

**IS THE INTERNET FOR EVERYONE?
ART IN SEARCH OF A BETTER CONNECTED SOCIETY**

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In recent years the Internet has often been associated with the notions of progress, improved quality of life and greater democracy. Nonetheless, research shows that – with rare exceptions – only the apex of the social pyramid in each community is connected to the Internet, totalling a paltry 7% of the population of our planet. “Unless we ensure proper capillary penetration and are creative in introducing alternative forms of universal access, we shall be helping perpetuate inequality and violating the essential right to communicate” (Afonso, 1999). At the Electronic Arts Unit, at PUC-Rio University, we run a series of research projects on social issues: our project “Internet, illiteracy and social exclusion” focuses on the emerging actors inside, at the fringe or outside the Net society. The projects’ site shows how 120 people living in different social-economic circumstances in Rio de Janeiro perceive and understand the Internet, how it affects their lives, and its implications for their future. It also encourages users to send their opinions, images and ideas so that they become part of the site’s data bank, in a very dynamic and intriguing way. In this paper, we present and discuss the results of this project, and the advent of what we call the “net-social-diversity”.

From New World to Third World: what changes with the Internet?

A curious parallel can be drawn between the era of the great sea voyages – when a number of European countries set out to conquer the new World – and what is happening in the present day as a result of the spinning of the World Wide Web of computerized communication [1].

Just as happened half a millennium ago – when the countries that had mastered the technology and know-how necessary for long-distance sailing drew a new map of the world, full of colonies of continental proportions – so today, a few developed countries are increasing overwhelmingly their potential for influence, their wealth and their consumer markets in relation to the communities inhabiting what we no longer call the New World, but the Third World.

A number of studies show that the increasing spread of the Internet and the World Wide Web – a new kind of navigation initiated only a few years ago – are accentuating socio-economic inequalities among nations and groups on our planet, and are once again redrawing our world map [2].

Today certain communities have the resources and knowledge with which to conduct leading edge research in this field. They hold the rights to, and control the generation,

distribution and production of, technology goods and they have – or are investing to obtain – the necessary technological infrastructure to put these goods to work. In the last analysis, they have the access and the opportunity to make full use of the potential of this gigantic information and communication network and to benefit more and more from its proliferation and expansion. On the other hand, certain other communities merely have access to the Internet, but not the capability to harness its potential fully or even partially, for lack of appropriate infrastructure, and of resources and investment in either technology and science, or education. Meanwhile, there are even communities that have no access at all to this technology – and no prospect of gaining access in either the medium or long term.

According to the 1999 United Nations Human Development Report [3], “writing computer programmes and revealing genetic codes have replaced the search for gold, the conquest of land and the command of machinery as the path to economic power”. The report describes how the privatization of scientific research and the constraints of intellectual property rights – which raise the cost of access to new technology – are sidelining poor countries and threatening their interests. It warns of the undemocratic nature of the Internet, which favours only certain groups and excludes the rest: “Current access to the Internet [... divides] educated from illiterate, men from women, rich from poor, young from old, urban from rural”. This imbalance, it continues, will not be corrected by market forces: rather, for this to happen, there is a need for rapid, energetic measures, which in turn involves issues ranging from expanding the infrastructure of connectivity in developing countries, through to, for instance, instituting a form of taxation on Internet use, revenue from which could be used to invest in extending the network’s benefits to all [4].

That the Internet has far-reaching democratic potential is refuted by theoreticians who believe the endless growth of information and the new transnational reference horizons thrown open by the Internet have not made transcultural relations easier or expanded anyone's understanding of other people, but have more often led to the mere repetition of “binary, manicheistic schemes that divide the world into rulers and the ruled, modern and traditional, centers and peripheries” (Canclini, 1998, p. 2).

Quéau (1998) highlights the danger of using expressions like “global society” and “universality”. For him, globalization is not universal, since it does not affect everyone in the same way. The concept of “global civilization” is simply the projection of a privileged minority (the “manipulators of global symbols”), a small fraction of the planet's inhabitants. “The great majority of people do not understand the concept of globalization or even benefit from it, even when they in fact support its consequences and are directly or indirectly – but truly – affected by it” (p. 1). Jérôme Bindé, who directs UNESCO's Analysis and Forecasting Division, claims that countries located to the south of the planet are less worried about access to information highways than about developing basic infrastructure, including telephony, which is the very key to accessing the Internet and cyberspace technology. “Four fifths of the planet still has no telephone today” (Bindé, 1998, p. 3).

South Africa is the African country where the greatest number of people have Internet access, but many hospitals and around 75% of schools have no phone line. Even at universities, when they do have an Internet connection, contingents of up to 1,000 people depend on a single terminal to connect. “Information is only one of many needs”, says the UN report. “Email is no substitute for vaccines, and satellites cannot provide clean water. High-profile technology projects risk overshadowing basic priorities” [5].

A number of authors take the rather optimistic view that communications network technology creates radically new conditions for society. Many theoreticians feel that the Internet is causing individual and cultural expression to flourish, along with democratic access to information. Weston (1997) says that the Internet gives a large number of

people the wherewithal to speak for themselves in public. He thus considers the Big Net a "techno-social accident" which caused an ironic turnabout from the way historically centralized communications technologies shaped modern social relations – where the few held decision-making power over what information could be broadcast to the many: "As soon as it was clear there was not enough band width for everyone to send their smoke signals or drum rolls, we have organized and re-organized to ascertain who could – and who could not – put their hands on the blankets or the drums – and on the printers, the microphones and the cameras. (...) Until very recently there was no reason to imagine that some day we would be questioning the abundant access to the means for producing, exhibiting, distributing and reproducing cultural goods. Suddenly it's time to begin imagining these situations. This is the big issue for the Internet" (Weston, 1997, p. 195).

