Human Factors and Interactive Communications Technologies

Dr. Roy Lundin

Abstract: Human interaction through electronic communication technologies produces new virtual communication environments in which human behaviours appear to become modified, and which result in changes in the way people perceive each other. These 'human factors' include ways in which individuals invent communication 'shorthand' to convey messages, inhibition and disinhibition, group dynamics, and intercultural dynamics. These phenomena span all the application areas of education, administration, research, services, social communication and commerce. They also have considerable implications for the globalisation of communication networks where very different types of cultures need to interface. This paper will explore and illustrate some of the ways in which these human factors are expressed, draw implications for training programs and pose some research questions that still need to be addressed.

Resume: L'interaction humaine avec les technologies de communication electronique cree de nouveaux environnements dans lesquels les comportements humains semblent se modifier, ils amenent aussi des changements dans la maniere dont les gens se percoivent 1'un 1'autre. *Ces facteurs humains* incluent les facons que les individus ont d'inventer une communication *stenographiee* pour transmettre leurs messages, leurs inhibitions et leurs desinhibitions. la dynamique du groupe ainsi que les dynamiques interculturelles. Ces phenomenes se retrouvent dans les domaines d'application comme 1'education, 1'administration, la recherche, les services, la communication sociale et le commerce. Ils ont egalement des implications considerables dans la globalisation des reseaux de communication, oil des cultures tres differentes ont besoin d'une sorte *A'interface. C*et article explore et illustre quelques unes des facons dont sont exprimees ces *facteurs humains.* en tire les implications pour les programmes d'entramement et enfin indique quelques sujets de recherches qui meriteraient d'etre explores.

Human Factors and Technology

Imagine, if you can, a small room, hexagonal in shape, like the cell of a bee. It is lighted neither by a window nor by lamp, yet it is filled with a soft radiance. There are no apertures for ventilation, yet the air is fresh. There are no musical instruments, and yet, at the moment that my meditation opens, this room is throbbing with melodious sounds. An arm-chair is in the centre, by its side a reading-desk, that is all the furniture. And in the arm-chair there sits a swaddled lump of flesh, a woman, about five feet high, with a face as white as a fungus. It is to her that the little room belongs....

> "The Machine," they exclaimed, "feeds us and clothes us and houses us; through it we speak to one another, through it we see one another, in it we have our being. The Machine is the friend of ideas and the enemy of superstition: the Machine is omnipotent, eternal; blessed is the Machine." (E. M. Forster, The Machine Stops, 1928).

The interface between humans and technology has been the basis of discussion and training probably since the invention of the club and the wheel. As technology became increasingly complex and sophisticated, so too have the concepts and issues. Technology has profound impacts on the way people live, work and play; however, people in turn shape the technologies to do what is required to make them effective. That is, it is not just a matter of technological determinism. Humans bring their values to the technology and accept that which helps them do what they want to do. The notion of the omnipotent Machine becoming our complete way of living is frightening, but it is an unlikely scenario. In any event, Forster ends his story optimistically.

For example, humanising techniques for teleconferencing has been an important consideration in teletraining techniques for many years. Parker (1984) devotes a large section of his book, *Teletraining Means Business*, on the topic. The frequent use of names, tone of voice, expressing your personality, allowing for some informal chatter, using interactive formats, calling in the reticent and so on are all techniques used to make teleconferences successful.

Human interaction with and through newer electronic communication technologies produces new virtual communication environments in which human behaviours appear to become modified and which result in changes in the way people perceive each other. These range from the ways in which people interact with the hardware, the software, other individuals and with groups. Of particular interest is the extent to which human emotions and 'non verbals' are conveyed through the technologies, including email and audioconferencing where vision is not possible. There is no doubt that even audio and electronic text messages can carry moods and other meanings through tone of voice, nature of the words and symbols used. It is as possible to fall in love online as it was in the olden days through handwritten letters.

This paper will discuss some key observations of such behaviours: I say observations because there has been to my knowledge very little research into the implications of these kinds of behaviours and interactions.

