

# Online course in ergonomics: an exploratory study in Venezuela

**Maria TORO-TROCONIS**

*Luleå University of Technology, Division of Industrial Ergonomics*

*SE-971 87, Sweden Tel. + 46 920914 73 Fax. +46 920 915 02*

*mett@arb.luth.se*

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## **Abstract**

This paper discusses the development of an online course in ergonomics for a postgraduate programme in Technology Management in Venezuela. An exploratory study found that learners' performance on the course was influenced by different synchronous and asynchronous communication mechanisms. The importance of promoting learners/facilitators interaction, and incorporating generic network tools into online learning management systems, is discussed.

*Keywords:* e-learning, on-line learning, internet, ergonomics, industrial developing countries, IDC

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## **1. Introduction**

There are a large number of institutions of higher education who, with increasing frequency, are turning to the use of the Internet to deliver courses to students at a distance, as well as to enhance educational programmes that are delivered on campus (Palloff et al., 1999).

Latin America has not escaped from this reality. There was a sudden interest in the potential of Distance Learning as a method of instruction during the early 1970s in these countries. This resulted in the establishment of two Open Universities: the Universidad Nacional Abierta (UNA) in Venezuela in 1977 and the Universidad Nacional de Educación a Distancia in Costa Rica (Central America). In addition, another model emerged: the first dual-mode (dual-mode: a combination of teaching on campus and at a distance (Rodrigues, 1999) teaching institution known in Latin America: the Mexican ‘Open University System’ included within the traditional ‘Universidad Autónoma de México’ (Rodríguez, 1999).

The Venezuelan experience in Distance Learning is an interesting one on account of its origins. It presents a rich variety of ‘*distance studies*’. Although it started with a traditional Open University, it has evolved to a small-scale combination of initiatives offering a range of both traditional and distance programmes (Rodríguez, 1999).

In 1997, Universidad Nueva Esparta (UNE), a private university in Venezuela, initiated a new distance programme called ‘Postgrados Virtuales’ (PV, or ‘Virtual Postgraduate degrees’ translated literally from Spanish). This offers technology management at both, master’s degree and diploma levels, and the programme is delivered entirely through the Internet. Indeed, a number of videoconferences are offered for all its courses, and tutorial and counselling support are also offered through the Course Online Learning Management System (COLMS), email and fax.

## **2. Ergonomics web-based instruction**

Several initiatives on the incorporation of Ergonomics into the curricula of the PV took place at UNE. These initiatives were promoted by the author of this piece of work, who proposed an introductory course on Ergonomics for the Master’s and Diploma in Technology Management (See Figure 1). The course was introduced as an option in those

programmes in 1999. The demand for this course can be compared to the demand for compulsory ones.

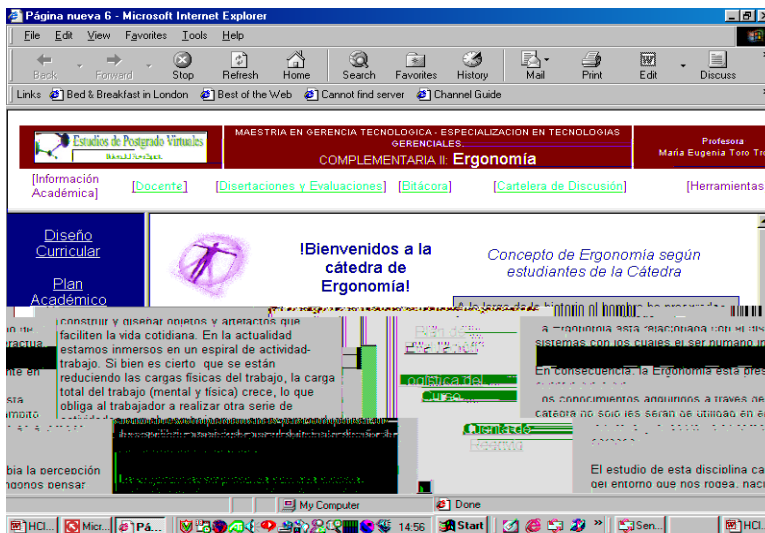


Figure 1. Introduction to Ergonomics Course (UNE) – Frontpage

## 2.1 Online Learning Mechanisms

Internet courses at UNE rely mainly on asynchronous (asynchronous means literally ‘not at the same time’, without live interaction with others. For example, email (Kruse & Keil, 2000)) communication mechanisms. The COLMS used on each course is a FTP-based ‘in-house’ system. It is currently used mainly for delivering of text-based course related materials, such as course handbook and resources. On-line discussion relies on a mailbase system; however tutors and facilitators have the discretionality of adding other synchronous (synchronous means literally ‘real-time’ or live events. For example: chat sessions (Horton, 2000)) and asynchronous features to the COLMS.

