Learning in a Global Society

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INTERNATIONAL DEVELOPMENT: THE BROAD CONTEXT

The development of distance education outside the places where it first took hold in Australia, Europe and North America was largely prompted, at least initially, by what is commonly referred to as 'international development.' The meaning and connotations associated with that concept have changed significantly over time. In fact, the history of international development is already some 60 years old, but the origin of its pre-history may be located hundreds of years earlier, when the efforts of navigators and new conceptualizations by scientists started changing dominant ideas about the world and perceptions of the place of humans within it (e.g. Boorstin, 1985; Koestler, 1959). Those who had the economic power and thus had access to the technology of the day, discovered that they were not alone in the world and that other peoples – mostly seen as essentially different and invariably inferior – co-inhabited the planet. Thus, different forms of often exploitative cohabitation emerged. Colonization was born. That period ended during the third quarter of the last century. Emancipation

and decolonization, largely driven by the formerly oppressed, led to the recognition among those who eventually relinquished power that not everything in the world was right. In fact, it laid bare great inequalities that conflicted with long held moral convictions – convictions that had, until then, been solely applied (and even then only partially) to the societies of those who held the convictions. Such inequalities, it was realized, were immoral and they threatened stability. A new world order was called for.

Initial ideas about development focused on technology transfer. The world was seen as polarized between developed and underdeveloped nations, terms that were later replaced by industrialized and developing nations. A simple rationale lay beneath the development philosophy. Those countries that saw themselves as developed had little to learn from those that required development; contrariwise, the developed nations felt obliged to share their expertise with those whose different state of development was assumed to have resulted from the absence of such expertise. There was thus a formidable urge on the part of some to teach and an assumed great need on the part of hundreds of millions of others to learn. While the development discourse reflecting this philosophy has become more nuanced over the decades, much of its basic assumptions are still very much alive.

The above remarks provide a backdrop for the subsequent discussion of the role of distance education as a contributing factor to attempts to build a better

world. The following four statements are offered as an advance organizer for that discussion:

1) The development effort undertaken over the past 60 years has, to a considerable extent, focused on creating and improving education systems, modeled after those of the industrialized West.

2) Educational needs in developing nations (defined as implied by the previous statement) have been so enormous – compared to the available resources – that traditional modalities to meet them could not be but insufficient. The search for alternatives, including distance education, was a natural consequence of this recognition.

3) The visions underlying the concepts of development and education tend to explain the world, its history, and the possibilities to shape its future, in linear terms. They furthermore assume that the knowledge systems of the developed world are superior to local or indigenous knowledge systems. The history of international development during the past 60 years justifies questioning the validity of these visions.

4) When the international development effort took off, the prevailing global issues and concerns were limited in scope and biased towards the problems that had upset the world during the late nineteen-thirties and early nineteen-forties. It took another half century to discover that the world was infinitely more complex than we had ever thought. A more

comprehensive picture of global issues and concerns has started to emerge during the last decade of the twentieth century and the start of the new millennium. However, we far from understand fully how to deal with the implications of those issues from a learning point of view.

SCOPE OF THIS CHAPTER

This chapter looks at distance education in the perspective of global issues and concerns, a topic closely linked to the very reasons why distance education became an important international development issue. I shall particularly focus on the discrepancy between the established practice of distance education and the overriding purposes for educational development. This will lead to a critique of the field as it currently stands, a critique, though, that is equally valid for many other modalities of educational practice.

The above referred critique of distance education is linked to the larger question of the meaning of learning. After an analysis of the development of distance education in the next two sections, I shall therefore elaborate on the need to revisit the meaning of learning as it relates to the demands of our time. This will then allow holding current perceptions of distance education against the light of an enhanced vision of learning, leading to recommendations about what to emphasize and what to de-emphasize in developing the field further.

TAKING A CLOSER LOOK AT THE PROBLEM

The development of distance education globally, particularly in the developing world, has largely been driven by the desire to overcome the shortcomings of established schooling practices. The literature of the period when distance education started to position itself as a serious alternative to or complement of school-based offerings would often contrast distance education – or, as it used to be called, correspondence education and, in some other cases, radio or TV education – with so-called traditional or conventional education (e.g., Edström, Erdos, & Prosser, 1970; Erdos, 1967; Faure et al., 1972; Perraton, 1976; Young, Perraton, Jenkins, & Dodds, 1980).

Different considerations motivated the emergence of distance education as a significant alternative. Chief among them was – and still is (e.g. Creed & Perraton, 2001) – the growing concern that a large proportion of the world's population remained deprived of opportunities to learn, while those same opportunities were commonly available to others.

At the same time there was the expectation that "new media" would usher in an era of until then unimagined possibilities to overcome the barriers of the past. In an address to the State Department on 20 August 1971, Arthur C. Clarke expressed it this way: "The emerging countries of what is called the Third World may need rockets and satellites much more desperately than the advanced nations

which built them. Swords into ploughshares is an obsolete metaphor; we can now turn missiles into blackboards" (Clarke, 1992, p.208).

Hope and vision were accompanied by the desire to gather evidence in support of the claims that media, and the instructional design principles underlying their use, could indeed help to overcome the formidable obstacles faced by educational leaders and planners in developing countries. Most notable perhaps was a worldwide research project undertaken by UNESCO's International Institute for Educational Planning in 1965 and 1966 under the leadership of Wilbur Schramm, resulting in the landmark publication of three volumes on *New Media in Action: Case Studies for Planners* and a companion volume on *The New Media: Memo to Educational Planners* (UNESCO: International Institute for Educational Planning, 1967a; 1967b). Other prominent sources reflecting the thinking of that time regarding the educational use of media are Schramm's (1977) *Big Media, Little Media*, Jamison & McAnany's (1978) *Radio for Education and Development*, and Jamison, Klees, & Wells's (1978) *The Costs of Educational Media: Guidelines for Planning and Evaluation*.

During the same period the instructional design field was coming of age with such classics as Gagné's *The Conditions of Learning* (first published in 1965) and Gagné and Briggs's *Principles of Instructional Design* (first published in 1974), giving confidence that the process of making people learn, and ensuring that their learning achievements would match their originally identified learning

needs, could not only be controlled but also managed within a considerably wider range of parameters than those traditionally considered. Particularly, it became clear that such a process was not necessarily or exclusively dependent on the physical presence of a human facilitator.

The above factors taken together provided a powerful reason to search for the solution of the world's educational problems in settings beyond those of the conventional schooling practice. Naturally, it also raised questions about the quality of the contemplated alternatives as compared to the traditional practices they were supposed to replace or complement.

Two inadequacies of traditional education are usually highlighted in such sources as mentioned above. Then as well as now, traditional schooling systems cater for only a limited part of the audience they are supposed to serve. This results in great inequity globally regarding people's chances to become active participants in a world that is larger than their immediate environment. It led Julian Huxley, Executive Secretary of the Preparatory Commission for UNESCO in 1946, later UNESCO's first Director-General, to consider that "Where half the people of the world are denied the elementary freedom which consists in the ability to read and write, there lacks something of the basic unity and basic justice which the United Nations are pledged together to further" (cited in UNESCO, 2000, p. 27). While Huxley recognized that various factors are responsible for such inequity, he saw what was then called "Fundamental Education" (p. 27) as

essential to "the wider and fuller human understanding to which UNESCO is dedicated" (p. 27). The problem is far from over. According to current UNESCO statistics, nearly one in seven people in the world cannot read or write (Sharma, 2003). Moreover, a just released report by the UNESCO Institute of Statistics (2006), combining the statistical data gathering and analysis techniques of UNESCO and UNICEF, puts the number of children in the primary-school-age not going to school at 115 million, i.e. almost one in five of this age group worldwide. Both illiteracy and school exclusion affect females more than males.