The Help Line

The interface between humans and the hardware begins with understanding to some extent how the technology works. Most people can not or do not want to read the manual, and given some of the jargon and the ways in which some manuals are written this can be appreciated. Stories abound about people ringing the computer Help Line with problems relating to various parts of the technology. For example:

> AUSTIN, Texas - The exasperated help-line caller said she couldn't get her new Dell computer to turn on. Jay Ablinger, a Dell Computer Corp. technician, made sure the computer was plugged in and then asked the woman what happened when she pushed the power button. I've pushed and pushed on this foot pedal and nothing happened,' the woman replied. 'Foot pedal?' the technician asked. 'Yes,' the woman said, 'this little white foot pedal with the on switch.' The 'foot pedal," it turned out, was the computer's mouse, a hand-operated device that helps to control the computer's operations.

> Another rang to report that the coffee cup holder was broken, that the dish was not stable enough to hold the cup and that the whole thing was built in the wrong place and in the way. It was the CD player tray.

Another, rather dramatic example of not understanding the hardware was when a university lecturer was taking part in a videoconference trial to determine whether the institution should invest in this technology. At another, single, remote campus there were 13 students while the lecturer was at the main campus. One of the students was sitting off to the side of the group and over half of his body was 'off camera'. The lecturer walked up to the monitor at his site and tried to look around the corner to see the student's face as though he was looking through a window!

Some of the difficulties arise from the terminology being used. For example, it is common for people to use 'teleconference' when they mean 'audioconference'. 'Teleconference' for years has been used as a generic term to cover all forms of audio, audiographic, computer and video conferencing. A person from the US, a specialist in Early Childhood Education, visited Australia a couple of years ago and was invited to make a guest presentation on a national 'teleconference'; what was meant was an audioconference. However, the person showed up dressed in the best attire and asked where the make-up room was, expecting a videoconference or satellite television presentation.

Shorthand and Signals

Shorthand

Email without graphics has given rise to a whole set of shorthand signals and text-based 'graphics', called 'emoticons' or 'smileys', to convey moods and side comments. For example:

:-) Your basic smiley. This smiley is used to inflect a sarcastic or joking statement since we can't hear; voice inflection over e-mail.

;-) Winky smiley. User just made a flirtatious and/or sarcastic remark. More of a "don't hit me for what I just said" smiley.

:-(Frowning smiley. User did not like that last statement or is upset or depressed about something.

:-I Indifferent smiley. Better than a :-(but not quite as good as a :-).

:-> User just made a really biting sarcastic remark. Worse than a ;-).

>:-> User just made a really devilish remark.

>;-> Winky and devil combined. A very lewd remark was just made.

(-: User is left handed.

%-) User has been staring at a green screen for 15 hours straight.

:*) User is drunk.

(Ref:
<http://www.bic.mni.mcgill.ca/system/world/BigDummy/bdg_46.html>
<http://www.netlingo.com/smiley.html>
<http://clinfo.rockefeller.edu/manual/sminet.htm>)

It is through these types of symbols and side comments that human emotions are conveyed.

Signals

Some research has been conducted into the behaviours, particularly non-verbals, displayed in the use of desktop videoconferencing. Bednall (1995) reported that there were significant differences between individual and group use in this respect.

With regard to 'one-on-one' use, individuals cannot look at the desktop videoconference camera and the screen simultaneously because of their positioning. They usually look at the screen and this can interfere with the interpretations of expressions. Technical solutions using half mirrors have been proposed (Muhlbach, L., Bocker, M. & Prussog, A., 1995), but for practical purposes this doesn't seem necessary. What was also found, however, is that individuals wish to see themselves on the screen to monitor their own image in terms of lighting, hair, focus and so on (Bednall, 1995).

Bednall also reports that when one or more groups are involved in videoconferencing, the nature of the communication changes significantly, and usually becomes more formal with the imposition of procedures and protocols. When voice switching is used a whole new set of social rules on turn-taking is required. He states:

> For example, one study (of student use) revealed the development of a system of visual signals to indicate to other participants about when they want to speak and when they wanted other speakers to stop (Dykstra-Erikson, E. and others, 1995). The following table is adapted from this research. It shows a few of the spontaneous gestures which users developed.

