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BUILDING KNOWLEDGE SOCIETIES

SUMMARY

This document provides some preliminary points for reflection to facilitate discussion during the thematic debate at the 164th session of the Executive Board

BUILDING KNOWLEDGE SOCIETIES

Some preliminary points for reflection

Towards knowledge societies?

In thinking about the future development of knowledge and the possible emergence of knowledge societies, we need to be aware of an initial paradox, one that is intrinsic to future-oriented inquiry and to knowing in general: knowledge, unless we define it in transcendent terms, is never a fixed point that we could hope one day to attain. It is a path, a journey, an act of construction. But the surprising thing about this journey is that the quest is, quite literally, infinite. The more one labours at the frontiers of the unknown, even with the help of the increasingly powerful tools of science, the more the mystery thickens.

The course taken by the adventures of modern science in the twentieth century has transported us from an age of certainty and dogmatism to an ocean of uncertainty and doubt. Determinism has today given way to new scientific paradigms, characterized more by questioning and hypothesis, and to conceptions of nature and history, not to say progress, shaped by the notion of randomness and complexity. However, the conception of time as irreversible yet uncertain paradoxically restores to centre-stage the notions of freedom and creativity. Building knowledge societies is thus no longer a goal to be seen in terms of an inevitable progression towards earthly salvation, but rather an adventure in the realm of freedom.

Another paradox should be mentioned here. Is it meaningful to want to build knowledge societies when history and anthropology teach us that, from earliest antiquity, all societies have been or are, each in their own way, knowledge societies? To be sure, the knowledge systems built by these societies were, to a greater or lesser extent, restricted to circles of sages or initiates and were often based on secrecy. The slow emergence of a public domain of knowledge was inseparable from the development of universality, freedom and the spread of learning and education through the school and university, the book and then the printing press, and from the subsequent worldwide expansion of enlightenment thought and the assertion of human rights. This ideal of a public domain of knowledge, which is fundamental to UNESCO and its Constitution, cannot be seen as a definitive achievement, for we now know that progress can be mortal.

Moreover, knowledge in “historical” knowledge societies, transmitted in accordance with procedures prescribed by tradition, often belonged to the realm of privilege. While such knowledge conferred enormous power and could have a considerable influence on society, ways of thinking, warfare and mastery of production, it did not necessarily have a direct impact on the development of the latter. Its effects furthermore were closely controlled. In this way, major inventions for long periods exerted no great influence on the life of societies, on economic and social development or on History.

On the other hand, as noted by Daniel Bell, “the most important transformation in contemporary society, one that is moreover not yet complete, lies in the unprecedented growth in the codification of theoretical knowledge (...). Knowledge has always been at the basis of communication and likewise of technical progress. However, the codification of theoretical knowledge is unprecedented, and its direct link with innovation, industry and the economy is a new development in the long history of humankind. It dates, in fact, from no more than a hundred years or so (...). Theoretical knowledge and its advances are today the fundamental driving force of change. This phenomenon is particularly evident in biology”.

From this point of view, our age can be seen as a unique moment in human history. The third industrial revolution has too readily been seen as proceeding from globalization, or rather its most recent phase. Is this not to confuse effect with cause? For it is the third industrial revolution, based on the information age and the growing impact of the new technologies on all aspects of human life, that is in the process of changing the world, and of globalizing it.

Based on the cybernetic and biological revolution, that is to say, on the order of codes, currently those of the computer but in future genetic, this third industrial revolution subjects material production to a new empire, that of the symbols of the “programmed society”. The advent of such a society is furthered by the rapid rise of planetary networks, private or public, which are the main agents of globalization and accelerate its progress. If globalization is today identified with the realm of computers, telecommunications, financial markets, the media and networks, it is precisely because the current phase of globalization is above all the product of this third industrial revolution.

Are there then grounds for arguing that we are on the threshold of a new age – that of the knowledge society or societies? To be sure, the new information and communication technologies are not just machine-based systems. They are, according to one expert, “intellectual technologies”. The contexts in which they are generated and disseminated are very different from those of the mechanical technologies on which industrial society was founded: taking the form of programming, reflection on languages and computer algorithms, they are based on the most fundamental scientific knowledge, stemming from the scientific revolutions of the 20th century (quantum physics, particle physics, optics, cybernetics, etc.). The biotechnologies likewise rely on recent and current breakthroughs in fundamental biology and molecular genetics.

