Learning together in an environment of shared resources:

Challenges on the horizon of the year 2020

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Futures beyond certainty

"Prediction is difficult, particularly of the future." During the more than three decades following the death of renowned Danish physicist Niels Bohr (1885-1962), to whom these words are attributed, the world has become even less predictable. One of the most challenging phenomena of our times is, in fact, exploding change. If we can be sure of anything as regards the now foreseeable future, i.e. the perspective represented by Horizon 2020, then it is that the degree of turbulence in the change patterns we witness is unlikely to diminish. It is easy to understand why.

As far as known, the world's human population has remained relatively stable for thousands of years prior to our era, growing only slightly, but not dramatically, for most of the time thereafter. An estimated 250 million people inhabited our planet around the year zero. The number had roughly doubled around 1650 and it had doubled again around 1850. By that time, advances in medical science, notably the work of the likes of Pasteur, started to ensure that the doubling period would become shorter and shorter. Only slightly more than 30 years were needed for the most recent doubling of the world population from 3 000 000 000 in the mid-sixties to 6 000 000 000 now. As a consequence, we are rapidly reaching the limits of the resources that our planet possesses to sustain its ecology. Naturally, the latter prospect leads to ever increased levels of activity among the six billion of us and the exponential curve that represents the growth of the human population sparks off other exponential growth curves representing the technological and economic development we generate. Exploding change.

The description above is relevant for any consideration regarding changes in the role and meaning of learning in today's world. Learning is a crucial dimension of the human existence. It dispositions us to interact constructively with change. Constructive interaction is not the same as 'reaction to change' or 'adaptation to change.' The latter notions are based on the assumption that

change is a given, the former one envisions human beings as part of the changing environment, i.e. as actors who engage in intelligent behavior as they see things change around them, aware that by doing so they, too, produce change themselves. Such conscious, intelligent behavior, based on what is sometimes called 'deep understanding', is the result of true learning. The degree to which we will be able to interact *constructively* with change, i.e. the extent to which we will be able to develop our capacity to learn and to learn continuously, will be a major determinant of our chances to survive on the planet.

Thus, Arno Penzias,[1] during a video-delivered intervention at a symposium on "Un Siècle de Prix Nobel: Science et Humanisme," held at UNESCO on 8, 9 and 10 April 1999, referred to 'learning to learn' as a necessity. Knowledge now becoming obsolete various times in a lifetime, questioning one's own assumptions has become crucial. Against that backdrop, Penzias noted the frightening situation that children, as soon as they go to school, cease to ask questions. What does it mean to be learning in the perspective of Horizon 2020? What challenges lie ahead?

A triple challenge

Both the schooling tradition and many of the alternative pathways to learning that complement it, such as much of the distance education tradition, still treat knowledge as a commodity, as something that can be passed around, that represents value in monetary terms, and that has an existence independent of the relationship between the beholder and her or his world. Currently emerging notions of the knowledge society tend to reinforce such perceptions. One of the greatest challenges therefore is to move beyond the paradigm that defines learning simply as the acquisition and accumulation of knowledge. We must come to grips with, and be constantly cognizant of, the dimension of development, growth or process of knowledge – of science – in which uncertainty prevails, while moving towards attaining deeper understanding.

A second major challenge relates to the dialogical nature of learning and therefore its essentially social nature. This aspect finds clear expression in the notion of *learning to live together*, one of the four pillars – perhaps the most important one – on which, according to the 1996 report to UNESCO of the International Commission on Education for the Twenty-first Century,[2] learning throughout life should build. This important and overriding dimension of any successful learning experience has long gone unnoticed. Due to the dominance of the traditional

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[1] Co-discoverer, together with Wilson, of cosmic microwave background radiation, for which they shared a divided Nobel Prize in Physics in 1978.

schooling paradigm, learning (at least anything seriously worthy of that name) was usually seen as something that is – and should be – done alone, a view that is perhaps most strongly expressed in how learning gains are being assessed. Even now that this important aspect of learning is getting increased recognition, educators and evaluation specialists are often at a loss as to how to reflect this in assessment practices. As a consequence, moving away from the old paradigm is hard. Whence the enormity of this challenge.

