Chapter 16
Learning in an Active, Collaborative Space

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ABSTRACT

Based on the implications of technological progress and socioconstructivist learning theory, trends are being developed for tools to promote learning in the information society of the 21st century. The future promises a massive increase in information and its ubiquitous availability, along with an increase in computer-mediated communication. It is particularly important to understand that the communication requests placed on the individual and the range of available communication channels will increase in coming years. Tools must therefore be conceptualized to manage the communication and information glut of the future in an "intelligent" way permitting a collaborative way of learning. Looking ahead, lifelong, rather informal and problem-based learning could become significantly more important than formal learning. The characteristics of wikis will be presented as a possible representative example and explored based on the above criteria. The chapter concludes with prognoses on the nature of ICT-supported learning in coming years.

The current search for new educational funnels must be reversed into the search for their institutional inverse: educational webs which heighten the opportunity for each one to transform each moment of his living into one of learning, sharing, and caring. (Illich, 1970, p. 2)

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1. INTRODUCTION

In this section a number of prognoses are presented concerning the future characteristics of ICT-supported learning tools based on current trends towards an information society. The discussion will address technological developments as well as their technological and social consequences while also the exploring the competences required for living in an information society. After describing

a possible conception of learning and showing a didactic method that can be derived from it, some characteristics that learning tools may possess in the future will be inferred.

This section attempts to extrapolate these characteristics to their logical limits. Despite this fundamental approach, certain important aspects of living and learning in the 21st century will not be explored in depth. The discussion will not be extended, for example, to the consequences of globalization and dwindling natural resources, nor to the challenges posed by these developments (e.g., living and working in multicultural societies; sustainable development).

Figure 1 provides a structured overview of the considerations in this section in the form of a concept map (Novak, Gowin 1985). An enlarged version of the presented map can be found at the following url: http://beat.doebe.li/publications/liaacs/. The elements of the map discussed in the individual subsections are displayed in enlarged resolution. An introductory caveat is appropriate at this juncture: Although the concept map – which graphically displays the key aspects of each section – may convey a picture of reality that is highly deterministic, the authors do not endorse this conception. Reality is extremely complex, and eludes accurate schematization in a concept map. This form of presentation is useful, however, and has been selected in order to shed light on key developments and interrelationships.

In addition, as the goal of this section is to infer the future characteristics of learning tools, no attempt has been made incorporate reciprocal effects and feedback mechanisms between the displayed concepts, despite the fact that such mechanisms and effects do surely exist. Please try to keep in mind the concept map presented as figure 1 while reading the whole section. The map figures as leitmotiv, all terms, descriptions and definitions mentioned in the subsections refer to elements and connections of the map. Even if parts of the map are shown in the related subsections the 'whole picture' is crucial to understand the presented ideas.

2. HOW ICT CHANGES EDUCATION GOALS AND EDUCATIONAL TOOLS

2.1 Moore's Law

In 1965, Gordon Moore, a co-founder of Intel, the world's largest manufacturer of semiconductors, predicted in the magazine Electronics that, in coming years, it would be possible to double the number of transistors in an integrated circuit every year (Moore 1965). Moore pointed out that, on average, transistor counts had doubled every year in previous years and that the laws of physics did not prevent this trend from continuing unabated (Figure 2). While the amount of time required to double the density of transistors on a microchip has increased over past decades (up to about 18 months), Moore's law has remained valid to this day. According to experts, computing power will continue to grow at a nearly exponential rate until about 2020, when physical and economic limitations will be reached.

2.2 Technological Consequences of Moore's Law

With the increasing availability of computing power for the storage, processing, and transmission of digital data, information and communication technology (ICT) is playing an ever-more prominent role in our lives. Data are available in digital format everywhere and can be processed automatically.

The universal coding of data in binary format is leading to the convergence of previously distinct tools and media (Negroponte 1995): the computer, for example, combines the typewriter, adding machine, and file cabinet in one device, while the internet unites the traditional media of the