A Multilingual Virtual Environment for Shoe Design Training

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Abstract

The objective of this paper is to present a virtual environment developed for shoe design training in English, Romanian, Turkish and Greek. http://www. vtcforshoedesign.com is a virtual training tool as a product of LdV projects under LLP program. The virtual training centre is a good example of the development of innovative practices in the field of vocational education and training, which is One of Leonardo da Vinci General Objectives. The virtual training tool aims to improve the Quality of VET systems and practices by contributing to "Learning to learn", which is one of Lisbon Key Competences. The paper displays how the developed content has been transferred to the virtual environment with visual aids. The paper focuses on the multilingual aspect of the modules within the virtual environment.

Key words: *Virtual Environment, Shoe Design, Virtual Training*

1. Introduction

Virtual reality can be defined as a technology allowing a user to interact with a computer-based environment which may consist of a simulation of the real world or an imaginary world. Many of such virtual environments are based on audio and visual experiences reflected on computer screens. These environments can have additional properties with simulations. These simulated environments can be very similar to the real world. Myron Krueger used "artificial reality" as term in the 1970s, but the origin of the term "virtual reality" can be traced back to the French playwright, poet, actor and director Antonin Artaud. Artaud described theatre as "la réalite virtuelle", a virtual reality "in which characters, objects, and images take on the phantasmagorical force of alchemy's visionary internal dramas" [1]. The earliest use cited by the Oxford English Dictionary is in a 1987 article entitled "Virtual reality" [2]. Michael Heim [3] identifies seven different concepts of Virtual Reality: simulation, interaction, artificiality, immersion, tele-presence, full-body immersion, and network communication. To Heim, virtual reality already exists and he deigns to communicate to us via the dead tree medium of books. So strap on your virtual eye phones and open the covers and prepare yourself for a roller coaster ride through the labyrinths of hypertext and cyberspace. Heim also identifies the main points that distinguish our external reality from virtual reality? His answer is 1) *natality* (we are born), 2) *mortality* (we die), and 3) *temporality* (we remember past happenings). These limits, he says, "impose existential parameters on reality, providing us with a sense of

rootedness in the earth (a finite planet with fragile ecosystems)." I would agree with him, except I consider the earth to have a robust ecosystem, to be a robust planet, not a fragile one.

2. The Aim of the Paper

This paper aims to introduce VTC-SHOE, Virtual Training Centre for Shoe Design, as a model of multilingual virtual training environment used in vocational education and training. The Virtual Training Centre for Shoe Design is a virtual environment for training for all those with an interest in shoe design field of vocational education and training. Experts in the field can share and exchange knowledge and experience with associates within and outside the European Union through this centre. The project's scientific and pedagogic objectives are in tune with the main priority in Lifelong Learning Programme. Through the various research and development projects, partners have developed training materials for shoe design. These materials have been transformed into the native languages of the partners. This indicates that the innovative e-content, developed within the VTC-Shoe project can easily be translated to various languages too. This virtual training centre formed in this field and its application constitutes the first and good example for virtual learning in national vocational training systems. It helps to improve and upgrade competences and skills of staff and exchange experiences over the virtual training centre. It also increases the work opportunity by helping young generation to use Information Technologies. Virtual Reality is an efficient tool in education and training as education people tend to comprehend images faster than the text lines. Learners can actively participate in the learning process and are attracted by the visual information rather than boring texts. Simulations help them to have the training that would otherwise be too costly. This kind of training is preferred mostly in aviation to train pilots that would be too expensive and dangerous. When we use this training tool in the class rooms, it is certain that it will increase student participation and Classroom activities will use VR tools for hands-on learning, group projects and discussions, field trips, and concept visualization [4].

3. Importance of Virtual Training in Vocational Education and Training

During the 60's and 70's, teaching and learning tools were nothing but a piece of chalk and a blackboard eraser, teachers and students who met each other face to face inside the classroom during class. In the 80's, videotape programs were used as teaching aids. In the 90's, one-way teaching by computer arrived. And finally today's advanced computer and information network technology has revolutionized our teaching and learning methods. In accord with the development, learning environment has also changed. Students can listen to their teacher or trainers in distant classrooms through PCs and get a simultaneous view of their teachers and texts as well. They can ask questions and record the "class" for repeated viewing. Training organizations can conduct professional training directly via the computer network. These learning environments are not so different from a teacher-guided class with discussions and tests as well [5, 6].

