

# THE CONDITIONS OF LEARNING IN THE WORLD OF THE TWENTY-FIRST CENTURY

CONTRIBUTION TO THE  
DEBATE ON “THE NEW PEDAGOGIES STEMMING FROM NEW TECHNOLOGIES”  
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BY

JAN VISSER

PRESIDENT, LEARNING DEVELOPMENT INSTITUTE (LDI)<sup>1</sup>

## **What’s in this paper?**

In this paper I shall first question the relevance and appropriateness of the assumptions underlying the proposed theme of the debate. In doing so I shall argue for a broadening of our frameworks of thinking regarding the two key concepts mentioned in the title of the debate: “pedagogy” and “technology.” I shall also question the inherent assumption that pedagogies *stem* from technologies and argue for an approach that looks at technology, not as an autonomously developing phenomenon, but as an evolving aspect of the human condition. Over and above these issues, I argue that the more important question to be asked is: “What does it mean to be learning in the 21<sup>st</sup> century.” The answers to the latter question should lead our thinking about how learning is to be promoted and facilitated, a context in which technology appears as an enabling factor.

Considering the nature of the emerging technologies – particularly their ability to allow for interaction, sharing and collaboration – the contribution of technology to reshaping the learning landscape is potentially significant. However, to reach this significant impact, it is necessary to quit current frequent practice to replicate outdated pedagogical models with new technological means. Instead, one must start rethinking the world of learning from scratch, inspired by knowledge about current imperatives regarding human and social development, informed by what is now known about how humans learn (including the neurophysiological basis of that process), and having in mind the full range of technological options available to the world (not just the emerging technologies).

## **The question of pedagogy (or who’s responsible for whose learning?)**

The relationship between new pedagogies and the emerging information technologies is best discussed in a context that places both technology and pedagogy in a

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<sup>1</sup> Related material of interest is available online at the Learning Development Institute website (<http://www.learndev.org>) and the website of UNESCO’s “Learning Without Frontiers” program (<http://www.unesco.int/education/lwf/>), which I directed during the second half of the past decade.

wider framework of considerations. Failing to do so entails the risk that important opportunities to respond to the specific concerns of our time are missed.

The theme of the debate includes the term “pedagogy.” The literal meaning of that term connotes learning among children. However, learning is a never-ending process. The term should thus be generalized from its original meaning to refer to *learning at any age*, as is often indeed done in much of the current usage of the term. Alternatively, it should be complemented by the term “andragogy,” referring to learning by adults.

Both the terms “pedagogy” and “andragogy” have connotations of external control, the Greek verb “agein” meaning “to lead.” So, there is a clear assumption here that, in order to learn, there needs to be someone who takes control and leads the learner. In the original meaning of the term “pedagogy” that assumption is even more specific: It requires an adult to lead the child. There is reason to critically question these assumptions. What is/should be the role of others in someone’s learning? To what extent is that role one of “leading” the learner? Whose role is it to lead? Who learns in the process of someone leading someone else? What other modes of human interaction support learning?

The idea of pedagogy as we still know it today stems from a time, which in fact is not so long ago, perhaps only half a century, when it still made some sense to think of learning as something that most people would engage in mainly during the early years of their lives. The idea, of course, was firmly embedded in the conception of human beings as resources for the workforce of the industrial age. One learned to earn a living. Once educated one would apply what one had learned for the rest of one’s life, without much need to go back to school. Within that same picture, one sees adults as masters of the various trades. Naturally, therefore, adults were assumed to be in the position to help children to acquire the skills they needed. Hence pedagogy. As most of us will have discovered, this time is definitely over. Like alkaline batteries, every diploma, every certificate should carry a date stamp: “Best if used by .....

### **Learning for a non-linear life**

There is a more fundamental problem. The traditional conception of the school is still largely based on the assumption that it is possible, by learning a variety of subjects, to be prepared for a career. Learning in school is largely skill-oriented. A well-designed and well-managed schooling process can be expressed in specific learning outcomes, the attainment of which can be measured by more or less reliable means. So far so good. The system functioned reasonably well as long as the set of skills required in life didn’t change too fast. Of course, people learned many other things. However, the process by which those other things were learned had nothing to do with the school, so, people wouldn’t think of those things as having been learned. Their pursuit seemed less serious. Over time, school has become the trendsetter for what it means to be learning. If no obvious pedagogy is involved, it isn’t learning.

One finds these perceptions reflected in the battle that had to be fought for distance education to acquire credibility and esteem. So serious was that battle that it

could only be won by carefully ensuring that distance education systems would be modeled, as closely as possible, on the norms of the traditional school systems. Indeed, many definitions of distance education exclude from their domain such things as learning a language by simply using a teach-yourself book accompanied by audio-visual support materials. There must be a teacher involved somewhere, and that teacher can't be the learner him or herself.