Signing for the deaf is another example of the use of 'signals'. At a trial of the use of videoconferencing for an interpreting service for the deaf it was also found that the technology had specific limitations when it came to signing. The data rate

was the first significant factor in that anything under 256 kbps was found to be unacceptable for the reading of signing. The location of the camera for the deaf person and the interpreter was another element of concern because the signing needed to be done directly in front of the camera without too much arm movement or the hands went off camera. The most appropriate location for the camera seemed to be directly in the centre and below the monitor. When the hearing person, the relay interpreter and the deaf person were in different locations, the relay was more difficult than when the deaf person and hearing person were together and both on camera for the interpreter to see. However, this presented a different problem in configuration in that the placement of the monitor for the deaf person needed then to be behind/over the shoulder of the hearing person. This could sure be helped with graphic images allowing the reader to visualize the sceneries!

Gesture	Meaning
Cup hands around mouth, mouth words (no sound)	I want to be heard
Glare at camera	Pay attention to me/I'm paying attention to you
Cover camera lens	Not interested, stop, too much information
Earthquake (shake camera)	Disrupt group
Show watch to camera	Time!
Show inside of mouth or teeth to camera	Disrupt group

(Bednall, 1995, p 7)

Inhibition and Disinhibition

Inhibition and technophobia

Inhibition and technophobia (if such a thing exists) are usually the result of not knowing how the technology works; and these examples might, therefore, have been included in section 2 above. However, there are different elements that contribute to inhibition. For example, people experiencing audioconferencing and videoconferencing for the first time may not know that it is really a limited, 'closed circuit' technical configuration. They think that these forms of communication are like broadcast radio and television and that the whole world can hear and see them. However, when they find out that the sites involved are limited and that the

people at those sites, who are probably very well known to them, are the only ones online they become quite relaxed. Indeed they soon seem to lose their inhibitions, as will be explained below.

With regard to email discussion groups or lists there are at least two reasons why people are inhibited in terms of asking questions or making comments. The first is that they may be seen as stupid by others in the group. The second is that individuals feel that they are intruding on an existing 'in group', and this compounds the first feeling. The following quotes from the journal of a fourth year Bachelor of Education student illustrates this.

> An interesting barrier to my own participation that 1 observed was a desire to know who was on the end of the line when I was 'speaking'. It is possible that an inability to participate in the early weeks of the program has limited my knowledge and not that of other participants. The lack of any knowledge about the other participants was disturbing and I found myself not wanting to contribute as 1 was not sure what reception I would receive. In face to face communication, this has rarely been an issue, so it was interesting that it should be an issue for electronic communication.
>
> Upon reflection the absence of any verbal or non verbal feedback as to how your comments are being received was a large barrier for me. Also the contribution is in writing for all to refer to, and or print, and whereas a foolish comment or naive opinion when spoken, is soon forgotten, when it is sent on electronic mail, it is in writing and seemingly more permanent.
>
> One last reason for the lack of interaction with this community, on my part, was due to one or two of the early comments by other participants in which they seemingly criticised another student's behaviour during an ordinary lecture or tutorial. This did not entice me to contribute lest I was treated to the same comments. While it is beneficial that the other students did try to get interaction moving, these comments did interfere with my desire to participate, (unpublished QUT BEd student journal, 1997)

This same 'in-group out-group' phenomenon was observed in two other discussion lists of rural women, Wechat (a closed list) and Welink (an open list).

Disinhibition

Over ten years ago in the USA, a rather large company noticed a significant drop in business - large customers were not renewing purchasing contracts. An investigation was carried out to determine the cause of this slump. It was discovered that the receptionists were sending anonymous, rude email messages to key people in the client organisations as revenge for the rude way in which they had been

treated on the telephone by these people. This was out of character for the receptionists, and the phenomenon was dubbed 'disinhibition'.