## 2.2 Introduction to Ergonomics Course

The difference between lecture-based learning and online learning is that the latter is based upon an interactive, group knowledge building process (Harasim, 1999). As a result, it was realised that other communication mechanisms ought to be taken into account in the learning model to encourage learners’ participation in this course.

Other synchronous and asynchronous communication mechanisms were introduced into the COLMS of the Introduction to Ergonomics Course, to two different groups of learners at different times.

### **3. Method**

Fourteen learners from each semester were asked to participate in a study to evaluate the communication mechanisms of the course. The average age was of 33 (ranging between 25-55). One group was exposed to an asynchronous communication mechanism: a Web-based Bulletin Board facility during one semester. The other group was exposed to a synchronous communication mechanism: a Web-conferencing facility, Microsoft Netmeeting 3.01.

The content of both courses was the same; however, some of the class materials were intended to be discussed by the respective communication mechanisms.

At the end of the course, participants completed a two-part questionnaire that sought for feedback on the adequacy of the communication mechanisms, and their general experience with the Internet.

### **4. Results**

Learners exposed to the web-conferencing system reported that they did not find this facility encouraging for course information exchange and communication. They argued that broadband limitations and different geographical-zone times were the main constraints.

Learners exposed to the Web-based Bulletin Board facility, reported that they found this facility of great help for course information exchange and communication. It was agreed that this facility gave them time to research and reflect on the course topics discussed.

In relation to their Internet experience, all of them had over a year's experience using the Internet and 85% of them spent at least two hours or more browsing the Internet weekly.

Learners' performance on the course was evaluated with a maximum score of nineteen out of twenty. Final grades obtained from the two groups, found significant difference ( $p < 0.05$ ) between the web-based learning approach using a web-conferencing communication mechanism and a Bulletin Board. (Please note that the power of the tests may suffer due to the small sample size).

## 5. Discussion

The purpose of this poster has been to discuss the online learning experience in the area of Ergonomics at a dual-mode university in Venezuela. The online learning/teaching experience was explained through the use of different synchronous and asynchronous communication mechanisms.

Although the main intention of this poster is not to measure learning effectiveness through the use of different communication mechanisms (the effectiveness of synchronous and asynchronous communication mechanisms has already been researched. For example, significant findings show the reluctance to use bulletin board discussion formats in a research carried out at Loughborough University (Crook, 1997)) in the delivery of a course in Ergonomics, it is important to realise that effective online learning programmes should not only be based on the provision of HTML course content.

In contrast, collaborative learning principles should be put into practice focused on an interactive, group knowledge building process to ensure that learners and tutors interact (Harasim, 1999).

It is of great importance to realise the advantage of online learning systems. Preliminary findings do suggest a difference in the way participants learn when using the Internet. Participants exhibit a greater proportion of conscious recollection of learned material than those who learn using traditional methods and it is suggested that these findings are wholly consonant with the dynamic and interactive teaching process that the Internet provides (Anderson et al., 1999).

Viewed together, the findings reported here stress the need to recognise that learning online should rely on communication mechanisms that enhance the interactive process and should be monitored by facilitators and tutors to ensure learners stay motivated.

In addition, it should also be realised that online learning management systems should incorporate the use of synchronous and asynchronous communication mechanisms to provide an easy to use and clear interface.

Generic network tools –such as email, computer conferencing, and newsgroups – impose significant user overhead since they were not specifically designed to support educational activities. Not incorporating models or tools to shape the virtual learning environment involves substantial challenges and costs (Harasim, 1999).

While this single exploratory study does not provide the solution to these issues, it does raise other issues with which online learning organisations, online learning management systems developers and designers, and other professionals in this field, must contend as we advance into the 21<sup>st</sup> century.

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