However, access to learning opportunities was, and is, not the only problem. The other major shortcoming of the schooling system, recognized in at least part of the literature cited earlier (e.g., Faure et al., 1972; Young, Perraton, Jenkins, & Dodds, 1980), had and has to do with the schooling tradition itself, particularly the kind of learning it instills in students, the social consequences of expectations it generates, and the often poor relevance of what is being taught for those who learn and their surrounding development context.

The former of the two deficits constitutes a violation of the fundamental human right to education. That right is specified in Article 26 of the Universal Declaration of Human Rights. The World Education Report 2000 (UNESCO, 2000) gives ample coverage of how that right and its implications have been perceived and discussed since the Declaration was adopted and proclaimed by the General Assembly of the United Nations on December 10, 1948. The continuation

of that debate and associated discourse is reflected in the current declared commitment by the international community to the Millennium Development Goals (MDG), adopted by the UN General Assembly in September 2000 (United Nations, 2005). While there are obvious advantages associated with benchmarking the kind of change intended by the MDG, making their degree of implementation measurable, some analysts, such as Amin (2006), argue that setting and adopting goals such as the MDG without engaging in deeper reflection on the causes of what is wrong and what must thus be done to make the world more just is an exercise in legitimizing the status quo of the dominant economic and political interests.

It is important for our discussion that the Universal Declaration of Human Rights links education to "the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms" (cited in UNESCO, 2000, p. 16). Education, in the view of the Declaration, thus transcends the mere concern with the acquisition of particular skills and pieces of knowledge. Instead, it relates it to the ability to live in harmony with oneself, one's environment and one's fellow human beings.

Article 26

1) Everyone has a right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit.
2) Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace.
3) Parents have a prior right to choose the kind of education that shall be given to their children.

From: Universal Declaration of Human Rights (1948; cited in UNESCO, 2000)

Consequently, the deficit of the school system should not be interpreted solely in terms of the lack of opportunity to acquire such competencies as the ability to read and write, but rather in terms of how such, and other, abilities "promote understanding, tolerance and friendship among all nations, racial and religious groups,...and the maintenance of peace" (p. 16).

Insofar as distance education strives to overcome the shortcomings of the school systems, it should be judged by the above standards. The primary question to be asked is not how the development of distance education has improved access to and participation in education, and at what cost, but rather: Does distance education contribute to a better world? Put this way, the question also includes concerns about the second major area identified above, the one that motivated the distance education field to see itself as an opportunity, not only to open up possibilities for learning to the as-yet unreached, but equally to do so in ways that would be responsive to questions about the purposes of education, the meaning of learning, and the critique of the existing schooling tradition.

MEANS OR END?

Article 26 of the Universal Declaration of Human Rights represents a rare instance in the development of international discourse about educational policy where an unequivocal reference is made to the purposes of education beyond the scope of particular content concerns. It advances the perspective that education is

not an end in itself, but rather a means towards how we, humans, collectively shape the ways in which we socially organize ourselves, live together, and share the resources of our planet. The terms in which that perspective is formulated reflect the post-World War II concerns of the time when the Declaration was drafted. The ensuing debate and subsequent international frameworks developed over the past half century have consolidated, strengthened and expanded the original vision of Article 26, allowing it to evolve and become responsive to currently felt global concerns. Sustainable development and poverty eradication are but two of the global concerns that were not explicitly expressed in the original formulation of Article 26, which are now felt to be essential for a stable and harmonious world order.

Particularly the last decade of the past century has seen heightened interest in discussing the purposes of education in the light of global issues and concerns. Those issues and concerns have to do with such matters as our fragile environment; the growth of the world population; our ability to interfere technologically and scientifically with who we are; the depletion of the world's resources; the advancement of peace, not as the mere absence of war, but as a culture, a set of values, attitudes, traditions, modes of behavior and ways of life (United Nations, 1999); and the impact of pandemic diseases. An impressive range of world conferences – the World Education Report 2000 (UNESCO, 2000) mentions 15 of them, starting with the World Conference on Education for All in

Jomtien, Thailand in 1990 and ending with the World Science Conference in Budapest, Hungary in 1999 – has helped to put the crucial issues of our time on the agenda of the international community, while seeking to understand how education can contribute to addressing them. Two major UNESCO reports produced during the 1990s – *Education: The Treasure Within* (Delors et al., 1996) and *Our Creative Diversity* (Pérez de Cuéllar et al., 1996) – should be seen in the same light.

This renewed attention to the overriding purposes of education should come as no surprise. For the first time in several million years of hominid development, the human species faces challenges of a magnitude it has never had to deal with before. I have argued elsewhere (J. Visser, 2001), drawing also on the views of authors such as Koestler (1989/1967), Pais (1997), and Sakaiya (1991), how these challenges are part of a context of change patterns that are unique for our time and markedly different from those that characterized the human condition a mere couple of decades ago. They require human beings to be able to function in entirely unpredictable situations. Lederman (1999, April) thus calls for schools to

> look across all disciplines, across the knowledge base of the sciences, across the wisdom of the humanities, the verities and explorations of the arts, for the ingredients that will enable our students to continually interact

with a world in change, with the imminence of changes bringing essentially unforeseeable consequences.

It needs no arguing that, by extension, the same rationale should apply to any alternative to the school, such as distance education systems that are being put into place to overcome the shortcomings of the school. However, it would be a mistake to look at the school, and its alternatives, as a panacea for the complex set of problems referred to above or to look at it in isolation. Schooling is not the same as learning. Schooling plays a role, and it can play a much more useful and effective role if it were profoundly reconceptualized, but that role is limited and relative to the role played by other factors that condition the learning environment at large. To appreciate the relative importance of the schooling tradition – including how that tradition is reflected in the practice of distance education – as well as to critically do away with those elements of the tradition that violate the attainment of agreed purposes, we must first develop a more comprehensive picture of what learning is.

LEARNING: THE COMPREHENSIVE PICTURE

One of the greatest impediments to the development of a learning society is the difficulty to overcome the preconceptions about learning with which we grow up (J. Visser & Y. L. Visser, 2000, October). The need to broaden our views of learning has been amply discussed in a series of transdisciplinary debates,

promoted and conducted under the auspices of UNESCO and the Learning Development Institute since 1999 (J. Visser et al., 1999; Meaning of Learning [MOL] project, n.d.).

Further insight can be derived through disciplined inquiry into learning as perceived by those who learn. Such inquiry typically focuses on the entire human being or on the activity of an entire collaborative entity in a cultural-historical perspective. It thus involves units of analysis whose order of magnitude by far transcends the habitual research perspective, which tends to focus on learning tasks that are narrowly defined in scope and time and that may involve only very specific learning behaviors assumed to be undertaken by isolated individuals. (A similar point is made by Cole, 1991, regarding the need to redefine the unit of analysis in the study of socially shared cognitions). Research such as referred to above was reported by Y. L. Visser and J. Visser (2000), by J. Visser, Y. L. Visser, Amirault, Genge and Miller (2002, April), and by M. Visser and J. Visser (2003, October) in their analysis of so-called learning stories. That research focused on the perceptions about learning from the perspective of individuals. John-Steiner (2000) went beyond the individual level, making the collaborative team or partnership the unit of analysis, in her study of creative collaboration.

