

Epistemic Literacy or a Clash of Clans?

A capability-based view on the future of learning and education

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In the last five decades there has been a radical change in the ways in which knowledge is stored and shared. Explicit knowledge is now widely available, and collective memory is today stored on the net. Cultural knowledge is rapidly becoming dissociated from space and physical proximity.

The ongoing social experiment is without comparison in the human history. Although new methods of communication enabled social transformation before, such as the emergence of the 19th century public sphere famously analyzed by Habermas,¹ never before has the change been as fast as it is today.

Fifty years ago, three trans-Atlantic submarine cables crossed the ocean floor, and it was possible to make about 250 simultaneous phone calls across the Atlantic. The U.S. and the Soviet Union launched the first commercial communication satellites in April 1965, and the first international direct dial phone call was demonstrated in June 1966 between Philadelphia and Geneva. It was only at the beginning of the 1990s that global communications became effectively possible when optical fibers dropped the cost of communication by three orders of magnitude.

The outcomes have become visible during the last decade: Skype was introduced in 2003, Facebook a year later. Google Maps and YouTube became available in 2005, Spotify in 2008 and Instagram in 2010. The term open educational resources was invented in 2002, and now tens of millions learners use OER.

As the sharing of knowledge and meaning is now increasingly independent of location, shared values are becoming key drivers for social connectivity. Social cohesion is increasingly based on similarity of values, and in the virtual world it is increasingly easy to avoid conflict by sticking with people who share the same values. We are therefore returning to a social organization that resembles the pre-industrial world. But whereas in the pre-industrial world proximity and physical space generated practical constraints for cohesion and collaboration, on the Internet it is easy to excommunicate those who have a different view of the world. The Habermasian public sphere, thus, is splitting into incompatible public spaces, and the political impact is already clearly visible.

In Europe the medieval organization of knowledge lost its dominance because trade linked local systems of production with remote locations. Knowledge became increasingly universal. Natural sciences provided an exemplary case of context-independent knowledge, profoundly shaping beliefs about what knowledge is and how it can be acquired. Universal knowledge enabled mechanical replication both in sciences and in manufacturing, thus facilitating the rapid expansion of the industrial and science-based systems of production. This new mechanistic mode of production created the need for standardized skills and universal education.

The heyday of the industrial model of education was about fifty years ago. It successfully diffused the basic skills of reading, writing and arithmetic to the masses in the industrializing countries, at the same time infusing values necessary for the flourishing of the industrial age. The rapid expansion of manufacturing and white-collar jobs created a constant demand for basic education and made standardized skills and knowledge an important source of social mobility and progress. For over a century, education was a high-speed line from the agrarian society to the modern urban world. Predictable life-paths and consumption patterns and rapidly advancing tools for mass production created a world of constant growth, measured as the quantity of production. In this world, progress was about removing scarcities and addressing basic needs, increasingly generated by the mass media. In this world more was better, novelty was progress, and universal knowledge created the foundation that facilitated growth, jobs, and social cohesion.

Now the universal model of knowledge is contested and the industrial world is in permanent decline. Blue-collar jobs are almost gone, and many white-collar jobs will follow the suit as the global real-time production networks require that humans are replaced by automated routines and computer algorithms wherever this is possible.

Although it is still commonly claimed that universality defines what true knowledge is, a more contextual view on knowing is gaining strength. Science itself is in crisis, as a rapidly growing fraction of research produces results that cannot be replicated. Indeed, it is now understood that the requirement of context-independent knowledge and reproducible experiments leads to a very specific model of nature. This model quite perfectly fits with those things that classical physics used as its prototypical cases; in general, however, it does not produce useful approximations of the world.ⁱⁱ Business firms have also realized the importance of contextual knowledge that makes and breaks industries. As a result, small start-ups and large multinationals now experiment and struggle with a large variety of open, "user-centric," collaborative, and co-production models of innovation and product creation. Digital communication technologies and failures in computer-based and technology-enabled education have made it clear that text and explicit knowledge only make sense in a context. As Michael Polanyi emphasized some fifty years ago,ⁱⁱⁱ explicit knowledge requires a context of tacit knowing that necessarily remains unarticulated.

Today we therefore see an increasingly heterogeneous landscape of knowing. The increasing transparency of communication now makes it visible that different knowledge communities have different and incompatible contexts and systems of meaning. The world of meaning is not flat; it consists of a large variety of heterogeneous and incompatible ontologies. Specialist knowledge is not anymore refinement of more universal knowledge; instead, it is often based on a special worldview and horizon of meaning that are incommensurable with those bodies of knowledge that we assumed to be universal.

