

Two things commanding attention

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With this final BtSM colloquium in Brazil I should like to bring the focus of our discussion back to where we started in 1999 at the AERA Symposium on *Overcoming the underdevelopment of learning*, namely the need to broaden and enrich the meaning of learning. In the dominant utilitarian perspective, learning has generally been interpreted as acquisition of knowledge, knowledge being a commodity serving in the first place economic interests.

Because of the above initial focus, work of the Learning Development Institute during the first five years of its existence has focused on researching the Meaning of Learning (MOL) and elucidating what we do not know about learning. The latter area of concern was designated the Book of Problems (BOP). Important traces of MOL and BOP can be found on the learndev.org Web site. A key point of reference for this work was a definition of learning¹ I had developed on the basis of my earlier work, which states that

“Learning is the disposition of human beings, and of the social entities to which they pertain, to engage in continuous dialogue with the human, social, biological and physical environment, so as to generate intelligent behavior to interact constructively with change” (J. Visser, 2001, p. 453).

Note the following points regarding this definition:

- Learning is a disposition, a mood of openmindedness, which expresses itself in a permanent attitude to be open to one’s environment.
- Learning is something not only individuals, but also social entities (a family, professional community, country, Internet based group, etc.), engage in.
- Learning is lifelong, not only in the sense that people may, from time to time, engage in formal learning pursuits, but particularly because one interacts continuously with one’s human, social, biological and physical environment, questioning it, exploring it, and learning from and with it.
- The purpose of learning is to allow us to become better and better at interacting constructively with changes in our environment while being aware that we are often ourselves the originators of such changes.
- This definition contrasts with traditional definitions of learning which focus on learning gains expressed in changed abilities to perform. By contrast, in the above definition the focus is on learning as a process.
- A further difference lies in the fact that traditional definitions are neutral to what one does with the new skills one has acquired. Contrariwise, the new definition recognizes that learning has a direction, it can be positive or negative.

¹ Visser, J. (2001). Integrity, completeness and comprehensiveness of the learning environment: Meeting the basic learning needs of all throughout life . In D. N. Aspin, J. D. Chapman, M. J. Hatton and Y. Sawano (Eds.), *International Handbook of Lifelong Learning* (pp. 447-472). Dordrecht, The Netherlands: Kluwer Academic Publishers.

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My view of what building the scientific mind entails has evolved, and in the process significantly changed, over the past 15 years. I'm not sure if I have reached the end of that evolutionary process. I'm still learning, particularly thanks to discussions I have with other people. Nonetheless, I find the description I currently use helpful in guiding me now that we start working on turning theory into practice. According to that description, building the scientific mind is

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.*

Note that in the above description:

- I avoid using the word 'mind' as it is too easily interpreted in the Cartesian sense of the term. Instead, I have replaced it with the phrase 'way of being in and of the world.' This formulation emphasizes the intimate relationship between us as human beings and the world of which we are an inseparable part.
- I avoid the word 'science' as it is too easily interpreted in terms of its too narrow reference to the body of knowledge pertaining to disciplines such as physics, biology and chemistry. Such narrow interpretation of the word 'science' should probably be attributed to the coining by Whewell in 1833 of the term 'scientist' to designate professionals working in these areas. Consequently, building the scientific mind is then seen as a concern limited to reform in science education and relevant to those who eventually become scientists.
- I refer to mastery of skills not as an autonomous goal of the building of the scientific mind but as an important means in the process of shaping the envisioned 'way of being in and of the world.'
- I also refer to the building of the scientific mind as a continual process, which, just the same as in the case of learning, evolves along the lifespan.

It should not surprise that the above definition of learning and the description of what is involved in the building of the scientific mind are conceptually related.

The scientific mind being such a multidimensional and complex concept, I present below again an overview of the dimensions we identified over the years. Going by my most recent discussions it appears that underlying these different aspects is the notion of determination and passion (passion with issues, not with expected results).

THE SCIENTIFIC MIND: a multidimensional concept