Since hearing that story, I have observed this phenomenon in all forms of teleconferencing and email. For example:

> During a training program on audioconferencing for telephone operators, a simulation game involving a low level of competition was set up across four groups. The task was to negotiate a satisfactory outcome via audioconference. However, one of the operators decided to filibuster the game and spoke in a loud and aggressive tone of voice from one of the sites for 20 minutes without drawing a breath. The comment at the end was: 'I don't know what came over me! I'm not usually like that!'

> A videoconference trial was being held over a period of a week for government public servants between Brisbane and Townsville, a provincial city in north Queensland. During that week several examples of disinhibition were observed. One in particular involved the State Police. The purpose was for senior officers in Brisbane to meet via videoconference with some relatively new recruits and their mentors in Townsville to determine the effectiveness of the new training program. The four officers entered in full uniform and when this was spotted by the new recruits, they became rather terrified, and one young female, in particular, whispered: 'Look at all that brass!' The facilitator at the Townsville site hit the mute button, and attempted to calm them down and explain their fears away. The videoconference session subsequently went for approximately 30 minutes and during that time the female recruit became increasingly assertive in her conversation with the senior officers to the point where, when one of the officers said he would be visiting them in Townsville next week, she cheekily responded: 'Don't hurry!'

> Flaming on email is probably another example of this phenomenon. At QUT an acting head of the business studies department put an email message out to students along the lines that due to the increased demand on the computing labs there would have to be introduced a set of guidelines regarding access, the length of stay, booking procedures and so on. The message was rather matter of fact, but it drew some of the most vitriolic, racist and foul responses from dozens of students that anyone could imagine. It seemed to trigger some latent issues within the students and, because of the disinhibition phenomenon, they did not hesitate to respond in this way.

Face-to-face, the people in these examples would be far more polite. It is not known exactly why behaviours change in this way, but perhaps it is because they realise that the person at the other end cannot reach across and punch them in the nose. This could prove to be a fruitful area of research.

Individual Interactions and Group Dynamics

Individual perceptions

People conjure up images or fill in 'gaps' in their perceptions when there is no vision or when that vision is distorted as a result of the electronic communications technology. The following two examples illustrate this.

> An online email list has been created in Queensland called Wechat, 'Women's' Electronic Chat', as part of a research project to look at the impact of the use of communication and information technologies by rural women. Many of the people on this list, including two of us men who are part of the Research Team, have not met each other face-to-face. However, recently there was an opportunity for two women, 'SL' and 'CC', who had become very friendly online to meet. SL sent the following message to Wechat after the meeting:
>
> I'm going to tell a little joke about 'CC' and hope she'll forgive me. The first thing CC said to me was, "I didn't think you were so tall!" Well, CC, I know why that is. When I am using the computer I am always sitting down!!!

To which CC replied:

> My ingenuous comment to SL re her height has got me thinking about why we picture people a certain way from their emails. I had this discussion las year with KC (on email)who flippantly said something like she really was blonde (she has dark coloured hair) when we first met after email contact. I have now had the experience of meeting several people I have had email contact with and for some reason SL wasn't quite what I pictured.

And so continued a rather lengthy discussion over a few days about how we picture people before we meet them face-to-face.

Another report came from Mount Isa Mines in northern Queensland. The Human Relations section conducted over 100 interviews during 1995 for staff recruits using videoconferencing. The person in charge said that it was consistently their experience that people look older on videoconferencing than they do face-to-face. Like some of the other human factors reported here, this may well be the result of technical aspects such as camera quality and lighting.

Group dynamics

Group dynamics in face-to-face situations have been a topic for study for many years. However, the dynamics become somewhat different when mediated through electronic communications.

A major technical innovation using videoconferencing for vocational training was introduced in Queensland, Australia, in 1995 and was called 'Videolinq'.

Several Technical and Further Education (TAFE) institutes were supplied with room systems and encouraged to trial teaching and administration applications. One institute had recently established a second campus 100 kilometres away and courses were being taught on both campuses by teachers travelling from the main campus about once a week to the second site. This seemed like a natural setting for the use of videoconferencing so that the classes at both sites could be taught simultaneously.