The results reported by Y. L. Visser and J. Visser (2000); Visser, J., Visser, Y. L., Amirault, R. J., Genge, C. D., & Miller, V. (2002, April); and M.

Visser and J. Visser (2003, October) indicate that the advance towards meaningful learning should focus on:

- the development of felt ownership of knowledge;

- the emotional integration of any particular learning experience in an individual's perceived lifespan development;

- the generative nature of learning;

- the real-life context as the natural habitat for learning;

- the interaction with the learning of others as a basis for one's own learning;

- the power of learning to turn negative self-perceptions into positive ones;

- the discovery of persistence as a strategy to manage life's challenges.

Such learning was found to be particularly facilitated when initially negative conditions could be transformed into positive challenges; when role models were present or emotionally significant support was available in the environment of the learner; or when there were opportunities for independent exploration of one's learning and metacognition.

Much in the analysis of the above-referred individual learning stories points towards the importance of context, particularly the social, cultural and historical integration of the learning individual. John-Steiner's (2000) analysis of cases of creative collaboration reinforces, makes more explicit, and enhances that notion. In analyzing her cases, she builds a strong argument against the prevalent

cultural model of the solitary creative mind and stresses the principle that "*humans come into being and mature in relation to others*" (p. 187). Interdependence, or social connectedness, is thus a crucial dimension of any learning context, a dimension that needs to be balanced with that of the learner's individuality.

Feldman (2000), shedding foresight on the importance of John-Steiner's work, refers to the search for "balance between individuality and social connectedness" (p. xii) as the central theme of the current century, contrasting it with the past century's focus on "intellectual development that placed the lone seeker of knowledge…at the center of the developmental process" (p. ix). Such a shift of focus comes at a good time. The global issues and concerns considered in this chapter are too involved and too complex to be addressed by solo efforts. They call for visions of learning that are built around notions of sustained collaboration and dynamically evolving dialectic relationships between individuals and communities. Such visions have only marginally to do with the content of learning. Rather, they impact on how people learn and therefore on how the learning landscape should be restructured. They are an equally powerful motivation to start thinking differently about learning, "undefining" the concept (J. Visser, 2001), and recasting it as a disposition to dialogue – expressed at different levels of complex organization – for constructive interaction with change.

A final important contribution to creating comprehensive visions of learning can be found in the efforts to review significant research findings of the past and present, emanating from different disciplines, with a view to summarizing them in the framework of transdisciplinary major themes. An excellent example of such an effort is the work undertaken by the Committee on Developments in the Science of Learning of the National Research Council (Bransford, Brown, & Cocking, 2000). The Committee identifies five major themes that are important in changing our conceptions of learning. They have to do with: (1) how we develop coherent and accessible structures of information; (2) the ways in which we develop expertise and acquire the capability to solve problems we have never dealt with before; (3) new insights in learning and mental development at the initial stages of the human lifespan; (4) the role played by metacognitive and self-regulatory processes; and (5) the relation between learning and the cultural and community context in which symbolic thinking emerges.

ACHIEVEMENTS TO DATE

Earlier in this chapter I referred to Article 26 of the Universal Declaration of Human Rights as an instance of broad consensus within the international community about the crucial importance of a global concern and the potential role of education – and thus also distance education – in addressing it. Considering that many more such global concerns have lately been added to the shared

conscience of humanity, it is of interest to look back and ask ourselves what has been done. What we see is not encouraging.

There is little doubt that considerable achievements in implementing Article 26 mark the more than five decades since the proclamation of the Universal Declaration of Human Rights. The field of distance education can claim credit for at least part of those achievements. However, as the World Education Report 2000 (UNESCO, 2000) points out, surprisingly little of what was achieved reflects a concern with more than increasing the numbers of those who benefit from structured learning opportunities. In the words of the report:

> While . . . there has been a great deal of progress worldwide over the past half century towards implementation of the right to education in terms of access to education, it nevertheless remains that the vision that came to be embodied in Article 26 of the Universal Declaration of Human Rights was not just a quantitative one. It was also a qualitative one concerning the purposes and hence contents of education. (p. 74)

The language of the above quote is confusing as it equates "purpose" and "content." It is important to distinguish between the two concepts. The concept "content" connotes subject-matter knowledge. This may easily be interpreted as a commodity traded between those who possess it, the teachers, and those who wish to acquire it, the students. Content, however, is only one element that may or may

not contribute to attaining a particular educational purpose. The following example may elucidate this.

It is sometimes thought that the teaching of subjects such as history and geography can have a potentially important impact on how students will think about and treat their fellow human beings pertaining to other cultures or whose existence is marked by different histories. Such a thought may indeed have motivated the 1949 International Conference on Public Education, which, mindful of the words of the Universal Declaration, recommended "the teaching of geography as a means of developing international understanding" (cited in UNESCO, 2000, p. 77). While I shall be critical, in what follows, of the rather naïve assumptions inherent in this recommendation, it should be noted that this was one of only two International Conferences, held during the twenty years following the adoption of the Universal Declaration of Human Rights, that produced anything reminiscent of the global issues raised in the Declaration.

It is unlikely that the simple introduction of a piece of curriculum, or the restructuring of existing curriculum, in accordance with the above idea, will more than marginally contribute to the earlier-mentioned larger goal of international understanding so long as "teaching" means "transmission of pieces of knowledge." Much more is needed in changing attitudes. Both Bandura (1969) and Gagné (1985) argue that human modeling and practicing of the model are essential. In the case of our example, the content of disciplines like Geography

and History may be about as relevant to being exposed to models of human behavior, and being encouraged to practice them, as is the content of disciplines such as Physics, Chemistry, Biology or Mathematics.

In fact, as a segment of the traditional school curriculum, the latter set of disciplines may be more adequate, if purposefully taught, in a strategy to contribute to international understanding. Practitioners of the natural sciences and mathematics are known for their disregard of conventions that would limit them in their pursuit of the advancement of knowledge in their field. This is exemplified by how, during the coldest periods of the cold war, there has always been scientific exchange across the so-called "iron curtain." Moreover, even as the Nazis rose to power in Europe, and the Second World War ravaged the continent and its scientific community, interests within the latter ensured that after the end of the war, wounds could quickly be healed. Numerous accounts of the lives of scientists and the development of science in the twentieth century (see, for instance, Pais, 1991 and Perutz, 1998) describe in detail, and with great attention to the human qualities involved, what was at stake.

The above argument shows that appropriate procedures, involving apparently unrelated content, can very well serve the purpose of developing tolerance and international understanding. The proper teaching of science could bring to life the human models that Gagné (1985) and Bandura (1969) call for. Practicing those models can well be undertaken in the context of collaborative

projects across geopolitical and other boundaries among students (sometimes also involving practicing professional scientists) in areas like environmental science. Current technologies facilitate the building of such distributed learning communities.