While interviewing people about their lifetime learning experience, I have come across a man, highly educated and highly accomplished by most people's standards, well advanced in the pursuit of his multiple goals, who told me he had never learned anything. I was surprised. Unlike most people he had chosen to lead the life he had wanted for himself rather than any of the pre-packaged options society had had available for him. Making all his various moves in a life of being a child psychologist, an entrepreneur, a musicologist, a musician, a musical instrument maker, a writer and a bookseller who also offers homemade scones and tea in his bookshop, living in a variety of countries, immersed in different languages and cultures, how could he not recognize that learning had been key to everything he had done? The answer, of course, is that, as for so many other people, "learning" for him was what he was supposed to have done in school.

His has been the life that most people who grow up today will live, not by choice, but by force of circumstance. There are no stable career patterns any longer. The most striking feature of our time is change, explosive change, change of which the rate changes all the time. Hence, whoever grows up now needs to be able to interact with change. The world being as fragile as it is, such interaction with change must be constructive. If not, we are in for problems, big problems. The recognition that the world is diverse and fragile, and that it must remain diverse and fragile if it is to sustain life, is crucial. Every human being now stands face to face with six billion other human beings. Figuring out how, on an overpopulated planet with limited resources, we can live together constructively, in peaceful and harmonious ways, developing a culture of tolerance and respect, is one of the important challenges of our time. Learning has everything to do with that challenge. But it's a different kind of learning than what we used to do in school, much richer and much more all pervasive. It's a kind of learning we can't simply arrive at by reinventing past practice with new means. We must go back to the drawing board, or rather, perhaps, to the canvas, to create a new picture.

### **Instruction or learning?**

Common use of the term "pedagogy" has attributed to it the meaning of "the art and science of teaching." Clearly, the reference in the theme of the debate to "pedagogy" places an emphasis on teaching and the instructional context in which teaching takes place, thus assuming that instruction is a major factor for the promotion and facilitation of learning. This assumption is debatable. Most of the research on learning has focused on learning in instructional settings. As people do indeed learn by being instructed, this research bias has created the false impression that people learn most of what they learn in an instructional context. Not so. To correct the bias, one must broaden the scope of questioning. Rather than looking at such details as to how effectively learners acquire a particular ability under specific instructional conditions, one can also simply ask people

to look back at their lifetime history of learning and identify what was really meaningful and important in it, and why they considered those things important. In addition, one can ask them what most contributed to those meaningful learning experiences, i.e. what specific conditions promoted and facilitated them.

Such case story research applied to the learning history of real people was initiated by the Learning Development Institute in collaboration with Florida State University in the beginning of 2000, with first results reported at the end of that year (Y. L. Visser & J. Visser, October 2000). Other institutions, notably the University of Northern Colorado and the University of Massachusetts at Amherst, have since joined LDI in expanding this research effort. The learning stories of most people reveal a much more limited role of the instructional context in the overall learning experience of people than is normally assumed.

This does not mean that instruction is unimportant. Rather, it means that we are underpromoting and underfacilitating learning by concentrating most of our efforts on instruction alone. In other words, *it is important to look at the role of instruction – and the pedagogical and andragogical processes involved in it – as a constituent part of a wider learning landscape, a landscape that also includes other elements that are essential for people’s learning.* The term “landscape” is used here metaphorically to stress the importance of looking for completeness and integrity, harmony and beauty, in appreciating how different spaces in which people learn hang together and are weaved into a comprehensive whole. The learning landscape should be recognized to comprise such important elements as, for example, the media landscape and the socio-cultural organization landscape, in addition to simply the instructional landscape. A broadening of view is thus urgently required. Such a broadened view should focus on learning and look, in that context, at instruction and other modalities to promote and facilitate learning in relation to both broad and specific human and social development goals that form an interconnected, ecologically harmonious, whole.

### **The danger of asking the wrong questions**

There are at least two reasons why we should be careful with giving prominence to the new information technologies in our considerations about how the world of learning is changing or should change. These reasons are the following ones.

First, it is potentially dangerous to start from the assumption that every new technology calls for different ways to facilitate human learning. The learning process and our ways of knowing are in the first place determined by the features of our body. The human mind is an embodied mind. Its potential and its limitations are determined by who we are and how we developed throughout evolutionary history. Technology extends the capabilities of our bodies, both in terms of our motor behavior and our cognitive functioning. Technology must thus be considered not as an isolated phenomenon, but as an evolving aspect of the human condition. It is important to draw attention in this context to the obvious fact that the human condition, including its technological dimension, varies widely across the globe, it being a big shame that at the global level we still accept that a large proportion of the world population is deprived of the most basic

conditions that, if present, would allow it to make a significant contribution to the advancement of human knowledge. The world is shortchanging itself by letting the situation continue. It's also not living up to its moral obligations.

