From Smart Cities to Smart Environment: Hints and Suggestions for an Ecology of the Internet

Antonio Cartelli, University of Cassino and Southern Latium, Cassino, Italy

ABSTRACT

After a short introduction on the evolution of ICT influence on mankind and on the meaning and functions of smart cities, the Me.Dig.Eco. project (Eco-Sustainable Digital Mediterranean Sea) is discussed and it is especially showed how it can contribute in the construction of a virtual environment, having the following main features: a) aiming at helping people to have instantaneously at hand any information on the places in that environment and safely navigating from place to place, b) creating a smart and easy communication channel with the population of the coasts and the islands in that sea, to be fully immersed in those communities and living a full immersion experience in those natural environments.

Keywords: Augmented Reality, Natural Environment, Smart City, Smart Environment, Virtual Environment

FROM CONNECTIVE AND COLLECTIVE INTELLIGENCE AND KNOWLEDGE TO SMART CITIES

Different perspectives have marked the analysis of the transformation processes affecting mankind for the presence of digital technologies. They widely influenced and modified educational processes and pedagogical research by making easier and faster communication, but also induced deep changes on students and subjects’ ways of thinking and learning. The viewpoints adopted for the description of the effects of digital technologies on students, and more generally on people, can be summarized as follows:

• First, from the psycho-pedagogical perspective, the use of digital instruments and tools is seen to produce its effects inside different educational paradigms; otherwise stated, pedagogical literature discusses the relevance of the IT/ICT impact on behaviourism, cognitivism and constructivism (both interactive and social), and analyzes

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the different uses and effects of digital instruments, when different educational processes and strategies are adopted;

• Second, from the psycho-social side, McLuhan (1968), De Kerckhove (1996) Lévy (1996), to cite only some among the most famous authors, describe the changes on human thinking and knowledge development operated by IT/ICT. They discuss the modifications induced on mankind by the use of mass media and of the Internet, and hypothesize the development and growth of new kinds of intelligence, like collective and connective intelligences, when people communicate or use digital instruments to get information from the Internet.

More recently a new paradigm has been proposed by Siemens (2005), it is based on the integration of the principles explored by chaos, network, complexity and self-organization theories, to design new ways of interpreting learning and knowledge phenomena. The name for this new paradigm is connectivism.

Following Siemens ideas on connectivism, learning is a process which occurs within nebulous environments of shifting core elements – not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of subjects (within an organization or a database), it is focused on connecting specialized information sets, and the connections that enable us to learn are more important than our current state of knowing.

Connectivism is driven by the understanding that decisions are based on rapidly altering foundations. New information is continually being acquired. The ability to draw distinctions between important and unimportant information is vital. The ability to recognize when new information alters the landscape based on decisions made yesterday is also critical.

Where connectivism differs from other theories, argues Downes (2007), is that connectivism denies that knowledge is propositional. Otherwise stated, the other theories are ‘cognitivist’, in the sense that they depict knowledge and learning as being grounded in language and logic. Connectivism is, by contrast, ‘connectionist’. Knowledge is, in this theory, literally the set of connections formed by actions and experience. It may consist in part of linguistic structures, but it is not essentially based in linguistic structures, and the properties and constraints of linguistic structures are not the properties and constraints of connectivism.

As regards teaching experiences based on connectivism there are a few examples to refer to, if all the constraints of the founders of the theory are applied. Downes (2007) states in fact that: “to teach is to model and demonstrate, to learn is to practice and reflect”. On these bases the foundations of connectivism can be found in the teaching experiences of J. S. Brown, who worked with technicians and researchers on training and updating courses; the main concepts emerging from his work are: 1) the construction of knowledge assets, which make effective learning in a community of practice, 2) the web as a medium for an ecology of learning, where everyone can be producer and consumer of information and knowledge and 3) the construction of a regional learning repository, where a social knowledge is built and made available (Brown, 2000).

It is very difficult to state how much the theories concerning knowledge construction and development inside corporate and organizations, both in the whole structures and in the subjects belonging to them, influenced the ideas of connectivism. For sure, digital technologies cannot be considered responsible for the changes affecting organizational knowledge, because the interaction between individual and organizational knowledge has been detected and studied before IT/ICT spreading and growing up.

Furthermore, it is difficult to say whether the above topics and the development of suitable digital instruments and strategies, like embedded computing, augmented reality and clouding computing contributed in the development of the ideas on the construction of special learning environments and, of course, of smart cities. It has to be remarked here that in current definition of smart cities urban performance depends not only on the city’s endowment of...
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