CHALLENGES AHEAD

The prevailing focus in the rhetoric of distance education has for a long time been on such issues as cost-effectiveness, economies of scale, and parity of esteem, all of them defined with reference to the traditional school context. This has left the thinking about distance education in the fold of the dominant classroom model. Despite the advent of powerful new technologies and the increasing realization that the problems of today are essentially different from yesterday's problems, there is a disturbing lack of imagination in how discourse and practice remain locked up in the conceptions of the past. The abundant use of such terms as "online classroom" and "virtual school" is but one expression of how powerful a place the ideas of school and classroom continue to occupy in our language, and thus our thought processes. Even when new terms are introduced, such as e-learning, the reality behind them is often as sadly representative of the unaltered past – cast for the occasion in new molds – as the choice of the term itself is testimony to the absence of creative thinking.

Simonson (1999) calls for strategies that provide "different but equivalent learning experiences" (p. 29) to learners in face-to-face classes and in online classrooms. This so-called equivalency theory, while recognizing the differences in instructional contexts between the two modalities concerned, may do little to promote a fundamental rethinking of what goes on inside the learning space, whether virtual or real, the implicit assumption being that the face-to-face classroom is the norm and that equivalency rather than improvement should be sought.

Contrasting with the above is the sense of critical appreciation of the state of distance education in the world, emanated from a group of 23 experts from around the globe, convened by UNESCO, at a meeting in Karlsruhe, Germany. One of the recommendations made by that group states:

> Now that distance education has reached its desired level of recognition and esteem *vis-à-vis* traditional educational alternatives, time has come for it to take a critical look at itself, asking questions about how existing experience fits in with the requirements of and opportunities inherent in present day society and how it reflects the current state of knowledge about how people learn. It is recommended that such a critical attitude drive any future development in the field of distance education in UNESCO and its Member States. (UNESCO, 2001, February, p. 4)

The group framed its recommendation with particular reference to "the evolving notions of a learning society and of lifespan human development" (p. 4). It furthermore recommended that distance education be seen as "just one modality – or set of modalities – among many others that together shape the learning environment, which is multi-modal and aware of multiple dimensions of human intelligence, at the cognitive, meta-cognitive and affective level" (p. 4).

In connection with the above recommendation, the group of international experts convened by UNESCO devoted particular attention to the opportunities inherent in the currently available technologies. Market forces, rather than considerations about how and why people learn, determine that such technologies will be used. In the absence of clear thinking, their use will likely result in the replication of past practices by new means. At best, this means that nothing changes; at worst it means that with accelerated speed, and more forcefully than ever, bad practices will be consolidated and reinforced. Or, in the words of the report (UNESCO, 2001, February):

> The advent of the Internet and the invention of the World Wide Web have, supplemented by a wide and growing range of multimedia technologies, particularly during the past decade, fundamentally changed the equation of what is and what is not possible. It has particularly created opportunities for the rediscovery of learning as a dialogic and social process through which diverse people join in the creation of dynamic learning

communities, collaborating with each other while using their full human potential to continually develop their capacity to stand prepared for an ever-changing world. Such a process is one of shared construction, which, while it may contain linear elements, is greatly enhanced if the learning environment allows building blocks – of different granularity – to be brought in flexibly, as they are needed. The possibility to create, store and subsequently retrieve for use or further processing such building blocks in digital format is an important asset of today's technology. It awaits further exploration, particularly in the context of the [earlier referred] much needed reconceptualization of learning. In this process, the traditional roles of those who learn and those who facilitate other people's learning are bound to change so fundamentally that terms like "student" and "teacher" become less appropriate to designate the actors in the learning environment. The human and social processes that can be created, while using these new technologies to attend in massive ways to the innate human need to learn, can and must take full account of research findings that have redefined learning as a process of participatory construction rather than as individual acquisition (pp. 5-6).

The group thus recommended the inclusion of experts in communication and information technology in collaborative multidisciplinary partnerships involved in the reconceptualization of learning. Without doing so, it argued,

there is the great risk that the use of improved technology will only reinforce and consolidate practices that, though unfortunately often part and parcel of established educational practice, have long been recognized to be counter to the development of humanity's critical and creative capacity and of the human ability to confront the complex problems of today's world (p. 6).

The latter observation resonates with Salomon's (2000, June) criticism of "technocentrism," which "totally ignores some crucial social and human factors" (p. 4). He observes that without taking these factors into account, "virtual distance learning . . . is in danger of yielding virtual results" (p. 4). Salomon thus urges an emphasis on two things: *tutelage* and *community of learners*. The former aspect has received attention in L. Visser's (1998) work on affective communication (see also L. Visser, Plomp, Amirault, & Kuiper, 2002) and in Gunawardena's (1995) work on social presence. The latter aspect has been emphasized by the group of people who gathered initially around the ideas promoted by UNESCO's Learning Without Frontiers (2000) program and who later converged around the vision of the Learning Development Institute (2001). It inspires particularly the dialogue originated by the Learning Development Institute (2005) concerning the roles of and expectations about learners in a changing learning landscape.

COMPLEX COGNITION FOR A COMPLEX WORLD

Gell-Mann (1994) refers to learning as a process in which complex adaptive systems, such as human beings, interact with other complex adaptive systems, making sense of regularities among randomness and allowing them to mutually adapt. In a similar vein, the report of the Committee on Developments in the Science of Learning (Bransford, Brown, & Cocking, 2000) affirms that "learning is a basic, adaptive function of humans" (p. xi). To understand that function, and thus the practice of its facilitation, account must be taken of the entire developing transdisciplinary knowledge base that has its roots in such widely diverse disciplines as "cognitive development, cognitive science, developmental psychology, neuroscience, anthropology, social psychology, sociology, cross-cultural research, research on learning in subject areas such as science, mathematics, history, and research on effective teaching, pedagogy, and the design of learning environments" (p. xxi). Broadening our conception of learning is an essential prerequisite if learning is to have relevant meanings in the context of adaptive human behavior regarding the global issues discussed in this chapter.

Learning, then, should be understood to mean more than what is implied by its regular reference to particular desired changes in human performance capability. In a broader sense, which includes the more specific meaning just mentioned, learning can be seen in relation to the unending dialogue of human beings with themselves, with their fellow human beings, and with their

environment at large, allowing them to participate constructively in processes of ongoing change. In other words, learning must be "undefined." A possible redefinition thus calls for human learning to be seen as "the disposition of human beings, and of the social entities to which they pertain, to engage in continuous dialogue with the human, social, biological and physical environment, so as to generate intelligent behavior to interact constructively with change" (J. Visser, 2001).

Few people would doubt that learning impacts on the human brain. However, that recognition should not be taken to mean that the individual human mind in isolation should be the prime focus of attention for educators, whether at a distance or in the face-to-face mode. Quite to the contrary, it is increasingly recognized – for instance, by the collective of researchers that contributed to Salomon's (1993) explorations into the distributed nature of cognitions – that knowledge is socially constructed as a result of purposeful interaction among individuals in the pursuit of shared objectives that are situated in sociocultural and historical contexts. Views such as those referred to above should perhaps not be seen as new or surprising, as Nickerson (1993) points out. Rather, they are a consequence of the ways in which, for a very long time, formal instructional practice has kept its eye trained on the individual. So strongly has that been the case that the reality of the communities to which those same individuals belong could no longer be seen. What used to be obvious thus became forgotten and now

stands to be brought to the forefront again. Nickerson refers in this connection to Ulam (1991), who says: "Sometimes obvious things have to be repeated over and over before they are realized" (p. 303). In this particular case, however, more is necessary than the frequent repetition of the obvious; the obvious must first be resuscitated.