The second reason has to do with the nature of technology itself. The physicist Freeman Dyson (May 2000) distinguishes in his acceptance speech for the 2000 Templeton Prize on "Progress in Religion," between gray and green technology. Green technology, the technology based on everything that lives, he explains, started ten thousand years ago with the agricultural revolution. Gray technology – mining, metallurgy, machines (including the current variety of information processing machines) – came much later, about three thousand years ago. For the past couple of centuries, gray technology has rapidly moved ahead of green technology. However, the last 50 years have laid the basis for a possible reversal of the trend. Our understanding of life and its fundamental processes, while still rudimentary, has grown exponentially during that period and a great part of human needs can now be satisfied through green technology. A different balance between gray and green technology could emerge, one that is more beneficial in terms of long-term sustainability as well as in terms of equitable sharing of the world's inherent potential. Where this balance goes depends less on what we know about the scientific principles underlying both green and gray technology than on policies, our conscious decisions at societal level to either promote or discourage particular developments.

I'm quoting Dyson because his observations are relevant in the context of our debate. Looking at technology as the factor that determines what the world of learning should look like, as the theme of our debate suggests, is standing the logic on its head. The development of technology does not escape from our will, unless we accept the principle that market forces should not be interfered with (which then would still be a willful act of deciding not to interfere). Information processing technology (still) being a gray technology, I conjecture that it makes sense to place the theme of our debate in the wider context of technological development in general and thus in the context of policy considerations regarding what to promote and what not to promote. Obviously, such generic considerations must be based on a clear understanding of the needs that must be satisfied and the various alternatives available to do so. As far as our debate is concerned, those needs pertain to the development of human learning across the globe, not just in a few wealthy countries with some afterthoughts for the rest of the world.

In the above context it should be considered that newly invented technologies don't necessarily drive older technologies out. In most countries we still walk and ride bicycles in addition to using cars. Similarly, the technology of paper and pencil is not to be discarded in a world that has also invented handheld PDAs. Being an early adopter, I have used the latter for more than ten years, spending a couple of thousand dollars while frequently substituting newer models for outdated ones so as to keep up with my perceived needs, but I have recently rediscovered that the little notebook that I now carry in my shirt pocket, does a remarkably good job as well, often less clumsily than its electronic equivalent, and it costs me less than a dollar every year or so. Archiving them is no big deal either. Does this invalidate PDAs? No, it doesn't. But it sets a different

balance between the use of earlier achieved technologies and the emerging ones. Unfortunately, the way an uncontrolled market behaves, based solely on economic principles, makes it difficult to implement such personal decisions on a large scale, just as it is difficult, and sometimes dangerous, in a country like the United States, where I live intermittently, to walk or ride a bicycle instead of doing the less healthy thing and drive a car. An adequate policy environment, resulting in appropriate infrastructure, is essential to allow patterns of behavior to shift.

**The key question: “*What does it mean to be learning in the 21<sup>st</sup> century?*”**

The overriding issue implied in the proposed debate pertains to a single question: “*What does it mean to be ‘learning’ in the 21<sup>st</sup> century?*” The answer to this question has to do with two things: the conditions of the world we now live in and the nature of our current knowledge, of our consciousness. Both have changed dramatically during the past century, so much that it may be argued that on both accounts we have reached critical points that require serious and thoughtful attention.

Concerning the conditions of today’s world, the following can be said. The universe is believed to be more than ten billion years old. Hominid development on planet Earth started some three million years ago, likely remaining relatively stable most of the time. At the start of the agricultural revolution, ten thousand years ago, there may have been as many as eight million people. After that, the human population grew exponentially, reaching around 250 million at the beginning of the Christian era, 500 million in 1600, one billion in 1800, three billion around 1960, and six billion presumably in 1999. Should this be considered a problem? It probably should, as it is not yet foreseen how the process can become stabilized and how demographic growth can be reconciled with sustainable exploration of the world’s resources. The word “sustainable” in the previous sentence I propose to mean “in such a way that no consequences result the response to which can not reasonably be seen to be under the control of the current generation or those future generations who can still hold the current generation effectively responsible.”