In 1996 UNESCO defined the four pillars of learning as "learning to know," "learning to do," "learning to be," and "learning to be together."^{iv} In a heterogeneous world of knowing, the four pillars of learning need to be integrated in a new way.

Learning to know requires a capability to understand how knowledge organizes individual and social lives. Beyond the skills to access existing knowledge, we need an active capacity to create knowledge and make sense of the world.

We could call this skill epistemic literacy. Epistemic literacy helps us cope with heterogeneous and dynamic knowledge landscapes. It means that we understand how knowledge is created and what constitutes the social basis for learning and education. It means that we know what a good argument is, and what counts as evidence. It also means that we understand how and why different worldviews are created and how these lead to epistemic power struggles.

Epistemic literacy is becoming socially and individually important as the Internet is rapidly eroding historically evolved social boundaries, institutions, and systems of meaning. As the world of knowing becomes transparent, the taken-for-granted contexts for knowing disappear and have to be reconstructed so that the world can make sense again. Without epistemic literacy and capability for critical reflection, this construction is driven by dogmas, orthodoxies, and fashions that have sufficient power to generate internally coherent systems of meaning and separate those who are in from those who are out. Without a parallel development of epistemic literacy, the democratic transparency of the Internet, thus, creates a global world of tribes and clans.

"Learning to do" becomes the capability to apply epistemic literacy and critical thinking in productive ways in this diversified world. Learning to do is about applied knowledge but practical application now requires active knowledge creation, exploration and innovation. In the industrial age it was possible to define skills as mirror images of specialized work tasks, largely determined by a broadly shared and slowly changing list of standardized production processes. Today, those work tasks that can be standardized have to be automated, and the number of workers in routine tasks is becoming statistically insignificant. This is perhaps the biggest difference between the passing era of employment-led socio-economic development and the future. The old world of work still exists but mainly in the last shrinking peripheries of the global economy, in high-profile speeches, and in national statistics that only see people using yesterday's categories that create artificial stability and continuity where it does not exist anymore. Today, the motives and objectives of action are in constant flux, and innovation creates things that did not exist before. Learning to do is not anymore about acquisition and internalization of practical knowledge; instead, it is about the ability to create and invent practically relevant knowledge. The world is expanding, and the static and well-defined industrial age skills are being replaced by more generic capabilities that make meaningful and valuable action possible.

Learning creates progress when it expands our capabilities to be and to do things that we have reason to value. As Sen has pointed out,^v our capabilities are rooted in social, cultural, and bodily contexts that are not universal. Development is about expansion of these personal and highly contextual capabilities. Although the debate still goes on about whether some basic universal human capabilities can be defined,^{vi} in practice progress and development are deeply subjective and highly idiosyncratic. In the Senian capability-based approach, this subjective foundation of development is linked to a universal requirement that valuations are reasonable. They cannot be purely subjective preferences or based on hedonistic fulfillment; instead, we need to be able make a coherent argument about valuations that can be accepted as coherent also by those who do not share these values.

Learning to know, learning to do, learning to be, and learning to be together, therefore, are inseparable elements of individual and social development in the future. All living beings

learn, from a simple cell to a circus elephant. For humans, however, learning is social and built on cultural stocks of knowing. Learning creates predictability that is necessary for individual and collective action. It creates a shared context that is necessary to make further knowing and learning possible. Without shared expectations and their implementation in cultures, institutions, norms, and rules, there could be little learning. Somewhat paradoxically, this historically inherited context makes social development and individual progress possible. In a heterogeneous and diversified world, learning leads to development when it is highly contextual, but the various contexts need to be integrated. Without epistemic literacy, the use of already existing technologies of communication and knowledge can rapidly lead to virtual tribes, a new world of warcraft, and the clash of clans.

i Habermas, Jürgen. 1989. *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society*. Cambridge: Polity Press.

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The characteristics of models used in natural sciences have been analyzed in great sophistication and detail by Robert Rosen, influenced by a branch of mathematics known as Category Theory. In particular, Rosen focused on the question on how to model biological and living systems, arguing that living systems cannot be modeled using context-independent models such as those used in physics and, for example, economics. See, e.g., Rosen, Robert. 1985. *Anticipatory Systems: Philosophical, Mathematical and Methodological Foundations*. Oxford: Pergamon Press.
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iv

UNESCO. 1996. *Learning: The Treasure Within*. Paris: UNESCO.

v

Sen, Amartya. 2000. *Development as Freedom*. New York: Anchor Books.
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vi

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