

Questions that trouble me

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Troubling questions are questions with which we share our life. They don't go away. We accept that we may never find a clear-cut answer to them, even though occasionally we may. But the questions, and their potential answers, will change over time. The challenge of living with such questions gives meaning to our life. They are the source of the passion with which we pursue them.

Question: Does 'Building the Scientific Mind' mean the same to other people (particularly my BtSM friends) as it does to me? In other words: Is there shared understanding of BtSM?

Background: My own perceptions of what BtSM entails have greatly changed over time since I first suggested BtSM as an important focus for improving human learning in 1999. Yes, 1999. (Click [here](#) for a brief history of BtSM.) I would currently describe 'Building the Scientific Mind' as *a lifelong process of human development to acquire a way of being in and of the world, inspired by the heritage of the millennia-long history of the human pursuit of knowledge (scientia) for the advancement of understanding and wisdom, comprising*

- *habits of thinking and dispositions in approaching the world, as well as*
- *values, ethical concerns, aesthetic considerations, and attitudes, alongside*
- *mastery of a complex array of skills and mental capabilities in select domains, with such 'select domains' depending on an individual's interests and prospective needs and desires, which are different for a carpenter, a theoretical physicist, or a musician.*

I'm still thinking that I can describe this even better, with a stronger focus on underlying human tempers such as passion and resoluteness and postures such as resilience, and stressing the importance of embodiment. That's possibly something for the book.

Note also that the words 'science' and 'mind' have been totally eliminated from the above description. I shall be happy to explain and discuss the reasons why.

Question: What is it in the building of the scientific mind (as defined above) that may help construct the defenses of peace in the minds of women and men?

Background: This is perhaps the most challenging question. UNESCO has had these words by American poet and playwright Archibald MacLeish inscribed in the preamble to its constitution since 1945. They are a reflection on the times of war that preceded UNESCO's coming into being, considering that "wars begin in the minds of men." No simple answer exists. There are no clear and simple answers in response to fuzzy and complex problems. Perhaps it's exactly because BtSM represents itself a complex area of human development that the educational practice implied by BtSM may effectively be applied to address the question at hand. It's the reason why we have it as a lead theme for this final BtSM colloquium.

Question: *Can we imagine planet earth, its biosphere, and humanity in the year 42015? What can we learn from such a prospective view against the backdrop of what we may learn by looking back at the heritage of our forebears who lived, as long as forty thousand years ago, in the area where we meet?*

Background: In the Serra da Capivara we'll have the wonderful experience of appreciating the cultural heritage of a long gone past and get a glimpse of human existence in 40000 BP. In the year 42015 those who live then (assuming human life still exists) may contemplate the heritage we left behind. If they are lucky, they may have access to a video documentary about the cave dwellers of the 21st century. If that video documentary will survive the millennia is uncertain, but it is certain that it exists now as it was recently produced. We will see that documentary and be able to compare our state of being with that of the cave dwellers of yore. I look forward to learning from what we learn.

Question: *What inroads can we make into imagining the learning landscape of the future, based on our appreciation of what it means to be human in the 21st century and beyond?*

Background: The look and feel of the learning landscape has hardly changed over the past several hundred years. We still see a strong focus of formal learning and general neglect of the value of the learning that takes place in informal settings. Yet we spend much more time learning in informal environments than the relatively short period in life we go to school or learn later in life through training and additional schooling to stay attuned to the demands of a changing work environment. Consequently, the general perception of learning is that "it's what you do in school." I have written in 2000 (together with Yusra Visser) a paper *On the Difficulty of Changing Our Perceptions About Such Things as Learning* and followed through with numerous other publications aiming at addressing this 'difficulty' (of which an incomplete selection is available on [ResearchGate](#)). However, success so far is at best only modest. No doubt, it requires a community to foment the desired change. That community is growing, but slowly. We are all part of that community, there to develop and spread visions regarding the evolving learning landscape of the future. I feel attracted to exploring in the first place what can be done from a design perspective to bring into being an overall facilitating learning ecology and within that learning ecology specific facilitating learning environments for the building of the scientific mind. I intend to take this up with a couple of colleagues from the instructional design field.

Question: *What technological, pedagogical and content knowledge and know-how will determine the effectiveness of future learning environments? What else is needed?*

Background: Lee Shulman coined the term Pedagogical Content Knowledge (PCK) in the 1980s, calling attention to the need for mastery of integrated knowledge from different domains in the training of teachers. As technology became an increasingly more important factor during the past three decades, the concept widened to Technological, Pedagogical and Content Knowledge (TPACK). A condensed article regarding these developments is available [here](#). Thinking about TPACK (and before that about PCK) has focused on the crucial role of teachers in the existing traditional learning environment. But that role may change, and so may the role of learners, as we argue in *Learners in a Changing Learning Landscape*. What will likely remain is the need for solid presence in the learning environment, shared across members of the communities that populate these environments, of relevant technological, pedagogical and content savviness. In view of rapid technological developments, can we reflect creatively and constructively on what is needed and how it can be brought together in an integrated fashion? More importantly, can we think of what else is needed that goes beyond TPACK.

