

# Chapter 1

## Education Ecosystems in the Anthropocene Period: Learning and Communication

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### ABSTRACT

*Learning and communication received much attention in applied learning theory since it provides instructional designers with opportunity to plan and innovative learning environments and spaces. However, not only do many teachers find learning and communication demanding, it also remains unclear what they should do to foster learning and communication in teaching and self-directed learning activities. This chapter investigates the issue of learning and communication from the perspective of ecology science and phenomenology. The first objective aims to identify new drives and ecological events within behavioral and cognitive processes. The second objective is to describe the concept of education ecosystem, its structure, and functions. Results show that important drives of ecological ecosystems are information overload, extra time of working on computer, old classroom settings, and the old content of textbooks. This leads to importance of the practical application of the cognitive and organisational ergonomics norms in learning design. In addition, is important to remark that the behavior of drives, influenced by personalized events, marks the capacity of learning and communication of each individual.*

### INTRODUCTION

We are living in the period of deep Anthropocene when human activities influence not only the climate and environment but also natural mechanism of learning and communication. Humanity is at crossroads: industry and economics are in the forefront of a new industrial revolution. 8.4 billion of the digital screens that suddenly connect 7.6 billion of the global population. Economy does not create enough jobs. There are “people and ecosystems, spatial scale shifts, cross-disciplinary linkages, and temporal scale shifts”(Carpenter & Turner, 2017). More and more people virtually connect to, collaborate with, communicate and learn in/from various geographical areas, from any spaces and at different levels.

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Conceptually, any ecosystem is not the sum of systems. An ecosystem can be called “meta-system” because matter, energy, information are the core elements of all biotic/abiotic factors and components.

There are some core definitions of ecosystem. In Oxford English Dictionary an ecosystem is defined as “a complex network or interconnecting system”. Nevertheless, what means an interconnecting system?

1. Ecosystem is “a natural functional ecological unit comprising of living organisms (biotic community) and their non-living (abiotic or physio chemical) environment that interact to form a stable self-supporting system” (Mondal, 2018). The school system, a learning management system, and other systems are examples of education ecosystem established by humans.
2. Ecosystem is “a category of physical systems of the universe, which range from the universe as a whole down to the atom” (Tansley, 1935, p. 299). In this perspective, actions and behavior are controlled both by *external* (i.e. Moon, Sun, climate, soil, food, etc.) and *internal* (e.g. emotions, soil, motivation, etc.) factors. Thus, only co-existing together, the external factors and the internal factors ensure the sustainable development.

On the one hand, the integration of Information and Operation Technologies with various educational and knowledge management systems leads to Pervasive Computing, and, therefore, to greater speed and intelligence of machine-to-machine communication and improvement of human-machine communication. On the other hand, Internet, sensors, and embedded systems multiply power the way of intelligent combinations between mental, physical and mechanical. What is the solution? In our point of view theory of applied learning need to be focused on communication with nature.

The biological-ecological thought regarding correlation between communication with nature could be derivatives from the works of Hippocrates and Aristotle. The Mother Nature is the leading theme of them. Moreover, from ancient conceptualizations, it is known also the term “ecosystems”. As was noted by Berkes, Kislalioglu, Folke, and Gadgil (1998, p. 409) there are two characteristics of ecosystems:

- The unit of nature is often define in terms of a geographical boundaries;
- Abiotic components and humans are considered to be interlinked.

“The ecosystem, or ecological system, is considered to be a unit of biological organisation made up of all of the organisms in a given area (that is “community”) interacting with environment” so that a flow of energy leads to characteristic tropic structure and material cycles with the system (Odum, 1966).

In an ecosystem, each organisms has its own niche. The system’s order reside in its heterogeneity. All these ideas were described in the book of Margalef (1968). One year later, in the book review Deevey (1969, p.313) emphasizes the fact that the irreducible unit of ecology is not a population, but a population-in-environment, that is, actually, an ecosystem. This is the line for investigation of “deep ecology” that is a baseline for the “ecological philosophy of education” (Trainer, 1990) – a movement that allows emphasizing that “daily life” has the character of gestalts rather than separate facts. Whatever we do, we are in a unitary situation that is extremely complex. But you are never in a merely factually describable situation. You are always in a value situation, somehow” (Næss and Jickling, 2000, p. 53).

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