For some writers, not only can the Internet transcend geographic, social and political barriers as a means for exchanging ideas; in its present unregulated form, it can also circumvent enforcement of certain laws, rules, customs and morals (Mehta and Plaza, 1997, p. 161).

For Lévy (1998), cyberculture reflects the moment at which our species, by economic globalization and by densifying communications and transportation, is tending to create a world community, even if that community is rife with inequities and conflicts (p. 10). For this author, the paradoxical essence of cyberculture is a universality that lacks any central meaning, a system in disorder, a labyrinthine transparency, an immense act of collective intelligence. Cyberculture embodies a new kind of universality: "universality without totality" (p. 6). On the assumption that technology is a particular dimension of collective becoming, Lévy (1993) also believes that "techno-democracy" is possible. For the necessary changes in politics to become possible, he holds, one key element is for the technical options to be fully integrated into the process of democratic decision-making: "To become a techno-democracy, all techno-politics has to do is to take place in the public scene as well, where the actors are equal citizens and where the rule of the fittest does not always prevail" (p. 196).

Others feel that the Internet is expanding the locus of day-to-day, direct, self-mediated political involvement: "Those who previously had to have themselves represented by way of agents of mass communication, now begin to represent themselves. What was previously local, domestic, idiosyncratic and private can, for the first time, become external and public" (Weston, 1997, p. 197).

The digital economy leveraged by the Internet has been defined as the first economy in the history of capitalism to make it easier to overcome spreading the proliferation of social inequality, by allowing minority and underprivileged groups to become part of the producing class, and not just of the consumer class. "As a result of its non-hierarchical structure, anyone can join it and start their own business", declared Michael Powell, member of the United States Federal Communication Commission, recently [6].

Yet in a world like today's – marked by dramatic social, cultural and economic disparities – is it really possible for "anyone", as above, to start their own business on the Internet and become part of the producing class?

The media increasingly convey a democratic and globalizing image of the Internet, along with discourse that would lead one to believe in the possibility that it will include many, if not all, of us. Today however – with extremely rare exceptions – only the very apex of the social pyramid is connected to the Internet, totalling a paltry 5% of the population of our planet [7].

How can one hope to include a substantial proportion as Internet users – in the short, medium or long term – so as to make the Web truly global, when the financial, technological and educational obstacles facing countless communities are of such an order as to preclude even the minimum conditions necessary for survival? How can one hope to extend the benefits of the Internet to them – unless in rhetoric, ignorance or irony – when so many have neither housing nor food, sanitation, clean drinking water, literacy, electric light or telephones? Is it to be a case of: "They have no bread. Let them eat cake!"?

Factors like wage earnings, level of schooling, age, ethnicity, nationality, sex and language all contribute to defining who has a chance of being part of the information society, and who will be excluded – partially or wholly – from the benefits of this new form of social organization, and from this new world map now being drawn.

For Quéau (1998), the quest for the "common good" – universal ethics and moral awareness, beyond geo-political borders or the specific interests of certain groups or contexts – is our greatest present challenge, since the "common good" will only be brought about by mankind's acting jointly and in common to achieve it. Instead of a "global world," what we really need is a "common world". For this author, the unity of the human species cannot be based on a single religion, philosophy or form of government. It must be based on multiplicity, on diversity. Globalization, which imposes a simplified form of unification, has thus threatened the basis for building solid human unity: "The blue planet seen from the satellite appears united, but fragile. The Internet planet also appears united, thanks to the 'universality' of the TCP/IP protocol and HTML language. Yet global social consensus is still more fragile than the ozone layer" [8].

Internet and social exclusion: a gaping chasm

It took 38 years for radio audiences to reach the 50 million mark, 13 years for television to reach 50 million viewers, 18 years for personal computers to enter the daily lives of 50 million users, but only 4 years for the Web to net 50 million surfers.

The Internet is unquestionably the fastest-growing medium in human history. The number of people worldwide connected to the Internet today is estimated at 378 million, and the forecasts point to a total of more than 700 million users in 2001 [9]. As impressive as these numbers may appear at first sight, however, surveys of the Internet must also be analyzed in terms of issues of infrastructure and access, technology research and development investment and funding, government human resource capacity-building policies, means for the production, exhibition and distribution of information, and other factors in the various countries and communities.

Canada and the United States alone – home to only about 5% of the world's population – account for around 50% of all Internet users, while South Asia, where some 20% of the world's population lives, houses less than 1% of those connected to the Big Net [10].

There are more computers in the United States today than in all the other countries in the world together. In June 1999, 110 million United States citizens (around 41% of the total) were connected to the Internet. When the world's ten largest economies, by GDP, are ranked by number of Internet users, the US is followed by Japan with 16 million users, Great Britain with 14 million, and Canada with 12 million (Afonso, 1999).

A survey by Network Wizard showed that, in Finland, one in every 11 inhabitants is connected to the Internet, while in the United States the proportion is one in 15. In Great Britain, 1 in every 59 people is connected to the Internet, and in Germany the ratio is one to 83. In China, Internet use increased 324% in 1999 – going from 2.1 million users in 1998 to 8.9 million in 1999 [11].

Although Brazil stands out as one of the developing countries where Internet use has grown most in recent years, in June 1999, a total of 3.3 million Brazilians – that is, barely 2% of the population – had an Internet connection [12]. Six months later, in December 1999, studies pointed to a contingent of 5.1 million users in Brazil, still far less than 3% of the population, today estimated at 165.3 million by the Brazilian Geographical and Statistical Institute (IBGE).