A third major challenge has to do with the nature of knowledge itself. Societal processes of dealing with a vastly growing body of knowledge – growing both in extent and complexity – have, over the centuries, led to increased specialization. A tendency has thus emerged to deal with the complexity of the world by breaking it down into parts that, when dealt with in isolation, could be comprehended. This process has greatly contributed to the advancement of science. However, it has also led to a view of the world, and thus to ways of dealing with it, that are no longer able to account for its complexity. This is becoming problematic as many of the issues the world has to deal with now have, in a very fundamental way, to do with the phenomena of exploding change and rapidly increasing complexity referred to earlier. Whence the need to overcome the shortcomings of the disciplinary structure of knowledge, moving beyond also multidisciplinarity and interdisciplinarity, to start seeing things in a transdisciplinary perspective. In short, we need to rediscover the unity of knowledge.

Meeting the challenge: The school

To meet this triple challenge, fundamental changes are required in the ways in which, both at individual and societal levels, learning and the conditions that promote and facilitate it are being conceived. The major societal institution consciously set up to deal with learning needs, the school system, is in for a fundamental overhaul in terms of content, procedures, internal organization, and the ways in which it interacts with the outside world. At the basis of that overhaul should be the recognition that learning is much wider than the school itself. That being the case, the school has an important, if not crucial, role to play in helping people to prepare themselves for a life of lifelong learning. Equally fundamental in this process of change must be the notion that learning is a social process. The school should thus be envisioned as a learning community. That community is made up of actors – students, teachers, parents, etc. – whose roles flexibly oscillate between learning and facilitation of learning. It should allow those different actors to appreciate the excitement of learning as they experience it individually, but also allow

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[2] Delors, J. *et al.* (1996). *Learning: the treasure within*. Report to UNESCO of the International Commission on Education for the Twent-first Century. Paris, France: UNESCO.

them, as a group, to experience how the group as a whole gains in knowledge and grows in significance as an organic part of the larger society in which it is integrated. School-community linkages are thus essential. Exposure to the idea of organizational learning at the preparatory level is of major importance to recognize opportunities for such learning beyond the school context. Thirdly, the problems with which the school interacts should be real ones. If once again the school is seen as part of the larger world surrounding it, there is no shortage of real problems to deal with. Problem-based learning is essential to stay focused on the unity of knowledge, even if for practical purposes very specific detail may be pursued and a fair effort may be invested in exploring the tremendous wealth of disciplinary knowledge. After all, one must attain disciplinary insights before they can be transcended and transdisciplinary visions ensue. Such a focus on problem-based learning will have profound implications in terms of curricular reform as well as for the way in which the school is organized and the pedagogical principles it applies.

Other components of the learning environment

The recognition that the learning environment is larger than the school is an important one. The school, in fact, should in the first place be seen as one of its components, and a very essential one at that, provided it be adequately conceived. Another important recognition is that the learning environment at large be seen in an ecological perspective. Learning communities of different kinds and at different levels of organizational complexity function within it. They use its resources, interact with each other and with the environment at large, each of them being a potential resource for all other learning entities – whether learning individuals or collectives of individuals – that constitute the environment. To clarify this notion, let us look at the following example.

One component of the larger learning environment could be a community of individuals, such as often from among originally marginalized youths, who, while attempting to become a more meaningful part of their society, engage in, say, the mastery of basic skills and formation of attitudes and motivations to that effect. Those same youths, however, may also be part of a family environment that constitutes another level of learning community in which processes of learning take place particularly at an intergenerational level. Alternatively, or sometimes simultaneously, they may be part of a youth culture such as found in the inner city environment of many an urban context. They may furthermore be found in chat rooms on the Internet, virtual spaces of learning in which they interact with others whose identity may become less explicitly known to them. On a more continuous basis, they are being exposed to media such as TV, radio, the press, and the cinema. This is yet another set of learning contexts of which, unfortunately, the importance gets

attention mostly when it leads to negative consequences. The extent to which such consequences can be negative should meanwhile have opened our eyes to how those same media can be made to benefit humankind. At yet another level of organizational complexity, those same youths may live in towns that have defined themselves as learning cities, thus offering to their various constituent learning communities a wealth of opportunities of mutually beneficial interaction.