One such class involved 'personal development' and the teacher volunteered to use videoconferencing. The student responses, however, were something other than what was expected. Because each of the two groups had already developed a strong rapport with the teacher, when both groups became involved in a synchronous session each saw the other as an intrusion on that relationship. The intensity of the animosity was not allayed when the lecturer travelled to the second site to be there personally on alternate weeks. When the Research Assistant visited the groups they almost physically attacked him, blaming the videoconferencing technology and asking him to take it away. The situation continued to deteriorate until the students boycotted the videoconferencing sessions and the teacher had to resume travelling. (Lundin and others, 1995)

A similar situation occurred when videoconferencing was used with a Master of Education group. During 1994, two Queensland University of Technology lecturers trialed and evaluated the effectiveness of videoconferencing to deliver a specific subject from the Brisbane campus to a group of eight mature-age students located in a provincial centre three hours drive from Brisbane. This was a well-established group in that they had studied the same subjects together for the previous three semesters. While there were only the two lecturers in Brisbane, the interactions were relaxed, spontaneous and lively. However, attempts to bring other students enrolled in the same subject on-campus (evening, part-time) into the Brisbane site, with the expectation that this would add to the richness of the discussion, it was seen by the remote site students as an intrusion.

In 1995, another group in the same subject comprised three students from Hong Kong, one from Papua New Guinea and one European-Australian. There was a period of bonding of this culturally diverse group during six weeks on-campus after which two of the Hong Kong students returned home. Videoconferencing was then used to continue this group's activity for the rest of the semester, and they all still felt part of the group. The interactions became quite interesting, particularly in terms of the disinhibition discussed above:

> However, the Hong Kong students also found that they had to make a fundamental change to the way in which they interacted with their lecturers and fellow students. It is not usually within their culture to question lecturers and/or debate issues presented. Although they encounter this shift in operation in a face-to-face situation, they can often 'disappear' in the class group and not enter into discussions. The approach taken by the lecturers coupled with videoconferencing with such a small group of students acted

as a catalyst, enabling them to spontaneously and voluntarily participate in the discussion mode. They adapted to this well and enjoyed the chance for interaction that videoconferencing offered.

This change to basic interactive patterns was the only cultural issue which was evident during the videoconferences. Concerns about English as a second language and any effect on this by the technology proved to be unfounded, with all students communicating freely and easily with each other. The students in Hong Kong became proactive in discussions and exhibited a lack of inhibition often referred to as 'disinhibition'.

A feeling of 'oneness' was observed within the group, overcoming the great geographical distance between them. Of particular interest was the comment by one of the students in Hong Kong. When asked during the debriefing session whether they had felt left out when the Brisbane group was discussing an issue among themselves, the reply was that they did not, they felt very much a part of the group because the Brisbane site had a blue wall as did they in Hong Kong.

This comment was given in earnest, and provides an interesting insight into the psychology surrounding videoconferencing and the importance of room design in promoting interaction. Although not the focus of this study, room design clearly has an impact and is a topic for further study. (Burke, Daunt & Lundin, 1996)

This leads rather neatly into the issues of intercultural communications.

Intercultural Dynamics

The rapid globalisation of education, particularly through the use of communications technology, leads to at least two major cultural/ethnic concerns: first, the dominance of the 'have' countries over the 'have nots (educational invasion), and, secondly, the need for sensitivity in intercultural communications, especially in the design and delivery of distance learning programs.

With regard to the first of these, to quote Rossman (in Murphy, 1994), the countries of the developing world need special attention to ensure true partnerships are realised and educational invasion in the negative sense is avoided:

My own distance education priority is the developing world. As we try to assist Third World people in developing their own distance education, I'd like to see us have some international partnerships. These partnerships should result from trying to solve basic world needs: adequate food and health care, adequate education, and jobs for everybody in the world. Distance educators should find a way to focus on such crucial needs. Research on solutions to such problems will require international partnerships or teams across all kinds of national and cultural boundaries

> to define a problem, discover alternatives, and explore the consequences of various actions. In other words, international distance education should empower 'collective intelligence', the bringing together of many minds to work on specific global-scale issues. This strategy is possible with the new communications technologies. (Rossman, in Murphy, 1994, 72)

With regard to the second intercultural issue — communication, it would seem critical that the production and delivery of distance learning courses need toi be culturally sensitive - and congruent with the culture of the clients. For example, for most subject areas, simply sending western culture type materials to students in Asia does not seem to be appropriate without some translation.