The revolutionary advances of science, its internationalization and the radical changes in the production and application of scientific knowledge would seem to herald the advent of a knowledge society. Have we not witnessed a colossal growth of investment in research, education and training, in the public and private sectors alike? However, the most important transformation over the last forty years in the main developed countries has been neither technical nor scientific: it has been the change in the place of women in all institutions of society. Many analysts thus believe that values, political culture and changes in outlooks or ideologies remain one of the essential dimensions of social transformation or permanence.

In the opinion of some experts, the idea of a “knowledge society” is thus unreal. The notion of knowledge is seen as paradoxically vague and not very efficient in scientific terms. To characterize the upheavals through which we have been living in recent decades, reference is often made to the “information society” or even, according to the distinction made by Manuel Castells, the “informational society”. For, according to this researcher, all societies have been information societies inasmuch as they are founded on the “communication of knowledge”. According to Castells, the “informational society” is “a specific form of social organization in which information generation, processing and transmission become the fundamental sources of productivity and power” as a result of the new technological conditions of our time.

We thus find ourselves, in the words of Eduardo Portella, in an “information society characterized by new scales of exchanges”. There can be no doubt that the emergence of an information society, at very different rates in different parts of the world, arouses great hopes as regards access to knowledge, education, communication and culture. Some experts go so far as to speak of a revolution comparable to the invention of the alphabet or printing. But this revolution brought about by the new technologies has to confront a major challenge, namely the extreme disparities of access as between the industrialized countries and the developing countries and those in transition, as well as within societies themselves. Many specialists believe that the computer,

telecommunications and television broadcasting industries are in the process of converging, thereby offering a vehicle for the emergence of knowledge societies. But will the result be knowledge societies or leisure and entertainment societies?

Will the convergence, in the realm of codes, of information, communication and informatics be the cultural event of the nascent twenty-first century or, first and foremost, an economic event? Is it true that the information and communication revolution is bringing about the development of a universal digital language? Digital representation has crucial advantages over other forms of representation: universality of coding, infinite reproducibility at virtually nil marginal cost, ubiquity and instantaneousness. All texts, all images and all sounds can now be represented in the same universal form of a number series.

These far-reaching developments excite great hopes among some specialists and among that section of the general public that counts on having access to the technologies concerned, since the information society creates a new generation of tools that could boost development, education and the transmission of knowledge. Some see in the Internet the lineaments of a new social architecture – more democratic, horizontally structured, self-organized, anti-hierarchical, “open and interactive”.

However, many other observers and specialists offer a more nuanced, not to say opposite, diagnosis. “Much information, little knowledge”, notes Portella. For it is too often overlooked by “technophiles” and the entrepreneurs of the third industrial revolution that information is not the same as knowledge! The growth of networks will not of itself provide the foundations for knowledge societies. It is true that definitions of information and knowledge vary greatly from one expert to another and, as Castells points out, the very attempt to define always introduces an element of arbitrariness into the discussion. The same expert believes nevertheless that such clarification is necessary. Quoting another classic of information theory (Porat), he gives the following definition of information: “data that have been organized and communicated”.

In this connection, it should be noted that information can be, in a very real sense, “non-knowledge”. According to some estimates, half the information circulating on the Internet is quite simply false; and rumours proliferate on the Net. As for knowledge, we should recall with Castells Daniel Bell’s simple but relatively open definition: “a set of organized statements of facts or ideas, presenting a reasoned judgement or an experimental result, which is transmitted to others through some communication medium in some systematic form”. Information and knowledge are thus very different notions; and yet they have common features (the organization and communication of data).

While never coinciding with a knowledge society, the information society therefore has profound – but also very ambivalent – links with knowledge, as well as with social dynamics. We are today experiencing in the very fabric of society the consequences of the third industrial revolution, which – to quote one expert – “makes each of us the motionless engine of an infinity of virtual shifts”. But is this really true of all of us? Which “us” are we talking about? The 5% of the world’s population that has access to the Internet? The one fifth of humanity that possesses the bulk of the resources and income of the planet? This is not just a problem of access. For the third industrial revolution, as UNESCO’s future-oriented studies have underlined, is accompanied by a new age of fragmentation that is today causing rifts in society, the world of work and school, often extending to the family or indeed the nation.