In the report "Studies in the Context of the E-learning Initiative: Virtual Models of European Universities", a key concern was how virtual mobility is being supported in European universities through ICT integration and e-learning [7]. The study found that the majority of universities face major challenges in promoting ICT integration. ICT strategy is very important and those universities that have an ICT strategy are significantly ahead in integration of ICT in administration and organisation and networking. Integration of ICT and e-learning is politically important in the EU in terms of internationalisation and globalisation of education, student demand and interest in increasing the quality of education through ICT. At the national level, integration of ICT should become a key priority with national and regional institutions making a commitment to ITC and the development of networks. There must be increased national flexibility with a commitment to support common standards of quality and assessment and to develop national and international metadata standards.

4. VTC-Shoe as a Training Tool

The virtual training centre (http://www.vtcforshoedesign.com) is a portal which has the following sections:
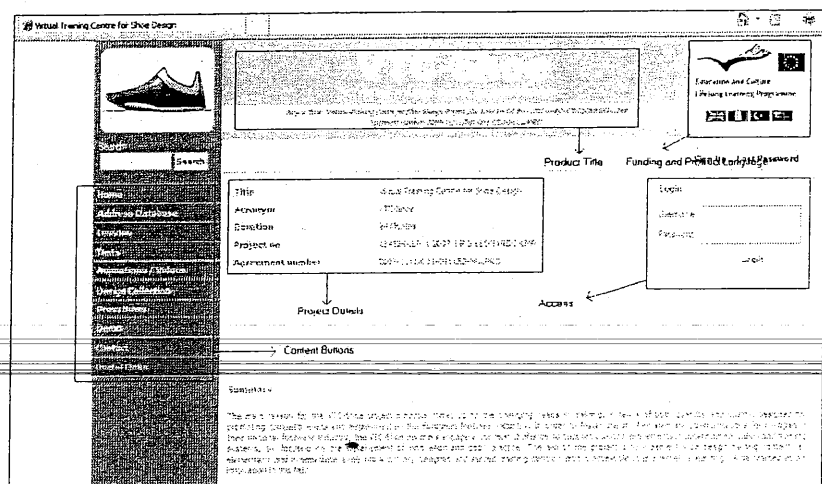
VTC-Shoe is the title of the product, which is the main training tool developed. The product is financed by the Executive Agency (EACEA) in Brussels under LdV Development of Innovation program. The product has been produced in English and then transformed into the native language of each partner. Each flag in this part represents the language version of the tool. The tool is accessible only through membership by getting a user name and password. The