The out-of-control demographic growth does not come alone. It is linked to all manner of other phenomena. The need to cope with increasing population density – or for others the desire to exploit it commercially or otherwise –triggers off a variety of related explosive developments, among other areas in the domain of technology. These various developments are coupled back to each other and thus mutually influence each other, leading to higher order effects. Ultimately, what happens in such a situation depends on the behavior of everyone, but not in a way that can be linearly foreseen. Shared visions of the whole, where we are and where we want to go, are therefore important. For the world as a whole to remain sane, there is a need to develop a higher standard of ethical and aesthetic consciousness than is currently available, both at the level of individuals and that of communities and societies. Mechanisms that promote the development of such consciousness are thus essential, pointing, among other directions, to the role of organizations such as those that pertain to the family of the United Nations, which need to be continually revamped in accordance with the evolving conditions of their time.

Interestingly for our debate, the emerging information technologies may well play a role in facilitating the evolution of such mechanisms.

The overall theme of the colloquium correctly makes reference to religion and historical memory as dimensions of the debate on the cultural implications of the 21<sup>st</sup> century. In its original meaning, the word “religion” refers to such concepts as piety, reverence, conscientiousness, and our ability to perceive of ourselves as tied in with and belonging to a larger context. One doesn’t have to go to the extent of becoming irrational or dogmatic to espouse such ideas. Quite to the contrary. Institutions that require blind adherence to dogmas, or the renouncement of such valid human capabilities as analyzing the world in rational terms, don’t deserve to be called religious. They nurture closed mindsets that are counter to religious experience. I contend that religion is important and that our debate should, among its multiple other dimensions, also focus on our spiritual selves. The relationship of this position with our interest in the technology issue is probably best brought out by once again quoting Freeman Dyson from his May 2000 speech:

*The great question of our time is, how to make sure that the continuing scientific revolution brings benefits to everybody rather than widening the gap between rich and poor. To lift up poor countries, and poor people in rich countries, from poverty, to give them a chance of a decent life, technology is not enough. Technology must be guided and driven by ethics if it is to do more than provide new toys for the rich. Scientists and business leaders who care about social justice should join forces with environmental and religious organizations to give political clout to ethics.*

The consciousness of being an integral part of a larger whole, of belonging to the universe, both with regard to our bridging the past with the future and in terms of being connected to all that surround us, is an essential experience that compels us to think about what we should do and what not, what is right and what is wrong, i.e. ethics. At a more refined level it also leads us to think about what is beautiful and what is ugly, i.e. aesthetics.

If the above considerations are indeed important, and I believe they are, then we must liberate learning from the narrowness of the conceptions that surround it, that tie it in with the simple achievement of linearly defined goals, connected to often mundane pursuits and utilitarian processes to reach these goals, a context in which one is necessarily drawn to the “merchandization” paradigm, discussed at a different roundtable during this colloquium. Isn’t the fact that we need to discuss this at all a sign of the loss of ethical consciousness and appreciation of the beauty of human growth?

The second aspect that I wanted to touch upon under the heading of “*What does it mean to be learning in the 21<sup>st</sup> century?*” is that of the state of human consciousness at this juncture in time. Human knowledge has made great strides during the past century, particularly so in my own field of origin, that of theoretical physics. Being what we are, bodies of flesh and blood, we interact with the world in the first place at the measure of our own physical being. We thus get to know the world as expressed in terms that relate to our own existence. Throughout the history of the development of knowledge about our

world and ourselves, we have gradually succeeded to expand beyond that limitation by building tools and machines. Telescopes, microscopes, particle accelerators, ships, airplanes and spacecraft have thus expanded our horizons as well as our perceptual abilities. Ångström units and light-years have, by extrapolation, still some connection with our ordinary perceptions, but the further we go in the process of expanding our horizons, the more difficult it becomes. Gradually we move to a situation in which the meaning of what we know is less and less connected with our capabilities to comprehend the world in terms of our own bodies. This is even more clearly the case when our habitual perceptions of space-time related phenomena break down, as became clear in the beginning of the past century with the development of quantum physics.

A more fundamental change has taken place as well. Science, and for that matter technology, owe much to the adoption of ways of acquiring knowledge that are based on the principle that the human mind should be seen as excluded from the world it is trying to become conscious of. In that view, the things of the mind are considered as separate from the objects about which knowledge is being sought. The process assumes that knowing means creating representations in the mind of the world outside the mind. The mind is thereby seen as essentially detached from the body. That position has become untenable. In the first place, neuroscience has greatly contributed to a better understanding of the role of that integral part of our body, the brain, in cognition. It has thus put the mind back where it belongs, in the body. Second, to know the world we must, in one way or the other, interact with it, whether directly with our bodies or through the use of its various technological extensions. We are inescapably ourselves part of the systems that we become conscious of. The recognition of our being part of a larger whole, as already referred to above in the context of our religious, ethical and aesthetic experience, is thus equally the basis for our scientific experience.