Furthermore, it has frequently been pointed out that the virtual world is in danger of substituting a world of simulacra for the real world – some have even seen in this process a kind of “perfect crime” or technological “artificial paradise”. If this were the case, would there not be a risk of the information society becoming divorced in practice from the knowledge society? Many experts refer to other risks. The spread of “technodeficiency”, arising from a rate of technological

evolution that outstrips the relatively unchanging capacity of human beings to assimilate change, would constitute a sort of “negative” of the knowledge societies that were supposed to emerge. Moreover, by fulfilling the Cartesian programme (“making oneself the master and possessor of nature”), the technologies, which are in point of fact technosciences, would reach the point of “arraigning” the human being, to borrow the expression of a philosopher, and taking control of what is most intimate in man: his genetic inheritance and mental faculties.

Furthermore, technologies tend – for those having access to them – to overcome distance and ensure communication in space: one can acquire information, communicate and also educate and train oneself without having to move. But communication in time, which is called transmission, requires the slow assimilation of knowledge. It takes place not so much through technologies as through human presence, speech and institutions. Communication in space, on the other hand, tends to relegate transmission to the background. Can one, then, speak of a genuine knowledge society if this knowledge – like values – is no longer transmitted or is transmitted inadequately?

Nevertheless, it is clear that the information society can also make a powerful contribution to the emergence of knowledge economies and knowledge societies. There are many who think that we have arrived on the threshold of a knowledge society because the revolution brought about by the new technologies is founded essentially on new knowledge and new information. But the second industrial revolution, post 1850, was also characterized by the decisive impetus given to innovation by science, particularly in Germany.

However, as emphasized by Francisco Sagasti, “the role that knowledge now plays in all human activities is so critical that the concepts of development and progress need to be redefined in terms of the capacity to generate, acquire, disseminate and utilize knowledge”. But, according to Castells, “what characterizes the current technological revolution is not the centrality of knowledge and information, but the application of such knowledge and information to knowledge generation and information processing/communication devices, in a cumulative feedback loop between innovation and the uses of innovation”. Technical innovations, which yield advantages in terms of volume, accessibility, cost and use, make it possible to substitute knowledge for labour as the main factor of production. In the view of Castells, as he underlined in *Keys to the 21st Century*, competitiveness in the new network economy “today lies in the capacity to produce knowledge and process information”. If society is becoming an information society, the economy is becoming a knowledge-based economy.

Yet how do we pass from the information society – albeit coextensive with a knowledge economy – to something different, which is never the product of spontaneous evolution and which we propose, by way of hypothesis, calling “knowledge societies”. Certainly, we should not minimize the cognitive transformations that the human subject undergoes at each revolution based on the “low-impact” technologies (writing, printing, the new technologies): as pointed out by Michel Serres in *Twentieth-Century Dialogues*, with each of these technological revolutions we experience a loss of memory, which has “become collective and objective, whereas we thought it subjective and cognitive”. According to Serres, referring to the work of the prehistorian Leroi-Gourhan, “loss of memory” is a constant of the hominization process, summed up by Montaigne in the phrase: “A brain well formed rather than one well filled”.

In the same way that technologies today perform scientific observations and measurements on our behalf, automatically and in real time, and record the resulting data with no restriction as to capacity, so the human subject is freed from the “obligation of memory”, in the cognitive sense of the term; his or her mind is increasingly liberated from a previous function and may perhaps be able as a result to develop other capacities, as was the case with the hand, which became an organ used for grasping and manipulation when humans adopted an upright stance, or with the mouth, which

became the organ of language when its grasping function became secondary. In this sense, the new technologies revolution could hasten the transition from *memory-based societies* to *knowledge societies*.

However, these slow cognitive transformations cannot by themselves take us from the information society to knowledge societies. For the latter are not the result of chance evolution or of the mere interplay of economic and social interactions. If knowledge is constructed and transmitted, knowledge societies likewise are built up through long-term institutional, social and political mediations and are essentially transmission societies. In this connection, it is perhaps worth exploring three avenues in particular: universal access to the emerging knowledge societies; lifelong education for all; and the universities of the future.

Universal access to emerging knowledge societies

As we enter the twenty-first century, it is becoming more and more clear that the revolutions brought about by the new technologies, which increasingly result from breakthroughs in the fundamental sciences, are the necessary – but not the sufficient – condition for the establishment of knowledge societies. Similarly, the major disparities in the spread of the third industrial revolution and the rise of the information society also affect universality of access to the emerging knowledge societies. Participation in the “civilization of the immaterial” is very uneven as between different parts of the world. For the 600,000 towns or villages and their two million inhabitants that are still deprived of electricity, what can be the meaning of expressions such as “knowledge societies” or “information highways”?