It is not at all difficult to extend the above description much more lengthily, contemplating the learning effects of people's pertaining to spiritual communities; economic communities; their political affiliations; their wonder at what world, what universe they live in, and thus their scientific interest; their longing for beauty and fulfillment, i.e. their appreciation for and capacity at art. One could also go on and consider that the youths of our example grow older, becoming mature adults who acquire and take on continually changing roles as circumstances and opportunities lead them to do so. Whatever their stage in life, there will always be reason to learn. The question, though, is: Will there always be sufficient opportunity, will adequate conditions have been created, for people to satisfy their desires and needs to learn?

Learning together in an environment of distributed resources

The structures that have historically evolved in response to the need for human beings to learn are largely no longer adequate. They reflect societal assumptions, particularly those pertaining to the industrial society, that have ceased to hold. Yet, it is understandable that until only a few decades ago learning was still mainly perceived as what one would do to prepare oneself for the rest of one's life. Until then, change was relatively slow and futures could be foreseen with a relative degree of certainty. The adult generation of a particular time could reasonably predict what would be necessary for the generation that followed to prepare itself for its role in society via schooling. That generation, once schooled, would do the same for the next one. Hence, interaction with change followed a generational pattern. Not so any longer. No one graduating from school can any longer have the illusion to have completed her or his learning career. Quite to the contrary, learning will be the major business of the professional future of anyone who now leaves school. Similarly, it will be a major dimension of any person's personal growth along the lifespan.

For learning to play such a more prominent role in life we can no longer be satisfied with the rather narrow and rigid institutional contexts to which it is often confined. Learning spaces should not be restricted by the boundaries of the school. A reconceptualization of the learning environment must recognize the multiplicity of learning spaces. Such spaces can be defined in physical terms, but they are equally expressed in terms of the interactions among people via such

media as the Internet (often – unhelpfully – referred to as virtual space or cyberspace) and they also have an important time dimension, a-synchronicity becoming an increasingly important feature of many learning experiences and the communities that generate them.

Some of the elements of the learning environment that one can envision in the perspective of Horizon 2020 are already there. They are present in the school systems, particularly those that struggle to redefine themselves in terms of the requirements of the post-industrial era. They are equally present in the growing practice of distance learning to the extent that such practice generates and sustains dynamic learning communities, rather than creating replicas of the traditional school model. They can be found in the – often inspiring – instances in which increasingly available and accessible interactive technologies are being used in imaginative ways to create learning communities whose members are spread around the globe, sometimes gearing their learning towards issues of global importance and relevance. They are found in the example of teachers who become aware of their role as learners and learners who realize their potential to facilitate the learning of others. They are present when members of different generations develop the capability to mutually learn from each other; when learning becomes a shared experience among people who speak different languages and who are able to appreciate and explore the diversity of cultures among them; when centuries old local knowledge systems and modern science start interacting with each other in a constructive fashion, etc.

Integration, inclusiveness, openness and flexibility are the most important dimensions of the learning environment required in the perspective of Horizon 2020. In such an environment, traditional distinctions such as those between formal, non-formal, and informal learning, as well as those between distance education and face-to-face instruction, will become increasingly irrelevant. The crucial question underlying its development is the following one: Given all existing learning needs of all people of all ages in a particular society, independently of their particular circumstances, how can those needs best be met, in a way that optimizes the use of all available resources for learning? A serious look at this question should make two things clear. One is that care for the learning environment must be the shared responsibility of a broad partnership of stakeholders, particularly including the learning communities themselves. The other one is that any predetermined choices, such as those that emphasize particular technologies (for instance the so-called new information and communication technologies) or approaches (such as distance learning) as the basis for its development, are unproductive. Against the above background, the challenge to UNESCO lies particularly in the need for any such body to be able to regenerate itself to become a living social entity, fully integrated in a world in which it plays a role the importance of which can only be measured in terms of its own capacity to learn.