buttons of the content are for Address Database, which is the list of the addresses of the footwear related companies in each country. Lessons have been formed according to the common curriculum developed before the start of lessons. This section consists of four parts as well as the Introduction to VTC, Approach and Methodology used in the development of the content.
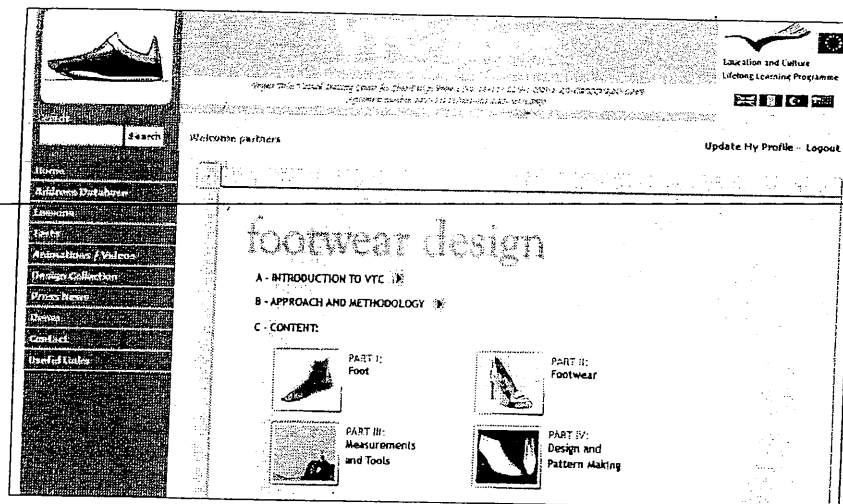
Part I covers the lessons related with foot focusing on the knowledge on foot anatomy and biomechanics applied to footwear design and pattern making. **Part II** is about footwear. It covers the lessons about materials used for footwear products, footwear structure, functions and classification criteria, lasts for footwear industry, footwear technology and technological allowances for pattern making. **Part III** consists of the lessons related with measurements and tools used in footwear design. The main topics are foot anthropometrics, measurement systems and tools for pattern making. **Part IV** covers the lessons related with design and pattern making:
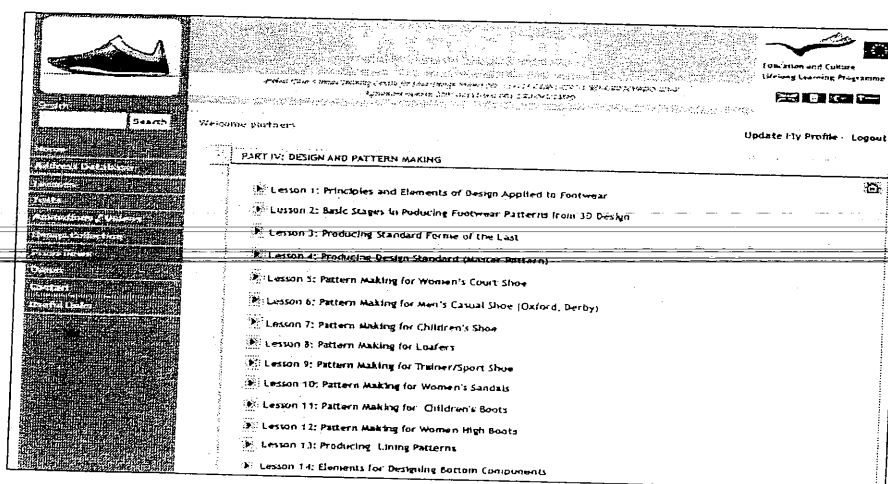
The button **Tests** includes the tests developed for the assessment of each lesson based on an interactive approach. Animations and Videos are the section that includes movies and animations classified according to the lessons:
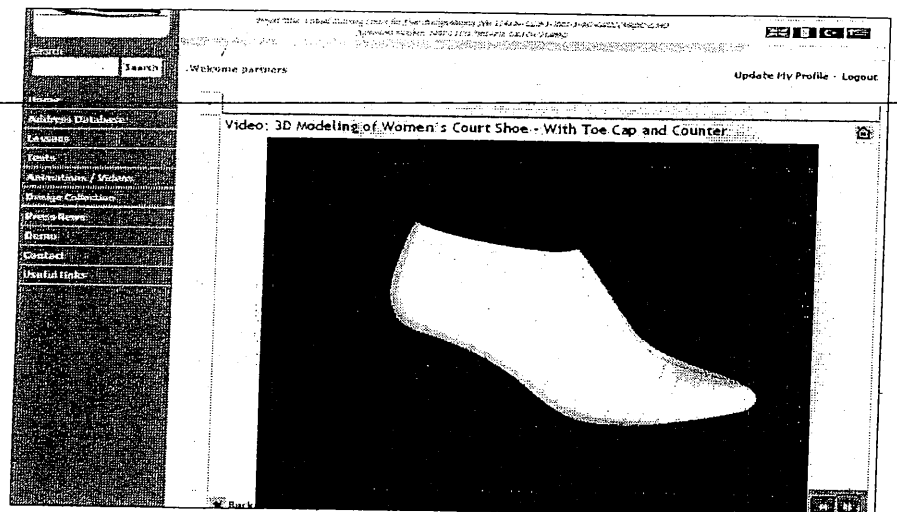
Design Collection includes the designs made by the trainers and trainees. Press New: is the section to serve the dissemination activities of the product through printed or visua media. The trainee can be in contact with the trainer or the product developer by using the contact form and can have access to useful links.