In addition, 80% of the world’s population do not have access to basic telecommunications facilities, which are the key infrastructure of the information society and emerging knowledge societies, and only 5% of the inhabitants of the planet have access to the Internet. It is true that the number of net surfers is growing very rapidly, but the increase is essentially among the one fifth of humanity that possesses the bulk of the world’s resources. The growth of the network is therefore likely fairly quickly to come up against the “glass ceiling” of financial solvency and education.

How can we combat “techno-apartheid” and the digital divide, given that the new technologies constitute, as we know, one of the keys to the twenty-first century, to access to information and to the creation of distance education networks? Should not infrastructure and subscription-rate policies be reviewed since they currently penalize the poorest and favour the richest? What will be the respective shares of the public and private Internets in the global information society? The success of the Web and the “image of transparency”, openness and freedom associated with it too often cause us to overlook that two thirds of networks worldwide are in fact private and that, as Castells wryly puts it, the cogito of this economy of knowledge could be expressed in the form “I think, therefore I produce”. But is it not the case, as Paul Kennedy suggests, that a system in which less than five individuals out of a hundred have access to the Internet, in other words to the public part of the new sources of information, is “anti-democratic and unsound”?

In this respect, the growth of secrecy in the advanced industrial countries, whether we are talking about defence secrets or industrial, financial, technological or commercial secrets, is a matter for disquiet. This growth of secrecy, highlighted in a report by the American senator Moynihan that attracted some attention, seems to contradict all the utopian arguments lauding the transparency and ultra-democratic character of the new information society. What can be done to promote universal access to the emerging knowledge societies if the way is increasingly barred by a new secrecy that is affecting science itself to an increasing degree and threatens to erode

progressively the notion of a public domain of knowledge, which was at the heart of the Enlightenment enterprise?

Simultaneously, the conditions under which new knowledge, skills and know-how are produced, as well as the contexts in which they come into being and develop, bear very little resemblance to what they were barely a quarter of a century ago. The actors, the décor, the instruments and the means of communication are not the same. Scientific and technological research activities constitute a veritable network system, within which more and more specialized research teams and public and private laboratories in the universities and industry are involved in a permanent mutual exchange of data. At the same time as the economic, ecological and social challenges are growing, the share of public resources in research funding has fallen. Here we see another change that is affecting the links between science and society: previously, the research population was mainly to be found in the universities. Over the last half century, the number of researchers has increased to the point where most of them are today working outside the universities, in industrial laboratories, national laboratories, military weapons establishments and other institutions. Moreover, fundamental research is also being developed in industrial laboratories since such research is today directly linked to major industrial applications.

As a consequence, the contract between science and society is, in the words of one expert, “in the process of renegotiation”. However, the new forms of funding and producing knowledge could compromise the values hitherto cultivated by the world of scientific research: for example, by restricting the publication of discoveries and the free access of researchers to research findings, by constantly extending the scope of intellectual property rights, or by provoking conflicts of interest because of the very close links with the bodies financing the research. Will the free and public character of research ultimately prevail? Or do we need to create new institutions – and if so with what resources – to protect and perpetuate this calling?

Finally, it is too often forgotten when one talks about universal access to emerging knowledge societies that one has to begin at the grassroots! Building knowledge societies based on the principle of universality demands that we first settle, at the start of the twenty-first century, the debts of the previous century: the first priority is thus to ensure education for all. Yet it would appear that we are constantly deferring completion of this task, and the 20th century ended upon a partial failure of the great educational mission it had set itself, that of eradicating illiteracy worldwide.

It is as well that the Dakar Forum on Education for All has reminded us that “education is a fundamental human right” and that it has set the international community two essential objectives: “ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to and complete, free and compulsory primary education of good quality”; and “achieving a 50% improvement in levels of adult literacy by 2015, especially for women, and equitable access to basic and continuing education for all adults”.