To do so, we must develop a vision of learning that is ubiquitous; unrelated to conditions such as age, time, space and circumstance of learning individuals; manifests itself not only in the behavior of individuals but at diverse levels of complex organization; and that, in whatever context it takes place, does so as part of a pattern of interrelated learning events occurring in what can best be called a "learning landscape." Cognition is, and has always been, an ecological phenomenon. Being an ecological phenomenon, it is also evolutionary. The two notions are interrelated, as Levin (1999) points out. "Ecological interactions take place within an evolutionary context and in turn shape the ongoing evolutionary process" (p. 46).

Invoking terms such as "ecology" and "evolution" is not an exercise in inventing sophisticated metaphors. Webster's Third New International Dictionary (Gove, 1993) defines ecology as a "branch of science concerned with the *interrelationship* of organisms and their environments, esp. as manifested by natural cycles and rhythms, *community development* and structure, interaction between different kinds of organisms, geographic distribution and population

alterations" (my emphasis). The origin of the word is, according to the Encyclopaedia Britannica (1999), the Greek "*oikos*," which means "household, home, or place to live." These descriptions apply as much to the world of learning entities as they apply to the world of living organisms. This should come as no surprise. The capability to make sense of regularity among randomness, which, according to Gell-Mann (1994), is the essence of learning, is also key to any life form's chances of survival in an environment populated with other forms of life.

My use of the term "learning landscape" may be taken to be metaphorical. Like the real landscape, the learning landscape is the result of, on the one hand, the natural – that is ecological – interplay of different learning entities seeking to establish themselves in the midst of others and, on the other, of the consciously planned action on the part of some actors to reshape and adjust what nature tends to produce. I use the term "landscape" deliberately because of its connotations, some of which are more poetic than operational. This, then, brings into play, in addition to the usual parameters of effectiveness and efficiency of the learning environment, also its aesthetic and ethical qualities. The planners and leaders whose actions impact on the learning landscape may well want to consider this extended meaning of the metaphor and look for beauty and harmony in the learning landscape as a major indicator for the quality of the ecology of cognition. It is probably no exaggeration to say that, so far, the work of governmental educational planning agencies, as well as of related entrepreneurial and

institutional efforts, to create the infrastructural conditions for the facilitation of learning, leaves considerable room for improvement in terms of the need to be environmentally aware of what else happens in the learning landscape. This observation obviously includes much of the distance education effort as well.

The term "learning landscape" reflects the idea of "complex cognition," a concept recently proposed by the author at a Santa Fe Institute seminar (J. Visser, 2000, November). Cognition is a complex phenomenon in the sense that it evolves according to the laws that govern the behavior of complex adaptive systems. The conditions that underlie such behavior are well known (see, e.g., Gell-Mann, 1995; Holland, 1995). The stock market, the weather, and biological systems are examples of it.

The notion of distributed cognitions approximates the idea of "complex cognition." However, as Salomon (1993) points out, the meaning attributed to the term "distributed cognitions" varies considerably, depending on the theoretical perspective adopted by different researchers. On one end of the spectrum there is the view that "cognition *in general* should be...conceived as principally distributed," the "proper unit of psychological analysis...[being] the *joint...socially mediated action* in a cultural context" (p. xv). This view contrasts with the common perception that cognitions reside inside individuals' heads. On the other end of the spectrum one finds the conception that "'solo' and distributed cognitions are still distinguished from each other and are taken to be in an

interdependent dynamic interaction" (p. xvi). This juxtaposition of views is resolved in the concept of complex cognition, which makes the distinction irrelevant, integrating the diverse points of view in a single notion. Cognition is individually owned *and* socially shared at the same time.

DISTANCE EDUCATION IN THE PERSPECTIVE OF GLOBAL ISSUES AND CONCERNS

I have so far deliberately refrained from focusing on distance education per se. The problem area chosen as a guiding framework for the intellectual pursuits I made reference to, that of the interaction between humanity's capability to deal with global concerns and the development of its capacity to learn, calls for a comprehensive approach that must not be restricted to the field of distance education alone. On the other hand, the question whether distance education may play a crucial role *within* such a comprehensive approach is a relevant one. I shall explore that question in this final section. While addressing it, I shall particularly look at what kind of questions need to be asked and what different orientations need to be developed *if* distance education is to play a crucial role.

One of the overall conclusions of this chapter is that the phenomenon of learning is infinitely more involved and complex than assumed in most of our actions to create the conditions that promote and facilitate learning. The earlier referred learning stories research (Y. L. Visser & J. Visser, 2000; J. Visser, Y. L.

Visser, Amirault, Genge, & Miller, 2002, April; M. Visser & J. Visser, 2003, October) suggests that significant learning often takes place rather *despite* than *because* of the conditions we created for it. I contend that this doesn't have to be so — that, in fact, we can be cleverer than we seem to be. To employ such enhanced intelligence, our approaches must become bolder and our views more comprehensive.

The global issues and concerns referred to in this chapter – the profound questions about how we live together on our tiny planet and share its resources, sustaining life as we came to know it and became conscious of our place in it, playing our role in, how in time, perhaps, a next phase in its evolution may emerge – find no response in our designed learning systems. Yet, most people share these concerns and feel they can no longer be dismissed or simply be seen as an afterthought of our more specific attempts at developing human capacity. The history of how the educational establishment, including the distance education variety of it, has failed to address such most-crucial challenges as the ones inherent in Article 26 of the Universal Declaration of Human Rights is proof of the fruitlessness of attempts to use our traditional learning systems in an isolated fashion while dealing with global issues and concerns. Such attempts must be undertaken, as urged in the earlier quoted UNESCO report, in a wider framework, namely that of the learning society and of lifespan human

development, taking full account of the convoluted ways in which humans learn (UNESCO, 2001, February).

The important question then is: How can distance education contribute to improving the ecological coherence of the learning environment so that it will allow meaningful learning to evolve in response to the crucial global issues and concerns that mark the beginning of the third millennium? The question branches off in a variety of directions, some of which will be highlighted below. To bring some order in the observations and conclusions that follow, I shall deal with them, respectively, at the levels of society at large; collaboration among institutions and organizations within society; the organization of specific institutions; and the learning process.

Implications at the Societal Level

At the level of society at large, the responsibility for the creation of the conditions of learning is a distributed one. This view contrasts with the common idea that such a responsibility resides solely or mostly with ministries or departments of education. Obviously, the latter idea comes from the misconception that education and learning are one and the same thing. It is important to make a distinction between the two and to look at the instructional landscape as a sub-landscape of the learning landscape.

Instruction is – or should be – a designed way to facilitate learning for specifically defined purposes. The preoccupation with instruction results in a wide variety of instructional opportunities. Within the conception, advocated in this chapter, that society at large is responsible for the totality of learning that goes on within it, the various instructional opportunities should be aware of each other and interconnect with each other. They form, as an organically interlinked whole of designed opportunities to learn, the instructional landscape.

The instructional landscape does not stand on its own. Many other sub-landscapes together make up the learning landscape, in a way similar to how Appadurai (1990) describes the dynamics of global diversity in terms of different "scapes." Other sub-landscapes included in the learning landscape are, for instance, the media landscape (see Allen, Otto, & Hoffman, 2004) and the socio-cultural organization landscape, of which the family is part. A truly ecologically functioning learning landscape will be characterized by the smooth integration among all the various sub-landscapes – together with their subordinated sub-landscapes – that compose the learning landscape.