5. Pattern Making Loafers: Sample Lesson

The sample lesson chosen from Part IV of the training centre is lesson 8: Pattern Making for Loafers. The following slides are presented just to demonstrate the multilingual aspect of the product rather than the content details.
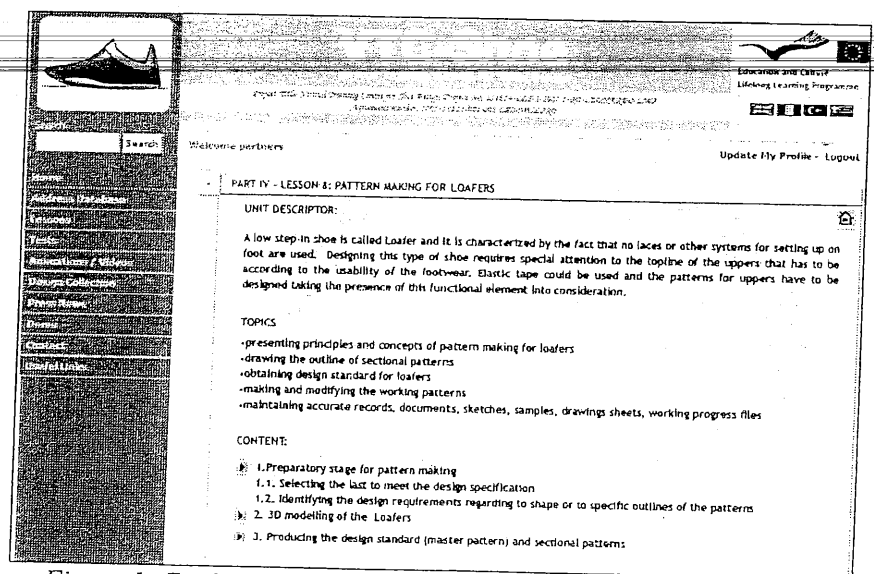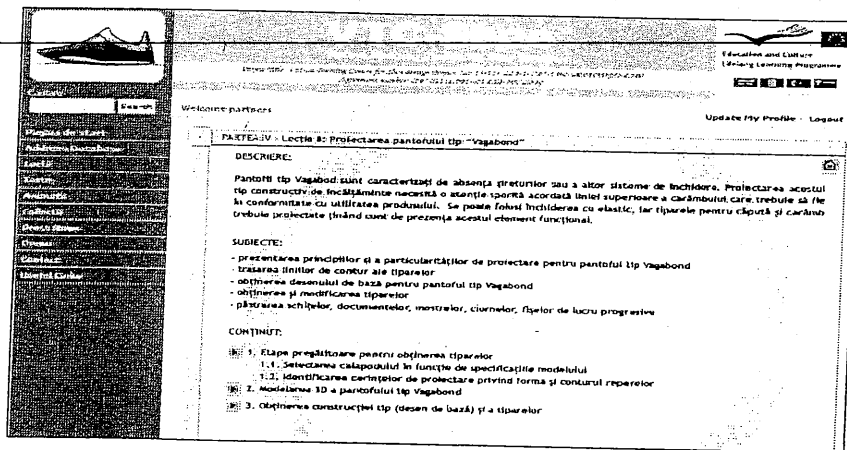
Figure 1: English version of Unit Descriptor, Topics and Content

Figure 2: *Romanian version of Unit Descriptor, Topics and Content*

Figure 3: *Turkish version of Unit Descriptor, Topics and Content*

Figure 4: *Greek version of Unit Descriptor, Topics and Content*

Figure 5: English version for Step 1: Mark the ball points
(3D Modeling of the Loafers)