Intercultural or cross-cultural use of various forms of media have been the subject of research reported by people as Korzenny and Ting-Toomey (1992) and Lester (1996). These and many other research findings are summarised and reviewed by Biernatzki (1995) in an issue *of Communication Research Trends* devoted to "Intercultural Communication'. For example, with regard to ethics, Cooper (in Korzenny and Ting-Toomey, 1992) found that there is a fairly substantial common ground for the establishment of an ethics of mass media applicable to many or most cultures. Lester, however, found that in much of the media there was considerable ethnic stereotyping based on limited knowledge of the producers of the programs about various ethnic groups.

Casmir (in Korzenny and Ting-Toomey, 1992) provided some of the most interesting insights with regard to this issue in terms of a 'Third Culture' which is developed through cross-cultural communications:

> Despite some cross-cultural commonalities, cultural differences not only remain, but remain extremely important as barriers to easy understanding among people of different ethnic backgrounds. Fred Casmir, in his epilogue (Korzenny and Ting-Toomey, 1992, 247 - 262), felt it necessary to stress this point, lest the ideal of a 'global village' be too easily accepted by readers impressed by the cultural similarities highlighted by some of the book's other contributors.
>
> Casmir emphasises that 'in many instances specific types of media consumption or use result, regardless of the intentions of those who present material to their viewers, readers or listeners' (p 250). He feels that the focus of intercultural media use studies should be on the interaction between viewers and the media. In this process, 'third cultures' are constructed which use materials from both the interacting cultures to fill locally and temporally defined functions outside both cultures but are intelligible to the participants from both who are involved in that particular interaction. (Biernatzki, 1995,7)

This notion has considerable implications for global educators and third 'third culture" would seem to be a far more palatable outcome than educational invasion or the melting pot of a 'supra culture".

Being Unreal and the Future

What the future holds for education in terms of the use of the various technologies is, of course, the subject of a great deal of conjecture. There are issues relating to validity of information, the nature of reality, the potential for sabotage, being anonymous, 'genderless', 'ageless' and even 'non-human" through the use of avatars, bots and other forms of Internet software.

Carol Parker (1997) articulates the unreality of the online experience as follows:

> I felt my on-line identity was quite separate from my day-to-day existence. I treated Worlds Chat as a game, and enjoyed the theatrics of donning my avatar. On-line, 1 could be who I wanted to be: young, beautiful, tough, witty, the all-round party girl, almost like stepping back in time to my single days.
>
> I believed I was having fun, and that was all; the actions and words that happened in cyberspace were separate from my real life.

Computers - we will probably be wearing them and this will provide a whole new set of interface implications not yet realised. Given the convergence of technologies and the development of universal communications and data bases, it is becoming possible for learners of all ages to initiate their own educational pathways and learn what they want, when they want, where they want; the ideal of open learning.

> A university lecturer, when marking her students' papers, found references to writings by key people in the field, but she had not yet read these articles. When she asked the students where they came from, they replied: 'The Internet!' She dubbed this 'feral learning'.

As Parker Rossman indicates, there are more questions than answers at this stage with regard to 'free trade' of higher education:

> The agenda for global higher education begins with questions about who is to coordinate and regulate electronic courses offered on network or satellite; who is to set standards, especially when nations and universities disagree; what technology is to be used and how can it be shared; and who is to arbitrate and decide on such matters as degrees and exchange of course credits. Also, what kind of administration and funding can a worldwide electronic university have if it involves many governments, private colleges, and the teaching programs of business corporations (Rossman, 1993, 13)?