The number of Latin Americans connected to the Internet went from 4.8 million in 1998 to 7.5 million in 1999 (half of them in Brazil), according to a study by International Data Corp, which forecasts that by 2003 the number will rise to 19 million Net surfers. The analysts suggest that the Internet's growth potential in the region is very great, despite the lack of telephone lines, an average per capita income of only US\$4,000 per year, and the resulting difficulty of purchasing a computer, which costs an average of more than US\$1,000. Some details are unexpected, such as the average length of time connected to the Internet in Latin America, which is 8.2 hours per day, as opposed to a US average of 7.1 hours. Sales via the Internet in Latin America are expected to rise from their present level of US\$167 million to US\$8 billion in 5 years (Scofield Jr., 1999).

However, the issue cannot be discussed solely in terms of overall results and statistics for each country. Take the United States, for instance: as in several other industrialized countries, enormous disparities in Internet access, control and use can be observed there between different segments – as a function of ethnicity, race, socio-economic situation, education, gender or age. The phenomenon known as the “digital divide” has been growing over the years: that was the conclusion reached by the United States Department of Commerce, as presented in its second report on the state of Internet development in the US, released in August 1998. The study found marked differences in Internet use between white, Afro-American and Hispanic families. Of families in the USA with Internet access, 40.8% are white, 19.4% are latino and 19.3% are black. More serious still, the study found that people belonging to the minorities were even less likely to own computers or to have access to the Internet when they lived in rural areas. The gap between white and latino families in terms of access to the new technologies has widened significantly. According to the report of the conference “Falling through the Net: defining the Digital Divide”, organized by the United States Department of Commerce in December 1999, wage level is a strong determinant of an individual's or a family's potential for Internet access. “For those at the lower end of the income scale (\$5,000-9,999), 12.1% use the Internet (...). This contrasts with 58.9% of those in the highest bracket (\$75,000+) accessing the Internet...” In addition, this indicator also affects where and how a person uses the Internet: “persons with incomes of less than \$35,000 use the Internet more often outside the home, while (...) those earning \$35,000 or more annually” access the Internet mainly from home. “The digital divide” in terms of access to the Internet “between those at the highest and lowest income levels grew 29 percent”. The report also showed that level of education plays an important part in determining the likelihood that a person will have a computer and Internet access. College graduates are more likely to have access to the Internet at home or at work than those with lesser educational accomplishments. While 61.6% of those with four-year college degrees use the Internet, least usage (6.6%) occurs among those persons with an elementary school education or less. “Those with a college degree or higher are more than *eight times* as likely to have a computer at home (...) as those with an elementary school education. In rural areas, the disparity is even greater. Those with a college degree or higher are more than *eleven times* as likely to have a computer at home (...) and are more than *twenty-six times* as likely to have home Internet access (...) as those with an elementary school education” [13].

Nonetheless, industrialized countries have shown they have the means to reduce or even eliminate these discrepancies, if they wish. Last month, as part of the Technology

Opportunities Program (TOP), the US Department of Commerce announced funding of US\$12.5 million for local governments and non-governmental organizations in the United States to invest in small organizations providing services to the most underprivileged rural and urban areas. The purpose is to narrow the existing gap between US citizens who have Internet access for purchases, research and business, and those that do not. Since this program was set up six years ago, it has channeled more than US\$135 million into projects that make practical use of telecommunications and advanced information technology.

In his opening address to the Digital Divide conference, in December 1999, the President of the United States said: "I just ask you all to think about this one thing: What do you believe the economic impact would be if Internet access and usage were as dense in America as telephone access and usage. I think it's clear that we need to keep working until we achieve this goal." He concluded by calling on all those present to participate in this "great national endeavour": "Together we have the power to determine exactly what we want the Internet to become, and what we want it to do is to be an instrument of empowerment, education, enlightenment, and economic advance and community building all across America, regardless of the race, the income, the geography of our citizens" [14].

While the industrialized countries are seeking ways to bring their citizens into the computer network by investments and political action, the gap seems vast – and in many case probably unbridgeable – to those on the technologically less-favoured side, in the Third World. The ethics, the rules and the interests that govern the Internet's development today have devastating implications for the developing countries: "In private research agendas money talks louder than need. (...) The rush and push of commercial interests protect profits, not people, despite the risks in the new technologies" (UN Human Development Report 1999, p.57).

Is the Internet undesirable technology then, something harmful and destructive that should be rejected by technologically underprivileged countries? Or is the Internet the technology with the greatest democratic potential mankind has ever developed, technology that, at its present volume of one billion documents on-line, affords free and indiscriminate access to the most complete storehouse of information ever accumulated?

The transcultural challenge of the "common world"

Those who see the Internet as a *locus* for democratic access to the acquisition and distribution of knowledge, or as a new public, participatory space for transcultural and international communication, seem to have embraced a narrow, simplistic view of the process of communication, ignoring the diversity of social contexts in which communication takes place as well as the notion of meaning as a social construct.

Intercultural communication is a field of study which investigates verbal and non-verbal interactions between individuals with diverse behaviour patterns based on their different life histories and in their different cultural contexts.

Trillo (1997) states that subjects involved in the activity of communication always bring with them a repository of group experiences, knowledge and values, which vary depending on their cultural background. When these repositories are different, one can say that intercultural communication is taking place (p. 1).