Figure 6: Romanian version for Step 2: Draw the girth's reference line
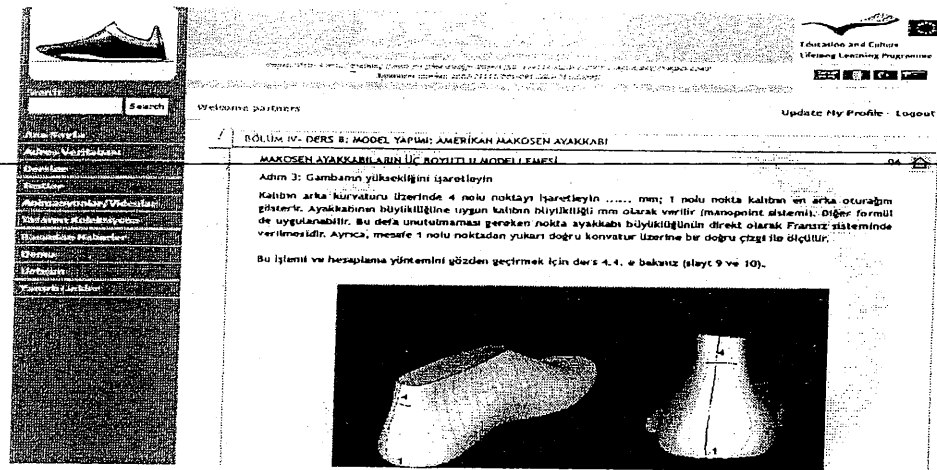*(3D Modeling of the Loafers)*

Figure 7: Turkish version for Step 3: Mark the height of the quarter
(3D Modeling of the Loafers)
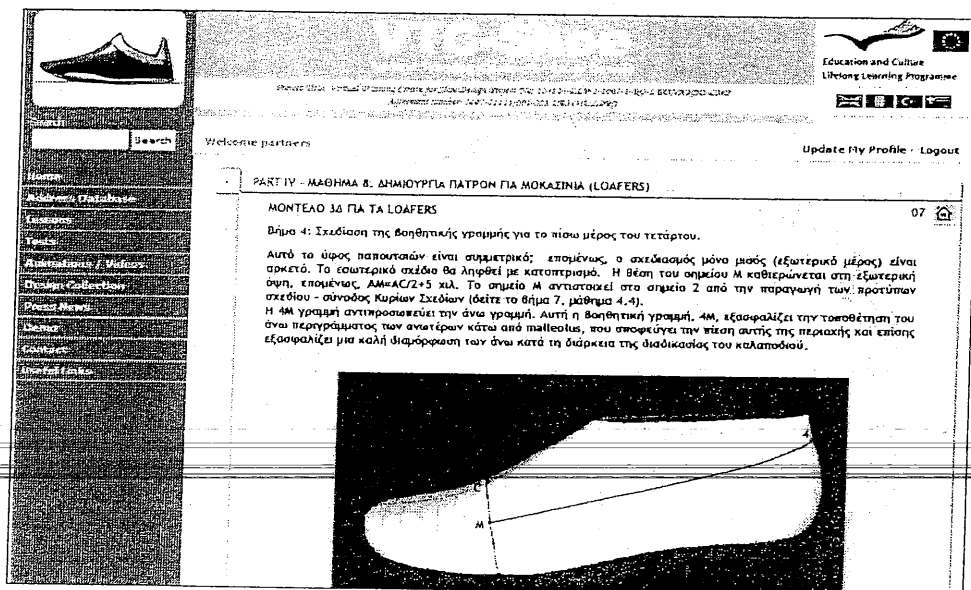
Figure 8: Greek version for Step 4: Draw the auxiliary line for back part of the quarter
(3D Modeling of the Loafers)

6. Conclusion

VTC-SHOE is a multi-lingual virtual environment in which the shoe design training is served in English, Romanian, Turkish and Greek according to the curriculum developed for this purpose up to intermediate level. As a training tool, the curriculum is in accord with the approach, methodology and techniques required for virtual training. As it is accessible by anyone who has membership or permission, anyone who is interested in