Because of its potential flexibility and openness, the distance education modality can play an important role in bringing about ecological integration within the learning landscape. Doing so would be a more laudable goal – and a truly more exciting challenge – than the current emphasis on replication, for ever expanding markets, of outdated learning structures by new means.

Implications at the Level of Interinstitutional Collaboration

While in some parts of the world there may seem to be no limit to the resources that can be brought to bear on addressing the problems of human learning, whosoever takes the trouble to look at the world at large will soon discover that there is an important challenge in creating sustainable solutions that benefit large numbers of people. Sustainability in this context means that the cost of what we do at a particular time will not be charged to a future we are unable or unwilling to visualize or take responsibility for. It should also be noted that solutions that benefit many people do not necessarily have to rely on mass-produced and mass-delivered options.

There is enormous potential for promoting and facilitating learning in the networking of those who have a passion to learn (e.g. Rossman, 1993; Rossman, 2002). This applies to both individuals and institutions. Anything that detracts from the likelihood that interinstitutional collaboration would occur, such as the artificial opposition between learning at a distance and in the face-to-face mode, is thus counter to exploring this potential.

The tendencies of some institutional environments towards expansion (e.g. Daniel, 2000, July), sometimes through the merger with smaller entities, may seem to contribute to creating larger networks. However, there is the risk that the strong presence of large conglomerates reduces the diversity of the learning

landscape, thus taking away one of the most powerful resources in the learning habitat. To the extent that the learning landscape functions in ecologically sound ways, in other words, to the extent that diverse sub-landscapes are the active ingredients of the learning landscape, such homogenizing forces may be counteracted by heterogeneous dialogues resulting from interaction with different ideological and cultural traditions (Appadurai, 1990).

There may, as yet, not be enough evidence to draw definite conclusions about how the various tendencies towards globalization will affect diversity. It would be prudent, though, to keep an open eye towards what may be happening and to assess such possible impact on an ongoing basis. It is equally prudent to encourage ways of networking that deliberately thrive on diversity, i.e. multi-nodal collaboration among institutions that have a distinct identity, as opposed to building networks that are run out of a central node (e.g. Semenov, 2005).

Against the backdrop of the above cautionary remarks, I posit that increased networking around the globe is an important condition for the formation of dynamic learning communities that are sufficiently global in outlook to become a basis for learning to live together (Delors et al., 1996) with the global concerns of our time. For this to be possible, collaborating institutions must once again become what they used to be: universities, places of inquiry not limited by the boundaries of bureaucracy and traditional divisions among disciplines.

UNESCO's UNITWIN/UNESCO Chairs (n.d.) program is an interesting example in the above regard.

Implications at the Institutional/Organizational Level

The closing observation in the previous paragraph is also the first recommendation under the present heading. The model of monolithic, bureaucratized and compartmentalized institutions dominates the institutional heritage of the nineteenth and twentieth centuries. Such institutions now find themselves in need of becoming players in a networked environment, often having great difficulty to respond adequately to the challenge.

In using the term "universities" above, I do not intend to restrict my considerations to higher education institutions. The connection between higher education and higher learning—i.e., learning at a higher level of metacognitive awareness and capability—is rather weak, whence the meaning of the adjective "higher" in higher education seems to have little relevance as a qualifying concept for the kind of learning that is promoted by higher education institutions.

To play an effective role in shaping the increasingly networked learning landscape of the twenty-first century, institutions whose mission is to promote and facilitate learning must enhance their ability to interact constructively with their changing environment. In terms of the redefinition of learning called for in this chapter (see also J. Visser, 2001), this means that such institutions must conceive

of themselves as learning organizations. The literature in this area is vast and so well known that there is hardly a need to mention such names as Senge (1990); Argyris (1993); Senge, Kleiner, Roberts, Ross and Smith (1994); Marquardt (1996); or Hesselbein, Goldsmith and Beckhard, (1997).

The change of attitude implied in becoming a learning organization should go hand in hand with the development of systemic awareness and abilities in the institution, both in terms of its internal processes and with regard to its role vis-à-vis other institutions and the learning landscape at large. It must equally focus on the profoundly human (as contrasted with bureaucratic) mission inherent in fostering learning, a particularly acute challenge for institutions whose traditions are rooted in the philosophy of the industrial era (Peters, 1994). Clearly, this is a change that affects everyone in the institution: students, faculty, administrative staff, as well as management.

Implications at the Learning Process Level

The most important implications are at the level of the learning process. Very little impact on our ability to deal with global issues and concerns is likely to result from our continued preoccupation with knowledge as a thing, as opposed to knowledge as a process. To reorient the learning process away from its habitual focus on acquiring isolated pieces of knowledge, the overriding vision in learning must be on problems (e.g. Jonassen, 1994; Hmelo, 1998; Bransford, Brown, &

Cocking, 2000 [particularly Ch. 2]), transdisciplinarity (Nicolescu, 1999, April; Nicolescu, 2002), and consilience (Wilson, 1998).

Reintroducing this overriding concern in our conscious efforts to promote the development of human learning does not mean a radical doing away with everything that has to do with disciplines, content-based curricula, or even rote learning of particular facts. There is abundant evidence to support the idea that such things have their relative usefulness. However, that usefulness gets reduced when it is the only focus in learning and when it cannot be embedded in a larger frame of relevance.

The overall focus on problems, transdisciplinarity and consilience is a vital condition, also, for learning to become, once again, dialogue. It is equally a prerequisite for the development of critical thinking, creativity, and the socialization and contextualization of cognition. Moreover, placing students, and those with whom they learn, eye-in-eye with the real world of whole problems and interconnected knowledge and associated emotions regarding those problems, will be most beneficial to bring back yet another important aspect of our humanity in the learning process: The fact that we function with our entire bodies, not just the neocortex.

The challenge to the distance education community in considering the above implications lies in the need to move past the customary rhetoric of cost-effectiveness and economies of scale. Such notions are based on the idea that the

existing principles of instruction are adequate and merely require the redesign of the processes of their application to benefit larger audiences in affordable ways. I have tried to argue that the problems with the development of learning in the context of today's challenges are much more complex and fundamental. They require the field to be reinvented. The difficulty in meeting that challenge is rather psychological than substantial. The problems are known and the tools are there.

REFERENCES

Allen, B. S., Otto, R. G., & Hoffman, B. (1996). Media as lived environments: The ecological psychology of educational technology. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology*, 2nd Ed. (pp 215-241). Mahwah, NJ: Lawrence Erlbaum Associates.

Amin, S. (2006). The Millennium Development Goals: A Critique from the South. *Monthly Review*, *57*(10) [Online]. Available: http://monthlyreview.org/0306amin.htm [2006, March 6].

Appadurai, A. (1990). Disjuncture and difference in the global cultural economy. *Public Culture*, *2*(2), 1-24.

Argyris, C. (1993). *On organizational learning*. Cambridge, MA: Blackwell Publishers.

Bandura, A. (1969). *Principles of behavior modification*. New York, NY: Holt, Rinehart and Winston.