What then would be the ideal way for the cultural groups and communities currently left out of the Internet, gradually to be incorporated – but without harming them? As we will see, opinions differ as to the possible results and the implications of the process of global computerization, and the impact that the Internet will have on cultural minorities.

Several authors have used the prism of intercultural communication to discuss the vulnerability of minority cultures in the light of globalization. What is Lévy (1996) believes that the "brutality of cultural destabilization" should not blind us to socially favourable emerging forms, whose development should be enhanced. Emerging new forms of communication for de-territorialized collectivities – including chats, electronic forums, groupware for cooperative learning and so on – represent a decisive advance towards collective intelligence. These the author calls "all-to-all communication", as opposed to the classical forms of "one-to-all" communication in which information comes from one broadcasting center to "passive receivers, isolated from each other" (Lévy, 1996, p. 113).

For Bindé (1998), on the other hand, the opportunities offered by the technological revolution – simultaneous participation by all cultures on a global scale, the chance to dialog in real time across geographical borders – are simply the sunny side of a much more insidious process which is progressively being inflicted on the mainstay of cultural minorities. This author suggests we look critically at the flow of information on the Net and ask: "Who informs whom?" In fact, of the present one billion documents available on-line, 86.55% are in English, 2.36% In French, and only 0.54% in Dutch (NUA Internet Surveys, 1999). According to Bindé, "Behind the gratuity of information on the Internet and the facility of access to sites, we must recognize the expression of dominant cultures, which use the new technologies as vectors of their supremacy. Post-modern wars will be waged on a new territory: that of information and communication, the place where the decisive battles will be fought" (p. 3).

Will the Internet thus be the information society's Tower of Babel? Will it be a quest for unification, power and supremacy that will end up scattering men ever further upon the face of the earth, as described in the Biblical passage? Should we, taking a lesson from our ancestors' failures, resist its potential? How, on the other hand, could we pass up the opportunity for intercultural contact made possible by the advent of this new technology? How can we deny the desire for communication with others, the feeling of estrangement, even at the risk of cultural homogenization?

Some authors see the possibility of culture shock giving rise not to "a planetary monoculture" [15], but to brand new cultural syntheses and novel intercultural forms. It would be as if a new cultural diversity were in the throes of creation and development, enhanced by conditions supplied by the new technology. "This new cultural diversity would be joined with the pre-existing cultural base, with that diversity which has been in the making for centuries" (Bindé, 1998, p. 3).

Yet, is it really possible – and desirable – that this happen?

There may have been a time in human history when people from different cultures used similar objects demanding similar skills and aptitudes to carry out the same kind of tasks and functions. From a present-day perspective, however – with technological progress rapidly and intensively widening the gaps between societies around the world – such an egalitarian view sounds at best ingenuous, if not absurd. Countries have now been categorized on the basis of their stage of technological development, quite apart from their natural wealth, their size, their people or their culture. The world has been divided into First and Third Worlds, and technology plays a key role in maintaining that segregation.

"In Cambodia in 1996, there was less than 1 telephone for every 100 people. In Monaco, by contrast, there were 99 telephones for every 100 people. A widely accepted measure of basic access to telecommunications is having 1 telephone for every 100 people – a teledensity of 1. Yet (...) a quarter of countries still have not achieved even this basic level. (...) At the present average speed of telecommunications spread, Côte d'Ivoire and

Bhutan would take until 2050 to achieve the teledensity that Germany and Singapore have today" (UN Human Development Report 1999, p. 62).

Most research and development in the new technologies takes place in developed nations. In 1996, while Brazil invested US\$10 per capita in research and development, the United States invested US\$507, Germany US\$576 and Japan US\$619 [16]. It is important to consider the international dimension of the development of computer technology. On a global scale, this can be seen in processes of technology transfer – from developed to developing countries – which exacerbate the problem of economic and cultural domination. Kaplinsky (1996) analyzes several aspects of the potential conflict generated by technology transfer. For him, any set of complex relationships amongst individuals or groups can generate misunderstandings and conflicts. In technology transfer, however, "the conflict does not just arise from the misunderstanding of the other's motives and intentions, but is intentionally built into the process". Kaplinsky's explanation for this is that the technology being transferred is the primary factor in generating profits: "Control over this technology is crucial, not just because it implies control over the generation of profits, but also as an important element for controlling the distribution of profits" (p. 197).

Laurel (1992), on the other hand, discusses the creation and design of computer environments and tools in the First World and their exportation to other countries, highlighting problems such as access and colonialism: "Should white heterosexuals from the First World create small, virtual terrariums for Blacks, Latinos and homosexuals, based on their own ideas and visions with regards to such cultures?" (p. 91).

Some people will, de facto, have a hand in creating, developing and controlling computer technology, while others will have to follow – and adapt to – the rules, design and logic established by the former group. It does not take a visionary to foresee who will belong to which group, since economics, technological progress and education have always been interdependent variables (Spitz, 1999).

Images in a distorting mirror

The so-called "modern lifestyle" of consumer society demands that a single model be adopted by developed and developing countries. This uniform pattern dictated by developed countries makes it harder – or even totally unfeasible – to generate alternative, differentiated technologies based on the social, cultural and economic parameters of each context, and ultimately leads to the Third World's being recreated in the image of the First.

According to a 1998 UNDP study, the world is experiencing an explosion of consumption, fed by the globalization of markets. "From 1975 to 1995, sales grew by 500% for TV sets in Latin America, 1,400% for cars in Eastern Asia and 400% for radios in Africa" [17]. Advertising is another consumption-related phenomenon: an average American watches 150,000 TV commercials in a lifetime. The global advertising market is estimated at US\$435 billion, and curiously Colombia is the country that spends the largest share of its GDP on advertising: 2.6%, or US\$1.4 billion. "The very definition of populations' need is changing, says the UNDP, making it ever more difficult to make out what luxury means" (Berlinck, 1998).