Educational software for the simulation of virtual dynamical systems

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Abstract

In this paper some aspects regarding the implementation of the control algorithms for virtual processes are presented. Virtual reality represents an easy approach to study the behaviour of the process. Using virtual reality one can achieve knowledge about the influence of the input and the output signals on the dynamical systems. Along the implementation of the virtual system it is necessary to do a solid modelling of all essential aspects of the real process. However, the virtual system is included into a control loop. Also, the actuator of the control loop is a virtual system and it can be servomotor, DC motor or step by step motor. The behaviour of the virtual actuator is based on the mathematical models or the static characteristic. To achieve compatibility between virtual systems and real systems it is required a card acquisition for the signal's adaptation. This educational software has two advantages. Firstly, when using the card acquisition, the virtual approach is very similar to the real one. In the virtual approach the control of the virtual system is made with electrical signals. Secondly, it is possible to analyze the system when reaching its limits.

Keywords: Educational software, virtual process, virtual reality, modelling

1. Introduction

Virtual reality is an artificial environment that is created with software and presented to the user in such a way that the user suspends belief and accepts it as a real environment. The simplest form of virtual reality is a 3D image that can be explored interactively at a personal computer, usually by manipulating hardware interfaces (Kovach, 1997; Peterson, 2001).

A VR application is made of different components (Burdea and Coiffet, 2003; Vince, 2004) which can be described as:

a) **The scene and the objects.** The scene corresponds to the world in which the objects are located. VR contains lights, viewpoints and cameras. The objects have a visual representation with colour and material properties.

b) **Behaviours.** The objects may have behaviours (Willans, 2001). For instance, they can move, rotate, change size and so on.

c) **Interaction.** The user must be able to interact with the virtual world and its objects. For instance, a user can pick up some objects or he can drag an object. This may be

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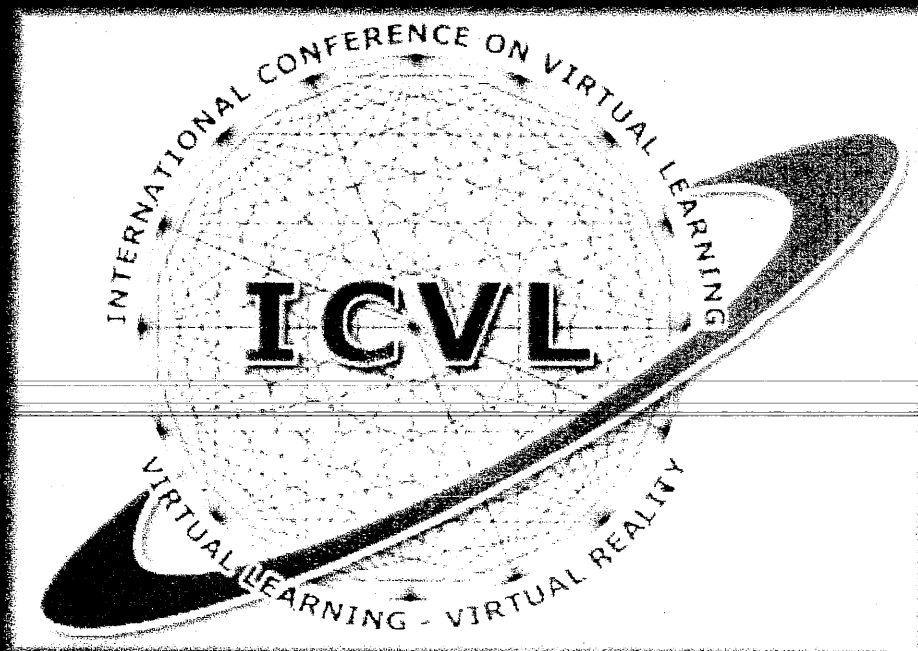
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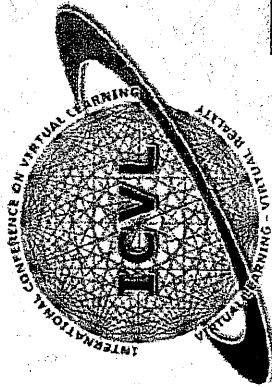Faculty of Electrical Engineering

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