### **The nature of learning**

From what we have seen above, human learning is a multi-faceted phenomenon that requires flexibility and openness for its development. Much of established instructional practice runs counter to these requirements, making change imperative. More importantly, the conditions of learning must be developed not only in instructional contexts, but also in multiple other parts of the learning landscape. Thus, a serious reconsideration of, for instance, the media environment as a space for learning is called for. In addition, a look at different socio-cultural contexts of human organization – the family being one of them – in terms of their role in nurturing human learning is an equally important requirement. The notion of the “learning community” presents itself as a particularly powerful concept in rethinking and reshaping the world of learning.

After all we have learned about learning and all the debate about knowledge as something that we socially construct, it should hardly be necessary to stress that learning is not a process of filling up empty vessels with information. Unfortunately, though, one must continue to repeat those things, so many of the current applications of information technology to create opportunities for learning, so-called e-learning, being based on exactly that completely outdated metaphor. Learning is a *disposition to dialogue*; it is based on openness of mind and willingness to interact, i.e. on the readiness to give and in

the process receive. It is not based on passivity and the desire, or social obligation, to receive and being filled until full and labeled, like a bottle, with a diploma or certificate.<sup>2</sup> Never is there anything static in learning. Terms like “learning achievement,” “being educated,” or “completing one’s degrees” create the wrong impression about learning.

### **The emerging picture**

In the broad picture that emerges, learning pervades all aspects of the life of human beings along the entire lifespan. In that perspective, learning is an inherent feature of the life of both individuals and purposefully organized collectives of human beings. If everyone learns, the distinction between learners and teachers becomes less relevant. Consequently, *pedagogy and andragogy must be rethought in a context in which everyone is both a learner and a facilitator of the learning of others*, people flexibly moving between different communities that contribute to the development of their learning and to whose collective learning behavior they contribute. *Technology becomes an important enabling factor in that process*. Current technologies have features that position them strongly to reinforce the use of already existing technologies, as well as for their own autonomous use, in generating and supporting such learning communities.

### **Recommendations**

Following are some recommendations – a far from exhaustive list – concerning the debate on the role of technologies in the promotion and facilitation of learning as they relate to the above analysis.

- Considering the complexity of the issues involved, the debate should be conceived as part of an ongoing process.
- The debate should itself be seen as a learning process, i.e. an expression of openness of mind and willingness to engage in dialogue with the aim of contributing, in a constructive manner, to change. It should not be driven by single-minded principles, such as economic interests.
- Learning should be conceived of as a dialogic activity, essential for human beings to interact constructively with their ever-changing environment. Learning therefore never ends and is equally essential for all of humanity, irrespective of space, time, age, personal attributes such as gender and ethnicity, or external circumstance. As a corollary of this recommendation, it should be stressed that learning in humans starts nine months before birth. Attention to human development at the very early stages of life should be considered a key issue.
- The promotion and facilitation of learning should be explored in a rich multiplicity of contexts, the instructional context being only one of them and not necessarily the most important one. Different learning contexts should be seen as mutually reinforcing each other.
- Thinking about the conditions of learning should focus on such big issues as ethical and aesthetical considerations as much as on the more mundane and specific human needs, related to how individuals can best realize themselves within their socio-cultural and economic environment.

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<sup>2</sup> For a more elaborate treatise – and an operational definition of learning that reflects those ideas, see Visser (2001).

- An orientation towards meaningful problems in any deliberately structured learning context should be sought as such orientation will often in a natural way direct attention to both the bigger and smaller issues mentioned in the previous point. Research has also shown that problem-based learning most effectively guarantees transfer to the real-life context (e.g. Bransford, Brown & Cocking, Eds., 1999). Moreover, an orientation towards meaningful problems will usually require approaches that are not limited to single disciplines but will instead encourage the development of transdisciplinary insights.
- Learning should be conceived of as embodied and as having to do with the entire human being, including the person's emotive capabilities.
- The development of learning should be promoted at both the level of the individual and of the social entities that individuals are part of. The concept of "learning community" is to be explored as a key construct for attending to learning at multiple levels of organizational complexity.
- Technology, as it relates to the promotion and facilitation of learning, is to be explored in an integral manner, different technologies being able to reinforce each other and the choices among them depending on, among other factors, the need that development must be sustainable.
- Considering the essentially dialogic nature of learning, if any focus is to be put on specific features of technologies, those that allow for sharing, collaboration and interaction are to be seen as the most promising ones.

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