Boorstin, D. J. (1985). *The discoverers: A history of man's search to know his world and himself*. New York, NY: Random House.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.) (2000). *How people learn: Brain, mind, experience, and school*. Report of the Committee on Developments in the Science of Learning, Commission on Behavioral and Social Sciences and Education, National Research Council. Washington, DC: National Academy Press.

Clarke, A. C. (1992). *How the world was one: Beyond the global village*. London, UK: Victor Gollancz Ltd.

Cole, M. (1991). Conclusion. In L. B. Resnick, J. M. Levine, & S. D. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 398-417). Washington, DC: American Psychological Association.

Creed, C. & Perraton, H. (2001). *Distance education in the E-9 countries: The development and future of distance education programmes in the nine high-population countries*. Paris, France: UNESCO [also Online]. Available: http://unesdoc.unesco.org/images/0012/001231/123157e.pdf [2006, March 6].

Daniel, J. (2000, July). *The university of the future and the future of universities*. Paper presented at the Improving University Learning and Teaching

25th International Conference, Frankfurt, Germany [Online]. Available:

http://www.open.ac.uk/johndanielspeeches/FrankfurtJuly2000.htm [2006,

March 6].

Delors, J., Al Mufti, I., Amagi, I., Carneiro, R., Chung, F., Geremek, B., Gorham,

W., Kornhauser, A., Manley, M., Padrón Quero, M., Savané, M-A., Singh,

K., Stavenhagen, R., Suhr M.W., & Zhou N. (1996). *Learning: The*

treasure within. Report to UNESCO of the International Commission on

Education for the Twenty-first Century. Paris, France: UNESCO.

Edström, L. O., Erdos, R., & Prosser, R. (Eds.) (1970). *Mass education: Studies in*

adult education and teaching by correspondence in some developing

countries. Stockholm, Sweden: The Dag Hammerskjöld Foundation.

Encyclopaedia Britannica (1999). *Encyclopaedia Britannica CD 99: Knowledge*

for the information age. *Multimedia edition,* [CD-ROM].

Erdos, R. F. (1967). *Teaching by correspondence* (a UNESCO Source Book).

London, UK: Longmans, Green & Co Limited; Paris, France: UNESCO.

Faure, E., Herrera, F., Kaddoura, A-R., Lopes, H., Petrovsky, A. V.,

Rahnema, M., & Ward, F. C. (1972). *Learning to be: The world of*

education today and tomorrow. Report to UNESCO of the International

Commission on the Development of Education. Paris, France: UNESCO.

Feldman, D. H. (2000). Foreword. In V. John-Steiner, *Creative collaboration* (pp.

ix-xiii). New York, NY: Oxford University Press, Inc.

Gagné, R. M. (1970/1985). *The conditions of learning* (1ˢᵗ/4ᵗʰ ed.). New York,

    NY: Holt, Rinehart and Winston.

Gagné, R. M. & Briggs, L. J. (1974). *Principles of instructional design*. New

    York, NY: Holt, Rinehart and Winston.

Gell-Mann, M. (1994). *The quark and the jaguar: Adventures in the simple and

    the complex*. New York, NY: W. H. Freeman and Company.

Gell-Mann, M. (1995). What is complexity? *Complexity*, <u>*1*(1)</u>, 16-19.

Gove, P. B. (Ed.) (1993). *Webster's third new international dictionary of the

    English language*. Unabridged edition. Springfield, MA: Merriam-

    Webster, Inc.

Gunawardena, C. N. (1995). Social presence theory and implications for

    interaction and collaborative learning in computer conferences.

    International Journal of Educational Telecommunications, 1(2/3), 147-

    166.

Hesselbein, F., Goldsmith, M., & Beckhard, R. (Eds.) (1997). *The organization of

    the future*. San Francisco, CA: Jossey-Bass Publishers.

Hmelo, C.E. (1998). Problem-based learning: Effects on the early acquisition of

    cognitive skill in medicine. *The Journal of the Learning Sciences*, *7*(2),

    173-208.

Holland, J. H. (1995). Can there be a unified theory of complex adaptive systems?

    In H. J. Morowitz & J. L. Singer (Eds), *The mind, the brain, and complex*

adaptive systems. Proceedings Volume XXII, Santa Fe Institute, Studies in the Sciences of Complexity. Reading, MA: Addison-Wesley Publishing Company.

Jamison, D. T. & McAnany, E. G. (1978). *Radio for education and development*. Beverly Hills, CA: Sage Publications.

Jamison, D. T., Klees, S. J., & Wells, S. J. (1978). *The costs of educational media: Guidelines for planning and evaluation*. Beverly Hills, CA: Sage Publications.

John-Steiner, V. (2000). *Creative collaboration*. New York, NY: Oxford University Press, Inc.

Jonassen, D. (1994). Instructional design models for well-structured and ill-structured problem solving learning outcomes. *Educational Technology Research & Development*, *45*(1), 65-94.

Koestler, A. (1959). *The sleepwalkers: A history of man's changing vision of the universe*. London, UK: Hutchinson.

Koestler, A. (1989, originally published in 1967). *The ghost in the machine*, London, UK: The Penguin Group.

Learning Development Institute. (2001). Web site of the Learning Development Institute [Online]. Available: http://www.learndev.org [2006, March 6].

Learning Development Institute. (2005). *Learners in a changing learning landscape: New roles and expectations*. A dialogue motivated by an ibstpi

research project [Online]. Available: http://www.learndev.org/ibstpi-AECT2005.html [2006, March 4].

Learning Without Frontiers. (2000). Web site of UNESCO's Learning Without Frontiers program [Online]. Available: http://www.unesco.org/education/lwf/ [2006, March 6].

Lederman, L. M. (1999, April). On the threshold of the 21st century: Comments on science education. Paper presented at the Symposium on *Overcoming the underdevelopment of learning* (J. Visser, Chair) at the Annual Meeting of the American Educational Research Association, Montreal, Canada [Online]. Available: http://www.learndev.org/dl/lederman_f.pdf [2006, March 6].

Levin, S. A. (1999). *Fragile dominion: Complexity and the commons*. Reading, MA: Perseus Books.

Marquardt, M. J. (1996). *Building the learning organization*. New York, NY: McGraw Hill.

Meaning of Learning [MOL] project (n.d.). *In search of the meaning of learning* (J. Visser, Chair). Presidential Session at the International Conference of the Association for Educational Communications and Technology, Denver, CO (October 2000) [Online]. Available: http://www.learndev.org/MoL.html [2006, March 6].

Nickerson, R. S. (1993). On the distribution of cognition: Some reflections. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations*. Cambridge, UK: Cambridge University Press.

Nicolescu, B. (1999, April). The transdisciplinary evolution of learning. Paper presented at the Symposium on *Overcoming the underdevelopment of learning* (J. Visser, Chair) at the Annual Meeting of the American Educational Research Association, Montreal, Canada [Online]. Available: http://www.learndev.org/dl/nicolescu_f.pdf [2006, March 6].

Nicolescu, B. (2002). *Manifesto of transdisciplinarity*. New York: SUNY Press.

Pais, A. (1991). *Niels Bohr's times, in physics, philosophy and polity*. Oxford, UK: Clarendon.

Pais, A. (1997). *A tale of two continents: A physicist's life in a turbulent world*. Princeton, NJ: Princeton University Press.