Question: *How come those who spend years and years in school still exit it with deficient abilities to use their intellectual faculties critically? Can this be repaired? How?*

Background: Schooling practices are quite universally seen as being among the most strongly resistant to change. Many of my friends thus conclude that one shouldn't even try to bring about change within the system but rather apply oneself to creating a learning ecology without schools. I'm not so sure. I can well imagine—in fact, I have seen—that radically different schooling practices are possible and that they are indeed able to awaken and foment in students the capacity to think freely and autonomously. The problem is that where such alternative narratives emerge they are generally not welcomed but feared. Students may often still have to submit themselves to state imposed assessment practices that value achievements that are considered relevant in the traditional schooling context but that are counter to what such alternative models attempt to achieve.

Question: *What has gone wrong with religious sentiment? In the face of evolving secularization, what is it in the cultural heritage of humanity's religious past that should possibly be preserved and remain available for contemplation by future generations.*

Background: Archeologists have discovered evidence of religious impulses among our ancestors that go back as far as 50,000 years ago. The most primeval expression of such impulses is found in burial practices and forms of veneration of the dead, suggesting understanding of the fact that one's own existence is tied in with a world larger than oneself, connected with a meaningful past that preceded one's existence and a future that will continue beyond it. This is in keeping with the literal meaning of the Latin verb *religare* (to bind), which is often suggested to be the root of our current word religion. Such preoccupation with death and the dead at once serves to raise questions about what it means to be, in particular about what it means to be human. The question of being has kept philosophers from Plato to Heidegger busy. In fact, it continues to bother us all, ordinary mortals, as well. Interestingly, the ritual practices surrounding the dead are not limited to Homo sapiens. They have also been found among Homo Neanderthalensis. In our species, religious practices have evolved over the millennia. Consequently, the definitions of what pertains to religion and what not have become more elaborate and more convoluted over time. The track record of the current varieties of religion, particularly the monotheistic institutionalized religious traditions, is, in my view, troubling. While I recognize the valuable contribution of the invention of religion by our ancestors as a way of reflecting on our existence, most current expressions of religion seem to be out of touch with the state of understanding that has resulted from the developments in philosophy and, particularly, the natural sciences. Issues pertaining to the 'science and religion' debate have been discussed at various BtSM colloquia. If there is time during this final colloquium to take the issue up again, my question may be of interest.

Question: *What will we want to learn most when space exploration finally results in making contact with a distant world where intelligent self-conscious life once flourished but went extinct before we arrived on an archeological mission to understand the future?*

Background: The systematic search for extraterrestrial intelligence has been an ongoing effort since the creation of the SETI Institute in 1984. It has recently been given a boost through an initiative announced by Stephen Hawking. Considering the number of celestial bodies throughout the universe with conditions similar to those on our planet it is far from improbable that life—and even intelligent life—could be found elsewhere. It is equally likely, then, that also evidence of extinct life may be found. Extinction of life may be the consequence of external circumstances, such as the impact of an asteroid. It could also be the consequence of how living organisms undermine the conditions necessary for their

survival. We see this currently happening on planet Earth. Several studies during recent years (I mentioned one at the opening of our Stellenbosch colloquium) have highlighted the possibility of an impending mass extinction. I wonder how an intelligent species will face its own demise at a time when disaster can no longer be avoided. What will it still do? It may be an interesting and revealing exercise if we imagine that such scenario would take place on our own planet and that we are that species.

Question: *What holds us from living in constructive symbiosis with the environment of which we are part?*

Background: There is a tendency to think of ourselves as something special, as not being part of nature. We thus use natural resources without considering that we are—or could be—also ourselves a natural resource to other segments of the biosphere or the natural environment in general, including inorganic nature. Nor do we consider seriously that we co-inhabit planet Earth with other organisms on which we depend. I consider as key purpose of human learning the development of our intelligence to interact constructively with change. We both provoke change in our environment and react to it. That dual process should reflect our symbiotic existence within our environment. However, most of the time it doesn't, particularly not in the so-called developed world. We used to be better at it. So-called primitive peoples are still better at it. Among the peoples I know—and they are many—I find the Dutch setting a good example. They have lived in the Low Countries for thousands of years since ancient tribes migrated to that area. Had they not been aware of the need to live in symbiosis with their otherwise uninhabitable environment, they would long have perished.

Question: *What has gone wrong in the development of democracy? Can it be repaired? How?*

Background: Raising this question was prompted by Federico Mayor's video intervention at our colloquium. I refer to that video, which will be played at the start of the colloquium.

Question: *What has humanity deprived itself of by excluding/restricting women from constructive participation? How could it ever happen? What lessons are to be learned, particularly in regard of tendencies to exclude/restrict other groups from participating?*

Background: This question too was prompted by Federico Mayor's video intervention, to which reference is being made.