

## Chapter 13

# Employing Fuzzy Logic for a Real-Time Comprehensive Quality Assessment Model of Service Providers in E-Learning Environments

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### ABSTRACT

*Assessing quality is obviously a key concern in many aspects of learning, education and training, so why should it be especially crucial in relation to e-learning? The e-learners, as with other distance learners, are working in isolation with limited or sometimes non-existent human support. This means that the first impact of any failure in the providers' quality assessment regime falls directly on the e-learner. When an e-learner encounters errors caused by a failure in a providers' quality assessment regime the impact might be immediately evident or not become evident until the learner undertakes an assessed outcome. Since e-learning development is fundamentally a team-based activity, the effectiveness or quality of an e-learning program depends on the weakest link in the production chain. E-learning exists at a point of convergence between technology based disciplines and human-centered disciplines.*

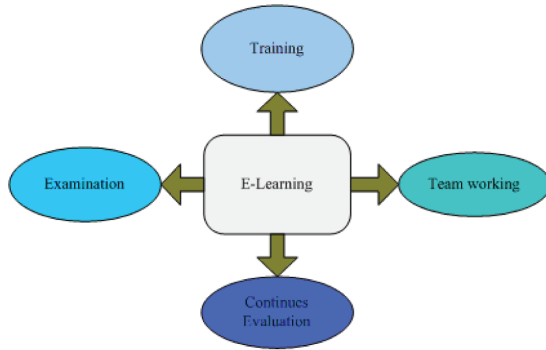
### ORGANIZATION BACKGROUND

Mazandaran University of Science and Technology (MUST), situated in the city of Babol in the Province of Mazandaran (North of Iran) 15 km away from Caspian Sea, was founded in 1992. Blessed with a temperate climate, a plethora of colorful blossoms and removed from the turmoil and upheaval as-

sociated with big cities, Babol provides a suitable environment for academic activities. In recent years, MUST has scaled such enviable heights to become a conglomeration of different provinces and cultures. This university provides different fields of studies in and various programs. Industrial Engineering, Computer Engineering, Information Technology Engineering, Civil Engineering, and MBA are the programs offered by MUST.

DOI: 10.4018/978-1-61520-751-0.ch013

*Figure 1. E-learning supports all aspects of education*



Design of complex educational systems, involves multiple disciplines and hence a diverse assembly of engineers and facilities that are not necessarily placed at the same geographical location. Furthermore, there has been a clear interest in the industry in harmonizing technological expertise amongst various societies, which further facilitates outsourcing resources. Consequently, the notion of global virtual design teams, as a disseminated collection of people and resources that are integrated through geographical, cultural and functional borders, should be applied. A multifaceted curriculum aims at training students who can work at multinational corporations in teams composed of a wide range of expertise and technical. Therefore, the formation of interdisciplinary, inter-university engineering programs that has changed course from wishful thinking to serious planning, usually labeled as e-learning.

An e-learning solution for designing pedagogy must therefore bridge the gap between the physical and virtual worlds with a comprehensive framework based on modular components, which provides students with remote access to software and hardware resources, and establishes a virtual collaborative community. A configuration of e-learning is represented in Figure 1.

## SETTING THE STAGE

Recently, an e-learning research center has been founded to investigate different aspects of optimization in e-learning environment. One of the objectives of this center is to analyze different aspects of quality in e-learning. As regards what respondents understand by quality in e-learning, the predominant view is that quality relates to obtaining the best learning achievements. Together with ‘something that is excellent in performance, this primarily pedagogical understanding was more widespread than options related to best value for money or marketing.

The issue of quality in e-learning is both topical and widely discussed. On the one hand, it provides material for political debate at national and European level, and on the other, it leaves those involved in e-learning scratching their heads. How can quality be best developed? And, even more important, what is in fact the right kind of quality? At first there was an attempt to find one concept that would be right for all, but we have now become more cautious. Various types of analytical description now head the list. These are intended to ascertain and describe how quality development functions in different sectors of education and in different countries.

The European Quality Observatory is one such observation platform for quality development in European e-learning. However, there is more to it than ‘pure’ data collection and description. A key aim is to analyze what actually makes successful approaches successful. In a way, the aim is to find a quality concept for quality concepts. Decision-making and implementation strategies also need to be designed. One thing is clear today: the main problem is not finding a quality approach, rather choosing the right one from among the huge number of quality strategies available.

One of the main purposes of this study on e-learning is to achieve the following objectives:

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