As early as 1993 Negroponte maintained that, "Today people are using computers as part of their daily routine. (...) There is not a human being in the modern world who currently uses less than 12 computers a day, from faxes to microwave ovens" [18]. While this is still not in fact the case for the majority of Third World inhabitants, there are forecasts that in the near future citizens of developing countries will have to face the digital challenge and interface with computers in many of their daily tasks.

Other forecasts go even further. Kevin Kelly, executive editor of *Wired* magazine, predicts that very soon digital money – a tiny chip laid into a conventional credit card, called a smart card – will replace bills and coins. "Instead of going to an ATM to withdraw cash, we will stick the smart card into a bank terminal and it will be loaded with a given value. When we buy something, another little gadget in a store or subway, for example, will unload it" [19]. For some, the entry of credit cards into the world of chips will drastically reduce the occurrence of fraud, and will be a tremendous technological leap. But what will the social impact of this change be in developing countries, which normally have a huge contingent of illiterate or semi-literate people who already find it hard to deal with current bank automation? Surprisingly, the smart card has already been tested in Brazil by various financial institutions, such as Bradesco, Banco do Brasil, Visa, Ceará State Bank, Master Card and American Express [20], clearly suggesting that – sooner than we might imagine – money will have been reduced to information carried virtually in a credit card: a difficult, abstract notion, hard to grasp for many.

So much the worse for us, citizens of the Third World, since, as Galeano (1993) suggests, "big cities in the south of the planet are like the big cities in the north, but reflected in a distortion mirror. Copy-cat modernization multiplies the defects of the model" (p. 15).

Created using parameters set in developed countries and designed to meet the needs of certain groups of users who belong to those contexts, computer technology is now impregnated with biases and values from the developed Western world that are built in to its architecture, interfaces and languages. Streibel (1986) identified several factors that contribute to the rule of certain cultural codes in computing. He stresses that, with their technology to manipulate data and symbols based on formal rules of syntax, computers tend to legitimize knowledge that fits into that structure, and deny legitimacy to other kinds of knowing, such as interpretation, intuition and introspection. For Streibel, computers demand that we be agents of forecast, calculation and control, even when we approach the world as active, constructive and intuitive subjects.

The expanding use of computers in developing countries – alongside dramatic levels of poverty, deprivation, social exclusion and violence – calls for careful analysis of the social and cultural specifics in each context, and discussion of the computer's impacts on less economically and technologically favored societies.

Take access to medical information in different national contexts. On average, a medical library in the United States will subscribe to 5,000 scientific periodicals; meanwhile, "the Nairobi University Medical School Library, long regarded as flagship centre in East Africa, now receives just 20 journals. (...) Developing countries suffer many of the world's most virulent and infectious diseases, yet often have the least access to information for combating them" [21]. In theory, access to the mass of medical information available on the WWW really could narrow the existing gap between these libraries, by affording a doctor in Africa or the United States access to the same data and information. Implicit in this description, however, is the idea that these two doctors – given the same information – could make equally effective use of its content or, in the last analysis, could treat their patients' illnesses with the same quality. This is the specious, distorted and mistaken aspect of the argument. Even given the same data, with access to the same accumulated knowledge, on the basis of the same information, even so these two doctors would still be facing entirely different situations in combating and treating their patients' ailments and diseases. As a health worker in Katmandu put it: "Our priorities are hygiene, sanitation, safe drinking water . . . how is access to the Internet going to change that?" [22].

Double Illiteracy

Ongoing and accelerating growth in computer use in developing countries – where illiteracy rates are often very high and constitute a major social challenge – may lead to an

increasingly critical situation. In contrast to other technologies like radio and TV – which are very popular in these countries due to their audio and/or visual content, which is easily apprehended by those who cannot read – computers are now a quite sophisticated technology, highly dependent on reading and writing skills.

One of the most damning findings by a recent IBGE survey of standards of living in Brazil was the number of children unable to complete elementary school: 8% of children between the ages of 7 and 14 are out of school. Worse still, 10% of Brazilian children from 5 to 14 are already working. "The cruelest statistics are from the Northeast, where 15% of boys and girls are in the labour market, with the child labour figure reaching one in four, that is 25%, in rural areas," according to Oliveira (1998).

This mass of potentially illiterate children and youth is part of the vast contingent of Brazilians – according to the United Nations fully 16.7% of the country's population – who can neither read nor write. Other sources which include those who have only very rudimentary notions of reading and writing set the mark at over 20 million people [23].

As Paulo Freire put it in his book *Pedagogy of the Oppressed* [24], literacy is not a matter of learning to read and write, but being able to say one's own words. Literacy goes beyond the mere ability to encode and decode abstract meanings, and centers on the ability to create meanings within an interpretative context. What matters in an inter-subjective dialog is the meaning of the content of the message, not just the mechanical repetition of words.

Research on the relation between schooling and proficiency (Paiva, Fontanive and Klein, 1998) in the Brazilian cities of Rio de Janeiro and Campinas found deeply disturbing results. Out of 2,057 tests done with individuals from 15 to 55 years of age, close to 75% of the population is at "the lowest level on the scales of prose, document and quantitative skills. (...) The majority of the population in that age range, on reading a simple informative text, only recognizes the topic, but is unable to differentiate a fact that is narrated from an opinion contained in the text, nor can they locate a piece of information in texts longer than 30 lines" (p. 7). The results also reveal that the same percentage can only add whole numbers and amounts of currency, but cannot, for example, add or subtract decimal numbers.