Pérez de Cuéllar, J., Arizpe, L., Fall, Y. K., Furgler, K., Furtado, C., Goulandris, N., Griffin, K., ul Haq, M., Jelin, E., Kamba, A., Magga, O-H., Mikhalkov, N., Nakane C., & Takla, L. (1996). *Our creative diversity*. Report of the World Commission on Culture and Development. Paris, France: UNESCO.

Perraton, H. (Ed.) (1976). *Food from learning: The International Extension College 1971-1976*. Cambridge, UK: International Extension College.

Perutz, M. (1998). *I wish I'd made you angry earlier: Essays on science, scientists and humanity*. New York, NY: Cold Spring Harbor Laboratory Press.

Peters, O. (1994). Distance education and industrial production: A comparative interpretation in outline (1967). In D. Keegan (Ed.), *The industrialization of teaching and learning* (pp. 107-127). London, UK: Routledge.

Rossman, P. (1993). *The emerging worldwide electronic university: Information age global higher education*. Praeger studies on the 21st century. Westport, CT: Praeger.

Rossman, P. (2002). *Transforming human society: The future of higher (lifelong) education: A vision of job training and education for everyone on the planet during this century, planning for all worldwide, a holistic view* [Online]. Available: http://ecolecon.missouri.edu/globalresearch/index.html [2006, March 6].

Sakaiya, T. (1991). *The knowledge-value revolution, or, a history of the future*. Tokyo, Japan: Kodansha International Ltd., originally published in 1985 in Japanese by PHP Kenkyujo, Kyoto, Japan as *Chika kakumei*.

Salomon, G. (Ed.) (1993). *Distributed cognitions: Psychological and educational considerations*. Cambridge, UK: Cambridge University Press.

Salomon, G. (2000, June). *It's not just the tool, but the educational rationale that counts*. Invited keynote address at the 2000 Ed-Media Meeting, Montreal,

Canada [Online]. Available:

http://www.aace.org/conf/edmedia/00/salomonkeynote.htm [2006,

March 6].

Schramm, W. (1977). *Big media, little media: Tools and technologies for*

instruction. Beverly Hills, CA: Sage Publications.

Semenov, A. (2005). *Information and communication technologies in schools - A*

handbook for teachers, or How ICT can create new, open learning

environments. Paris, France: UNESCO [also Online]. Available:

http://unesdoc.unesco.org/images/0013/001390/139028e.pdf [2006,

March 6].

Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning*

organization. New York, NY: Doubleday.

Senge, P. M., Kleiner, A., Roberts, C., Ross, R. B., & Smith, B. J. (1994). *The*

fifth discipline fieldbook: Strategies and tools for building a learning

organization. New York, NY: Doubleday.

Simonson, M. (2000). Making decisions: The use of electronic technology in

online classrooms. *Principles of Effective Teaching in the Online*

Classroom: New Directions for Teaching and Learning, *84* (pp 29-34).

Sharma, Y. (2003). Literacy: a global problem — Written out of the script. *The*

New Courrier, No. 2 [Online]. Available:

http://portal.unesco.org/en/ev.php@URL_ID=10513&URL_DO=DO_TO

PIC&URL_SECTION=201.html [February 22, 2006].

Ulam, S. (1991). *Adventures of a mathematician*. Berkeley, CA: University of

California Press.

UNESCO (2000). *World education report 2000 – The right to education:*

Towards education for all throughout life. Paris, France: UNESCO

Publishing [also Online]. Available:

http://www.unesco.org/education/information/wer/PDFeng/wholewer.PDF

[2006, March 6].

UNESCO (2001, February). *Report on the UNESCO programme – Learntec*

2001. Report of the international expert meeting held in conjunction with

Learntec 2001 in Karlsruhe, Germany.

UNESCO Institute of Statistics (2006). *Children out of school: Measuring*

exclusion from primary education. Montreal: UNESCO Institute of

Statistics [also Online]. Available:

http://www.uis.unesco.org/template/pdf/educgeneral/OOSC_EN_WEB_FI

NAL.pdf [March 3, 2006].

UNESCO: International Institute for Educational Planning (1967a). *New*

educational media in action: Case studies for planners – I, II, & III. Paris,

France: United Nations Educational, Scientific and Cultural Organization.

UNESCO: International Institute for Educational Planning (1967b). *The new media: Memo to educational planners*. Paris, France: United Nations Educational, Scientific and Cultural Organization.

United Nations (1999). *Declaration and programme of action on a culture of peace*, General Assembly Resolution A/53/243. New York, NY: United Nations.

United Nations (2005). *UN Millennium Development Goals* [Online]. Available: http://www.un.org/millenniumgoals/index.html [2006, March 6].

UNITWIN/UNESCO Chairs (n.d.) Web site of UNESCO's UNITWIN/UNESCO Chairs program [Online]. Available: http://www.unesco.org/education/educprog/unitwin/index.html [2006, March 6].

Visser, J. (2000, November). *Learning in the perspective of complexity*. Paper presented at the Santa Fe Institute, Santa Fe, NM [Online]. Available: http://www.learndev.org/SantaFe.html [2006, March 6].

Visser, J. (2001). Integrity, completeness and comprehensiveness of the learning environment: Meeting the basic learning needs of all throughout life. In D. N. Aspin, J. D. Chapman, M. J. Hatton, & Y. Sawano (Eds.), *International Handbook of Lifelong Learning* (pp. 447-472). Dordrecht, The Netherlands: Kluwer Academic Publishers.

Visser, J., Berenfeld, B., Burnett, R., Diarra, C. M., Driscoll, M. P., Lederman, L. M., Nicolescu, B., & Tinker, R. (1999, April). *Overcoming the underdevelopment of learning*. Symposium held at the Annual Meeting of the American Educational Research Association, Montreal, Canada [Online]. Available: http://www.learndev.org/aera.html [2006, March 6].

Visser, J. & Visser, Y.L. (2000, October). On the difficulty of changing our perceptions about such things as learning. Paper presented at the Presidential Session on *In Search of the Meaning of Learning* (J. Visser, Chair) at the International Conference of the Association for Educational Communications and Technology, Denver, CO [Online]. Available: www.learndev.org/dl/DenverVisserVisser.PDF [2006, March 6].

Visser, J., Visser, Y. L., Amirault, R. J., Genge, C. D., & Miller, V. (2002, April). *Second order learning stories*. Paper presented by at the annual meeting of the American Educational Research Association (AERA), New Orleans, Louisiana, April 1–5, 2002.

Visser, L. (1998). *The development of motivational communication in distance education support*. Enschede, The Netherlands: University of Twente (dissertation).

Visser, L., Plomp, T., Amirault, R., & Kuiper, W. (2002). Motivating Students at a Distance: The Case of an International Audience. *Educational Technology Research & Development*, *50*(2), 94-110.

Visser, M. & Visser, J. (2003, October). *"We closed our books and put them away." Learning stories from Mozambique - A critical reflection on communicating about the reality and future of learning.* Paper presented at the International Conference of the Association for Educational Communications and Technology, Anaheim, CA.

Visser, Y. L. & Visser, J. (2000, October). *The learning stories project.* Paper presented at the International Conference of the Association for Educational Communications and Technology, Denver, CO.

Wilson, E. O. (1998). *Consilience: The unity of knowledge.* New York, NY: Alfred A. Knopf.

Young, M., Perraton, H., Jenkins, J., & Dodds, T. (1980). *Distance teaching for the third world: The lion and the clockwork mouse.* London, UK: Routledge & Kegan Paul Ltd.