) assists developing countries to realise sustainable development by harnessing the potential of information and communication technologies (ICTs). The driving force behind IICD activities is that local 'change agents' themselves identify and develop proposals for realistic ICT applications - local ownership forms the essential basis for sustainable socio-economic development.

Acting as a catalyst, IICD's three-pronged strategy is mainly delivered through a series of integrated Country Programmes.

First, IICD facilitates ICT Roundtable Processes in selected developing countries, where local stakeholders identify and formulate ICT-supported policies and projects based on local needs.

Second, working with training partners in each country, Capacity Development activities are organised to develop the skills and other capacities identified by the local partners.

Third, IICD draws on its global network to provide information and advice to its local partners, also fostering local information exchange networks on the use of ICTs for development. The best practices and lessons learned are documented and disseminated internationally through a Knowledge Sharing programme.

In support of these activities, IICD invests in the development of concrete partnerships with public, private and non profit organisations, thus mobilising knowledge and resources needed by IICD and its local partners.

Country Programmes are currently being implemented in Bolivia, Burkina Faso, Ghana, Jamaica, Mali, Tanzania, Uganda and Zambia.