As if this dramatic scenario of functional illiteracy were not enough, the prospects for greater use of computer technology in the Third World also raise the issue of "computer literacy." Changes now underway in technological society, brought on by the globalization of capital and the re-ordering of politics, demand a population with basic training and specific abilities, including the capacity to communicate correctly in writing. "The complexity of today's world demands homogeneity in the population's basic training at a level that is no longer that of pure and simple literacy, in addition to downplaying the formalism of diplomas in favour of real skills that can be proven in daily life" [25].

Many countries are in fact witnessing the advent of a phenomenon that could be called *double illiteracy*, in which those who are already excluded from society as illiterates will now be totally excluded from the system, due to their lack of computer skills. Entire regions and populations in certain parts of the world are still not at all connected, or have been excluded from the social process of computerization, from the benefits of "collective intelligence" and from cyberspace's "universality without totality", in Lévy's (1998) terms. They could be called the *computerless*, an expression that may soon replace others like *homeless* and *landless*.

There is talk that the printed and electronic media will coexist peacefully, yet at the same time there is much effervescence at the possibility of "instantaneous distribution of

information" over the Internet. Santis (1996) suggests that "some foresee that, in a few years, paper will be a luxury medium" (p. 33). She states that the high cost of cellulose has led businessmen in communications to consider electronic distribution as a cost-cutting mechanism which will make trade in information more profitable. We can thus expect that, very soon, the *computerless* will have to either assimilate and join the digital logic or – if that is beyond their reach – live outside the system.

"Yet even if telecommunications systems are installed and accessible, without literacy and basic computer skills people will have little access to the network society. In 1995 adult literacy was less than 40% in 16 countries, and primary school enrolments less than 80% in 24 countries. In Benin, for example, more than 60% of the population is illiterate, so the possibilities of expanding access beyond today's 2,000 Internet users are heavily constrained" (UN Human Development Report 1999, p.62).

"It is clear that the poor of Africa will go on being proletarian, not because of the computer, but because they have nothing to eat", said Umberto Eco during a meeting to discuss humanizing globalization, held in Davos, Switzerland. He sees three classes of Internet users in the future: the proletarians, the petit bourgeois and the governing class [26].

Illiterate citizens in developing countries will be in the doubly unfavourable situation of not belonging to the First World – with all the technological advantages that this can mean – and of not being part of the select group of people in the developing world who can access and control the logic of the computer age, those who can learn to learn. The computer's integration into daily routines will be more hostile towards the excluded, since they will not be able to learn gradually, to make use of or to participate in the development of this new technology. The "computer illiterate" will not survive in a world mediated by computers.

What, though, does "computer literacy" actually mean? Does it mean knowing how to type with keys and to "click" on appropriate icons? Or does it assume an understanding of the underlying logic of computers as symbol processing machines? Can such a quality be measured in terms of knowing computer jargon or being able to deal with data input and output peripherals? Or might it be quantified in terms of skills in creating computer languages and codes to be shared with other members of the community?

The Aspen Institute Leadership Forum on Media Literacy and the Canadian Association for Media Literacy define "media literacy" as the ability to access, analyze, assess and produce communication in a variety of forms (quoted in Trillo, 1997). The American Library Association Presidential Committee on Information Literacy defines in greater detail what they consider information literacy: "To be 'information literate' an individual must recognize when information is needed and be able to actually locate, evaluate and use the necessary information. Ultimately, information-literate persons are those who have learned to learn. They know how to learn because they know how information is organized, how to find the information and how to use the information so that other people can learn from them" (in Trillo, 1997, p. 2).

For a citizen of international society, it is no longer enough to know how to read and write, or to have learned a skill. One must have access to information, know how to look for it and find it, master the usage, organize it, understand its organizational forms and, above all, make appropriate, adequate and effective use of it. "Even a global information society could become an ignorant society if it is unable to organize the information it receives, if it does not learn to decode the messages for appropriate education, if it is not accompanied by democracy and citizenship," says Bindé (1998).

On the eve of the third millenium, however, how many of us are actually capable of participating in, influencing and deciding on the destinies of the information society?

Cognition, interculturalism and computer literacy

Here it is crucial to observe the relationship between culture and learning in contemporary society. After all, the "real skills of daily life" discussed by Paiva, Fontanive and Klein (1998) and needed for survival in an interconnected society will arise from situations experienced by each person, in each community. Cognitive processes are always subordinate to the meanings attributed by individuals in each social and cultural context. There are subjects who display a skill in one context but not others, thus underlining Cole's thesis [27] that cognitive processes may be of a situational nature. Winograd and Flores (1986) say we must understand cognition not as a mental activity separate from reality, but as a behaviour pattern essential to the functioning of the person or organism in the world.

In fact many transcultural experiments on cognitive development have shown that cultural differences do not lie in a specifically intellectual capacity, but in differences in the valuing of learning experiences, depending on different contexts and situations. Carraher, Carraher and Schliemann (1982) did an experiment with semi-literate children living in the poorest areas of the Brazilian Northeast, to observe how they developed their numerical calculations. The researchers selected children from 9 to 15 years old who sold fruit along the beach or in the market. The first tests were conducted in the workplace. The researchers began by asking the price of a single product, and gradually moved into questions demanding that the children understand more and more complex mathematical operations. The results showed that the children's ability to calculate improved when dealing with concrete situations, such as those faced in their daily work selling fruit, and declined in more formal contexts, such as school. The authors concluded that failure in school is not a failing of the child but of the school itself: "failure in its inability to measure the child's real skills, in its ignorance of natural processes that lead a child to acquire knowledge and in its inability to relate the formal knowledge it hopes to transmit to the practical knowledge that the child, at least in part, already possesses" (p. 86).