There is increasing interest in the notion of megauniversities (e.g. Daniel, 1996) coming into existence with staff and students drawn from the global network. This represents the shift from the university (or school) being a bricks and mortar place to the learner being able to say: 'I am my school' or 'I am my university'. This indicates empowerment of the learners to control their own destiny and provides Rossman with most of the answers relating to the problems of control. The implications of the learner now being able to draw on multiple sources for their coursework, to request recognition for prior learning and to demonstrate competencies through private agencies means that the whole notion of what constitutes an educational institution, versus a community of scholars, needs to be addressed.

The idea of wearing our computer may seem one more step towards our living totally within the machine. In which case let us hope the final scenario is not like this:

> Vashti was lecturing at the time and her earlier remarks had been punctuated with applause. As she proceeded the audience became silent, and at the conclusion there was no sound. Somewhat displeased, she called to a friend who was a specialist in sympathy. No sound: doubtless the friend was sleeping. And so with the next friend whom she tried to summon, and so with the next, until she remembered Kuno's cryptic remark, "The Machine stops."
>
> (E. M. Forster, The Machine Stops, 1928)

References

Bednall, D. (1995, October). Desktop videoconferencing: Implementation issues. *In Proceedings of the Third Annual Conference of the Australian Teleconferencing Association,* Sydney, IIR

Biernatzki, W. E. (1995). Intercultural communication. *Communication Research Trends.* 5(4) (Whole issue)

Burke, C., Daunt, C. & Lundin, R. (1996, December). Videoconferencing in an MEd program: A case study in flexibility and empowerment. In *Open Learning '96.* Proceedings of the 2nd International Conference on Open Learning, Brisbane, Australia. Brisbane.

Casmir, F. (1992). Epilogue. In *Mass media effects across cultures,* Korzenny, F. and Ting-Toomey, S., Newbury Park, CA/London/New Delhi: Sage.

Cooper, T. W. (1992). A comparative study of national media codes of ethics. In *Mass media effects across cultures,* Korzenny, F. and Ting-Toomey, S. (Eds.), Newbury Park, CA/London/New Delhi: Sage.

Daniel, J. S. (1996). *Megauniversities and knowledge media: Technology strategies for higher education.* Kogan Page.

Dykstra-Erikson, E. & others (1995). Supporting adaptation to multimedia desktop conferencing. *Proceedings, 15th International Symposium on Human Factors*

in Telecommunication, pp 31-38. Melbourne: iHFT

Forster, E. M. (1928). 'The machine stops'. In M. Ross and J. Stevens (Eds,) *Eighteen stories.* Vancouver: Dent

Korzenny, F. & Ting-Toomey, S. (Eds.). *Mass media effects across cultures:* International and Intercultural Communication Annual, Volume XVI. Newbury Park, CA/London/New Delhi: Sage.

Lester. P. M. (Ed.) (1996). *Images that injure: Pictorial stereotypes in the media.* Westport, CT/London: Praeger.

Lundin, R., Simpson, T., Hansford, B. & Skippington, P. (1995). *Videolinq evaluation - final report.* This evaluation report was prepared by the Queensland University of Technology for TAFE Queensland, Department of Employment, Vocational Education, Training and Industrial Relations. Brisbane: QUT

Moore, M. G. (1993). Free trade in higher education. *The American Journal of Distance Education,* 7(3), 1-7.

Muhlbach, L., Bocker. M. & Prussog, A. (1995). Telepresence in videocommunications: A study of stereoscopy and individual eye contact. *Human Factors.* 37(2), pp 290-305.

Murphy, K. L. (1994). Speaking personally with Parker Rossman. *The American Journal of Distance Education, 8(2),* 72-76.

Parker, C. (1997). *The joy of cybersex.* Reed Books

Parker, L. (1984). *Teletraining means business.* Madison, WI: Center for Interactive Programs, University of Wisconsin - Extension.

Rossman, P. (1993). *The emerging worldwide electronic university.* Westport, CT: Praegar Publishers.

Smiley sources on the Internet:
<http://www.bic.mni.mcgill.ca/system/world/BigDummy/bdg_46.html>
<http://www.netlingo.com/smiley.html>
<http://clinfo.rockefeller.edu/maiiual/sminet.htm>)

AUTHOR

Roy Lundin is Senior Lecturer at Queensland University of Technology, Australia