

The Agile and Virtual University

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INTRODUCTION

The convergence of information technology developments, together with instructional and pedagogical developments, is creating opportunities for new paradigms of learning and teaching. New concepts of postgraduated university education and of university continuing education will emerge, where new roles for individuals and institutions will be available and where new requirements will shrink.

The advanced information and communication technologies, together with several applications, offer new perspectives such as the so-called *virtual university*. Simultaneously, to gain market share, several organizational arrangements are emerging in the virtual university field like consortia arrangements and joint venture initiatives between and among institutions and organizations. The dynamically changing social and economical environment where we live aims for new approaches to virtual and flexible university continuing and postgraduated education such as the concept of *Agile/Virtual University* (A/VU) proposed by the authors in this article. However, the implementation of this concept (and of other similar concepts) requires, besides the information and communication infrastructure, the value added provided by higher level functions to support *flexible* and *individualized learning projects*. The implementation of the *Agile/Virtual University* concept requires a framework and a specific supporting environment such as the market of teaching resources.

In this contribution, the Agile/Virtual University concept is introduced as an integrated set of providers of units of learning, that is, integrated to respond to an individualized need. The product provided by the A/VU is an *individualized learning project* (a continuing train-

ing/education course). These providers can be universities, university teachers, and individuals (independent teachers), organized and managed by either a higher-education enterprise or a university itself, in a specific environment proposed by the authors as a *market of teaching resources* and also herein presented.

BACKGROUND AND MAIN CONCEPTS

Web-based distance education seems to be a contribution towards the democratization of learning access, in particular in the domain we are concerned with—the university continuing education and postgraduated education in the format of an Agile/Virtual University. However, the new approaches to learning, such as flexible and distance learning, have not yet reached the required stage of maturity and although some of these concepts have existed for several years, there is not yet a clear understanding of the way these approaches will evolve and become useful and common practices.

Another concern is that systems conceived to provide integrated standard off-the-shelf learning solutions are less efficient when compared with dedicated systems. Providers of units of learning, primitive or complex, can be integrated in completely individualized or customized flexible Web-based networked learning projects, which in turn can be agilely and dynamically adjusted to either the performance of the providers or to the learner evolution or changing requirements. This corresponds to a new structure of learning, that is, a different learning project for each individual (learner) while, at the same time, each provider (teacher) can specialize in focused units of learning and get economies of scope by providing with high quality the same units in several different learning projects. This concept requires

an environment to cope with several concerns such as assessment, accreditation, quality assurance, trust, and the market of teaching resources, and must be mediated by a broker (Cunha & Putnik, in press).

THE E-LEARNING OBJECTS CONCEPT

Several different definitions of *e-learning objects* can be found in the literature, and other terms are used seemingly interchangeably in place of *e-learning objects*. In this article, Wiley's (2000) definition is adopted: a learning object is a "reusable digital resource to support technology-supported learning" (Wiley, 2000).

The Virtual University Concept: State of the Art

According to a Commonwealth of Learning evaluation report on virtual education (Farrell, 1999), the label virtual is widely and indiscriminately used, and it is frequently used interchangeably with other labels such as open and distance learning, distributed learning, networked learning, Web-based learning, and computer learning.

To gain market share in the lifelong learning market, several organizational arrangements are emerging in university virtual learning and are the result of partnerships between institutions or businesses and institutions, joint venture initiatives between and among institutions and organizations, consortia arrangements, and so forth, that can be found in, for instance, Dirr (2001), Farrell (1999), and American Federation of Teachers (2001). Simultaneously, complementary institutions that do not provide instruction directly emerge in the virtual university field; examples include institutions authorized to provide services as quality assurance, award credentials, learning assessment, learning records, and broker-type organizations designed to broker programs from individuals and institutional providers.

The definition proposed by the Commonwealth of Learning for the concept of virtual education institution (Farrell, 2001) consists of an institution involved as a provider of learning opportunities to students, using information and communication technology to deliver its programs and courses and provide tuition support and is the result of alliances/partnerships to facilitate teaching and learning to occur without itself being involved as a direct provider of instruction. We accept

this definition and use it as a basis to the proposal of the new concept of Agile/Virtual University.

There are a few examples of virtual educational institutions, namely, of virtual universities, but we still can say that most of the developments towards virtual universities are experimental and many times still do not address the needs of their potential clients. Further, they do not correspond to the dynamics and agile requirements of virtual universities, those of individualized learning projects.

The market for agile and virtual university learning is being fragmented (as the markets for all sorts of goods and services) with learners each time more demanding and specialized. This market is becoming more and more competitive with global providers acting through strategic partnerships.

Brokerage for Educational Systems: State of the Art

Efficient searching and selection of educational content is a key feature of distributed Web-based educational systems. Traditional technology could be used to search the Web for educational content; however, it is easy to conclude that these do not cope with our requirements.

The role of third party intermediaries, linking different parts of a value chain, has been covered extensively by researchers in economics and business, and the question seems to be whether the future will hold a place for intermediaries, given that new technologies facilitate direct links between market players such as manufacturers and end consumers of products or businesses and their suppliers.

In the e-learning environment, brokerage will support the match between offer and demand of learning objects, as demonstrated by several projects such as:

- The GESTALT project that proposes a brokerage service for educational resources, named resource discovery service within a pool of registered providers of educational contents (GESTALT, 2003).
- The proposal of Anido, Rodríguez, Caeiro, and Santos (2003) for a Domain CORBA facility for educational brokerage that defines the software services needed in an intermediation framework for learning objects, using the OMG's¹ *interface definition language* (IDL).

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