Based on observation of the particularities and idiosyncrasies of each group, in each context, and considering the situational and cultural aspects of the problem of cognition, it may be possible to make a concrete attempt to understand and comprehend others, thus giving rise to integrated, reliable and radically new conceptions of intercultural communication for the Internet, as suggested by Bindé (1998).

Internet in Brazil: a towering wave

An article published on the NUA Internet Surveys site points to the rapid growth of free Internet services in Brazil, a move being financed by banks and automobile firms: "Apart from offering free Internet access to customers, Brazilian banks are also extending their financial services online and creating online shopping malls on their sites. There are few credit card holders in Brazil but recent developments allow Internet users to shop at these bank-malls by using money held in the bank to pay for purchases. Italian car manufacturer Fiat is giving free Internet access to the first 1,500 purchasers of one of its new models and a General Motors spokesman said the US giant may well follow suit. In a bid to stave off the unorthodox competition, ISPs in Brazil are also now offering free access. Industry executives estimate that 70 percent of Internet users there will have free access by the end of 2000. Average annual income in Brazil remains low and the cost of Internet access has hitherto been a serious barrier to growth in the B2C sector. B2B ecommerce is taking off in Brazil as open trade policies and increased foreign investment have created the right climate for Internet commerce" [28].

In October 1999 Brazil ranked third in South America in terms of number of telephones installed: 16 telephones for every 100 people. In less than two months, Brazil's telephone

companies installed 850,000 fixed lines and in 13 months the conventional telephony network had grown around 28% as 5.6 million new telephones were installed. It is speculated that telephony – as the mainspring for introduction of the Internet – will enable computer sales to spread among the poorer classes, thus boosting the practice of e-commerce in Brazil. E-business professionals are not about to overlook a country with 160 million inhabitants, of whom only a little over 5 million are connected to the Internet today. Already, intensive publicity campaigns in the press and on television are urging people to buy telephone lines and computers in order to use the Internet, while access providers jostle with ever more attractive offers. Brazil's extremely high potential for e-commerce is determined by certain national characteristics: widespread, installed television technology, along with extremely high national audience ratings, which makes it easy to instill consumer values and needs; an ingenuous, orderly, peaceful population with scant education and high rates of illiteracy, inclined to accept and repeat whatever television dictates and recommends, and to consider anything from abroad as better and more reliable than what is produced in Brazil. To judge by the volume of investment in publicity broadcast in Brazil to promote the Internet, by the soaring numbers of telephones being installed, and by the flocks of providers marshalling new users by offering Brazilians free or low-cost access, there will very shortly be an explosion of e-commerce in Brazil. There is talk of international investors' interest in incorporating the C and D groups into the Internet with a view to selling the – generally low unit cost – household appliances and other goods consumed by this bracket.

Note, however, that this promotion and popularization of Internet use, motivated chiefly by interest in the Brazilian e-commerce market, brings in its wake the opportunity for an ever larger contingent of Brazilians to make use of the Net's vast informational and communicational potential. But are we Brazilians – and this includes Net users in the C and D groups – prepared, in the short term, to make full and effective use of this technology? Are we in a position today to learn, to adapt and to meet the standards set by those who developed this technology in the First World? Will we – and the other communities of our planet – be able to perform the complex activities entailed by search machines, by research through access to the data banks of major universities and institutions, by visiting museum collections around the world, consulting international data and news, gathering, exchanging and distributing data, news, goods and feelings? Will we be able to benefit fully – just as some communities already do – from the existence of this wondrous technology?

In this context there can be no denying the importance of government capacity-building policies for efficient Internet access and utilization. In Brazil today, there is an almost total lack of measures with national scope in this regard, except for a few sporadic, discrete activities, which are generally small-scale and produce little in the way of effective results. In an interview in late 1999, Carlos Alberto Afonso, one of the pioneers responsible for the introduction and administration of the Internet in Brazil, touches on the subject: "In Brazil, there have been NO effective nationwide moves in this direction. None. On paper there are top-down proposals whose scope we have no way of assessing, because nothing has been done yet. (...) Everything that grows explosively in terms of well-being, comfort and services in this country benefits the middle class and up. (...) Look, even Peru has a significant policy for setting up multipurpose tele-centers (for access and training) overseen by the Peruvian Scientific Network – one of the most inclusive measures to extend universal access to the Net of its kind in the world. There are hundreds of tele-centers there, training young people in the interior of the country in information technology and Internet services. The community tele-center (at public schools, community centers, etc.) is an effective way of introducing appropriate local access solutions in societies where ideal (individual) universal access is not going to be possible even in two generations" [29].

In Third World countries – where access to telephone lines and personal computers is limited to the tiny upper classes – there is a need to find alternative solutions to permit Internet access to those in the less privileged classes. This was the point of departure for the Peruvian Scientific Network (*Rede Científica Peruana*, RCP) when it conceived and implemented its Public Booth Network: “The booths are community centers able to offer 60 different services, particularly for producing and circulating information, communication tools, entertainment, education and e-mail. The booths have 20 computers connected to an Internet server”. Speaking in December 1999 at the conference “Citizenship and the Internet”, the project’s coordinator, Jose Soriano, stressed that “this alternative model of access must be self-sustaining – it cannot be linked to the State or depend on the major communications corporations. In order to ensure this self-sustainability the booths had to be made commercially viable and generate income for the institutions involved”. A series of projects was also set up in connection with the booths to encourage dealings among the various regions of Peru, and to promote the exchange of commercial and cultural information. “Mothers in Cuzco trade the recipes for their homemade *empanadas* with mothers in other regions. Although this trade is sometimes done informally and on a very small scale, this is the right approach to *e-business* in the Third World” [30].

