Chapter 5
Capturing Definitions for a Sustainable Distance Education Ecosystem through an Online Delphi Study

M. Banu Gundogan
Middle East Technical University, Turkey

Gulsun Eby
Anadolu University, Turkey

T. Volkan Yuzer
Anadolu University, Turkey

ABSTRACT

In broadest terms, ecology is the scientific study of interactions among organisms and their environment, and ecosystem defines a community of living organisms in conjunction with the nonliving components of their environment interacting as a system. At present, both terms are references of many studies including education; various authors and studies investigating distance education with an ecological perspective refer to the ecosystem concept as frameworks for defining the operational components and processes. Among all these contributions, the concept of “waste,” one of the key concerns of sustainability, seems to be vaguely discussed. Having this as a standpoint, an online Delphi study was carried out in a research project at Anadolu University, Turkey, aiming to define a sustainable distance education ecosystem including the explanation of “waste” with reference to ecosystem definitions. The study was processed online and is explained by both presenting the results and discussing the benefits and also difficulties encountered.

INTRODUCTION

Within an ecological perspective, the ecosystem concept has been associated with education and learning by various authors (Brown, 2000; Richardson, 2002; Jones, 2008). Matching the ecosystem definition which states that the living community and the nonliving environment function together as an ecological system or ecosystem (Odum & Barret, 2005), a learning ecosystem is described as “a collection of overlapping communities of interest (virtual), cross-
pollinating with each other, constantly evolving, and largely self-organizing” (Brown, 2000). In a learning ecosystem formal, social, informal and traditional learning intersect and learning “just happens” (Jones, 2008) providing the presence of diverse learning options (Brown, 2000). A learning ecosystem matrix with reference to studying, teaching, projects and exercises quadrants based on instruction delivery and navigation control is also presented (Richardson, 2002). In terms of distance education, the concept of ecology and ecosystems are referred as frameworks for defining the operational components and processes (Zachry, 2000; McCalla, 2004; Frieb, 2004; Chang & Guet, 2007; Uden & Damiani, 2007; Dong, 2009; Pata, 2011; Reyna, 2011; Nasr, 2011; Johnson, 2012). These frameworks can be grouped as follows:

1. **The Learning Ecosystem**: Encompassing up-to-date information and content,
2. **The Teaching Ecosystem**: Encompassing complex interactions between the learner, interface, instructor and content,
3. **The Digital Ecosystem**: Focusing on the rapid growth in digital technology,
4. **The Learning Environment Ecosystem**: Covering content providers, consultants and infrastructure. Moreover, the future of distance education is mentioned to be feasible only if these ecosystems are well understood and analyzed (Dillon & Hallett, 2001) and the need for developing models that support the development and sustainability of these ecosystems are underlined (Uden & Damiani, 2007; Issa, Issa & Chang 2011).

A sustainable ecosystem is a biological environment that is able to flourish and support itself without outside influence or assistance. In ideal sustainable ecosystems, everything for the life to survive is already provided and no waste is generated. To ‘sustain’ is not only about keeping up, supporting or maintaining continuity but also is about nourishing, cultivation and acknowledgement (Uden & Damiani, 2007). 21st century incentives in all fields of human endeavor have replaced sustainability measures in their plans and actions as a necessity for meeting the needs of the present and future generations. Within this framework, ‘Green Engineering’ and ‘Green Design’ perspectives and ‘Life Cycle Assessment’ procedures introduce valuable methodologies. ‘Green Engineering’ is the design, discovery, and implementation of engineering solutions for sustainability (Anastas & Zimmerman, 2006) and ‘Green Design’ is intended to develop more environmentally benign products and processes (Hendrickson, 1999). Life Cycle Assessment, a systematic analysis of the environmental effects of a new product or process, is common to both green design and engineering perspectives. This necessitates defining a system boundary, carrying out an inventory of all the materials and energy used and assessing all the environmental discharges resulting from the product’s manufacture, use, and disposal within the defined boundary. Regarding the disposal process, the design choices on recycle, reuse or beneficial disposition becomes important. Within this framework, after completing its intended usage the product or process could be an input in; a closed-loop, which refers to the re-use of the product or service for the same function and an open loop, which refers to the re-use of the product or service in a different function, typically with lower quality requirements (Hendrickson, 1999).

Distance education is also a process designed to serve actual human beings and alike every design, the process has inputs, outputs and unfortunately, produces waste. Unless managed properly, waste is harmful; to avoid possible harms and to be able to respond both to current and future demands and expectations, distance education has to include ecological and sustainable perspectives to its vision. In literature regarding distance education ecosystems, ‘waste’ is a concept which has not yet been adequately discussed. Believing this being