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ScienceDirect
Renewable Energy 31 (2006) 2447–2459
RENEWABLE ENERGY
www.elsevier.com/locate/renene

A distant-learning training module on the environmental design of urban buildings

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Received 2 July 2005; accepted 18 November 2005
Available online 19 January 2006

Abstract

The present paper aims to present a distant-learning training module that concerns the environmental design of urban buildings. The whole approach attempts to integrate topics that concern the design of urban buildings from various points of views, e.g. active and passive systems, automation systems, indoor air quality, economic aspects, energy and resources management. The package offers both printed and electronic material that gives the possibility to the students to study the various topics by using different educational methods. Additionally, the present package contains software tools that permit the students to examine real or hypothetical situations and to study further the influence of various parameters that concern the environmental building design.

Keywords: Distant learning; Training; Urban environment; Urban buildings; Energy efficiency; Environmental design

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doi:10.1016/j.renene.2005.11.011

1. Introduction

The main objective of the present work concerns the production of a complete educational module using various media technologies and facilitating the distant-learning educational approach. The module is addressed to building professionals and covers the basic training on energy-efficient integrated design of new and refurbished buildings in urban environments. The educational module was developed by accomplishing the following targets [1].

Initially, the necessary material was collected and evaluated. During this first step, the material included existing technical data, scientific knowledge, industrial developments, climatic information, regulatory standards, as well as, the more recent research developments on the characteristics of the urban environments and urban buildings.

After this process, the collected material was developed into a distant-learning educational package, according to the European and international standards that concern this specific educational approach.

The developed distant-learning module aims to make available to building designers, engineers and operators all the necessary information and tools on the appropriate design, evaluation, selection and implementation of energy efficiency techniques in urban buildings.

In addition, the whole structure of the module promotes the adaptation of energy conservation techniques, solar energy, high-efficiency energy systems, improved and adapted thermal and visual comfort standards and appropriate indoor environment quality, through a flexible, interactive and on-going training process.

Moreover, this specific educational module informs the building professionals on the impact of the building, as an energy system, to the urban environment as well as on the impact of the urban environment to the quality and efficiency of the buildings.

Finally, the present work offers the information to assess the real potential for energy conservation of the various existing conservation techniques as applied to urban environments as well as the associated limitations and restrictions and thus to assist designers and building professionals to define appropriately energy conservation priorities.

2. Structure of the educational module

The distant-learning training package consists of both printed and electronic media. This package consists of a course based on printed material (books, brochures, exercises, etc.) and electronic tools (didactic software, multimedia, evaluation tools) that can used by the students/trainees at their location (home or work) under a specific and well-defined work program and timetable, combined with interactive communication between instructors and trainees. The package contains specific, compulsory and elective assignments for the trainees (exercises, dissertations, examinations) which should be undertaken periodically under a well-defined plan and forwarded to the instructors for reviewing, so that the course is judged as successful for the participants and lead to the award of certification.

The material included in the training module, includes information structured as presented as follows [1,2]:

- A printed handbook, which is the principal tool for this educational process. The handbook also includes exercises and tests.