These initiatives in Peru have served as an example of how developing countries can – and must – encounter solutions tailored to their specific situations if they are to universalize Internet access and use.

“Unless we ensure proper capillary penetration and are creative in introducing alternative forms of universal access, we shall be dynamizing this ‘new society’ for the ‘already-haves’, helping perpetuate inequality and violating the essential right to communicate, and that in a context – right from the start of the next century – where having effective, low-cost access to the Net will be at least as essential as having access to a telephone line. While backbones in Brazil are still at the 2-megabits-per-second stage and only 3 in 100 people have access, in the developed world, these circuits are already being readied to transmit petabits per second (that is, a billion times faster) and at least 30 in 100 people already use the Internet” (Afonso, 1999).

It is not the technology in itself, but rather the policy for introducing, accessing and using it, how it is applied, the laws and the rules that legitimate it, the ethics by which it is to be governed, and the principles that sustain it, that must be reviewed and evaluated constantly so that it is used appropriately and efficiently, in accordance with the purposes of each context and each community.

As Caminha so rightly said in 1500, this people of Brazil “is good and of good simplicity”. Nonetheless – as the rapidly approaching wave of popularization of the Internet towers over us – it is urgent that policy strategies be traced to protect national interests, and that immediate, emergency investment be made in education to ensure not just superficial computer literacy (as occurs today in the few projects of this kind), but rather that the people of Brazil have the opportunity for active, aware participation in the information society. Otherwise, “whatever stamp one wish to give them will be quickly imprinted on them...” [31].

Now that we know the world is round, and that we can sail its oceans without fear of the abyss, we perhaps need to re-learn how to do just that, so that a New World can be not discovered or found, but built.

Social commitment and responsibility: electronic art for a real world

Wilson (1987) perhaps answers that question when he suggests that the prime function of artists and designers is to watch over the cultural frontier. For him, these professionals

have cultivated sensitivities and expression skills that allow them to anticipate and interpret cultural patterns, to reveal unrecognizable aspects of the contemporary world and so serve as guides to a more human future.

In a scenario pointing to the need for individuals to access, know and use the information now moving on the Internet – on a truly global scale – the designer plays a leading role as an intermediary between human beings, their culture and their technology.

At the *Núcleo de Arte Eletrônica* (NAE), an electronic arts laboratory set up in 1992 at the Arts Department of Rio de Janeiro Catholic University, we have embarked on a series of research studies and projects, most of which relate to social issues. Our projects deal with subjects like the WWW and illiteracy, ATM interfaces for users with different levels of schooling, and so on, and are financed and supported by public research funding agencies. At present, we are engaged in the project “Misery, Illiteracy, Internet and WWW: myths and challenges”, which involves setting up a site that will convey how citizens from various social strata in Rio de Janeiro State perceive and understand the Internet [32]. Our aim is to set up a site about the Internet. We are interested in finding out what ideas people have of the Internet, its main purposes, its structure, functioning, usefulness and future. We intend to show that “people” is a very broad category, especially when one lives in a state like Rio de Janeiro, which is quite well known for its dramatic social contrasts. The majority of those living in luxury homes and sophisticated apartments share the same public space, shop at the same supermarkets, travel on the same public transport and frequent the same beaches as people who live in unreliably built shacks, who have to climb the steep slopes of the shanty towns to reach their homes, who live without drinking water or sanitation in conditions of extreme – material and human – misery that are spreading further and further through all Brazilian towns.

We interviewed 120 people – both literate and illiterate, young and old, poor and rich – living in Rio de Janeiro: teachers, street sellers, web designers, fishermen, doormen, students, artists and children. We interviewed people who live in shanty towns and people in exclusive neighbourhoods, people from urban and rural areas, people who earn 100 or more minimum wages a month and others who would be happy to earn just one minimum wage (approximately US\$60), because they do not even make that much. We collected all these people’s impressions and declarations regarding the Internet, and we began to weave a network of identities as part of our site. The aim of the site is to show the diversity of the opinions documented, and the potential and prospects of the Internet boom in Rio de Janeiro – and how the haves and have-nots understand the connected society. Through the site we hope, in short, to present and discuss what we know as “net-socio-diversity”.

Netizens, net-fringers and outsiders

So, the site we are designing is about people – people who connect, who chat, people who e-mail, log in, plug-in, download, exchange and interact in real-time with other people through the Internet. People who are striving to be able to share common symbols and codes with people from different backgrounds, even if sometimes it implies surrendering some of their cultural traits. They are the “netizens”.

It is also a site about people who have heard of the Internet, who may understand its importance for their future, but who have no access to it. A few of them may have a chance to get close, perhaps to surf the Web over other people's shoulders. But they will never quite be able to understand the complex logic of the Net, nor to explore its full potential. They are not being prepared for this and, after all, the Net is not being designed for them. They can be called the “net-fringers”.

But this site is also about people who will never have access to the Web, people who do not know what the Internet is, people who are excluded from all possible benefits a networking society may offer. For the “outsiders”, the Internet makes no sense, and brings no hope.

This is a site built with passion and criticism, with patience, observation and respect; a site where every person counts.

No matter who.

Just the way we hope the Internet itself will be, one day.

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