In the generation to come, we must therefore address *at one and the same time* the unresolved challenges of the twentieth century and those of the twenty-first century. The persistence of illiteracy at the very heart of the industrialized countries, affecting at least one tenth and more often close to one fifth of the population, clearly shows the current shortcomings with regard to universal access to the emerging knowledge societies. In the struggle now being joined for access to knowledge, the *role of teachers* will remain vital. Whatever the changes that their profession will inevitably undergo in the decades to come, it is essential to provide teachers with conditions that enable them to carry out their tasks properly and to enjoy a well-merited improvement in their status within society. If we wish to give priority to education and the building of knowledge societies, we

can only do so by restoring, at the political level, the prestige and authority of teachers and respect for learning, as emphasized by Jacques Delors.

Lifelong education for all

Is it necessary to point out that two thirds of illiterates are women and that basic education for all is one of the best responses, in the medium and long term, to many of the major problems affecting human societies? But education must also be encouraged at all levels. In certain regions where girls are excluded from secondary education, women have on average seven children. When the enrolment rate reaches 40%, the average drops to three children. However, 29% of girls on the planet are still not enrolled in primary school.

Since lifelong education for all will be one of the essential keys in the building of knowledge societies, we must make sure that the “for all” is not forgotten and that women enjoy equality of access with men. The third industrial revolution and the globalization that accompanies it have not yet generated the new social contract that they call for. Humanizing globalization, turning it into a genuine promise and a project, giving it a meaning, this is the objective on which our sights should be set. *Will lifelong education for all*, a theme whose importance was grasped by UNESCO many years ago and which is at the heart of the Report of the International Commission on Education for the Twenty-first Century, chaired by Jacques Delors, *be one of the main elements in this new social contract?* This would be an enormous task, which could be one of the main undertakings in the decades to come. From this standpoint, we should have to turn it into a central challenge for democracy and accordingly set about dismantling the educational apartheid that is growing apace within our school and university systems.

Building knowledge societies should involve not only promoting, wherever appropriate, distance education but also developing the capacity for learning and continuous discovery. The important thing today is not so much learning as learning how to learn. For most experts foresee a great instability of job profiles and frequent changes of profession. From this standpoint, education must no longer be seen as a period of learning limited in time but as a process to be pursued throughout one’s existence. Lifelong education for all is not, then, simply the addition of initial education and continuing education: it presupposes the development of a “learning society”, which has outgrown the restrictive and compartmentalizing notion of the three stages of existence (devoted to learning, working and resting).

But lifelong learning will also have a societal and cognitive goal. The twenty-first century could in this way link up again with the Socratic spirit, which from Antiquity held it to be axiomatic that education was the affair of a whole lifetime. Lifelong education for all would be an essential tool of democracy inasmuch as educated and responsible citizens are its surest foundation.

Universities of the future

From this standpoint, and having regard to the new possibilities open to distance education, do we not need to redefine the role, missions, profile and functioning of the universities? A philosopher said recently: “The universities? They are virtually dead!” There is some truth in the quip. It is clear that, given the new means of delivering lifelong education and the new requirements of lifelong education for all, the universities cannot remain closed in upon themselves. They must break free from the degree factory and ivory tower syndrome and become, at one and the same time, a local development resource and a centre for the lifelong diffusion of education and culture. New educational methods and new relationships with knowledge are already taking shape.

Moreover, the university of the twenty-first century should not enclose itself within narrowly professional confines: it should be socially aware if it wishes to play a decisive role in the extension of democracy and the development of a forward-looking democracy that takes the long-term view. The university should also grasp the opportunity to open itself up to the world of work and the wider world of human activity and to take account of the effective needs of society. In this connection, continuing training constitutes the practical expression of lifelong education for all: the learning career today extends over a whole lifetime.

To guarantee this crucial access to lifelong education, Jacques Delors proposed the creation of a study-time entitlement, a sort of “training voucher” giving everyone the right to a number of years education, to be used as and when preferred, depending on the individual’s career path and academic background. This solution would in particular provide a second chance to those who had left school early. Such a provision would make “education for life” (obviously to be understood as divided into sequences) available to all, in keeping with the stipulation in the Universal Declaration of Human Rights that “higher education shall be equally accessible to all on the basis of merit”.

“From the vantage point of democracy”, observes Eduardo Portella, “the knowledge society cannot be other than a fundamental human right. Knowledge is a fundamental human right, but cannot belong to humanity without being mediated through society (...). Human rights, which are inseparable from the rights of the Other (in terms of idea, culture, creed, colour, sex and integration or otherwise into society), will only become self-evident in a society in which the right to knowledge is guaranteed”.