

Web Design e-Course in MENUET Project-A Case Study

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Abstract: MENUET is EU Leonardo da Vinci project the aim of which is to develop arts and skills for teaching in the m-Learning era. The outputs of MENUET are four e-courses/e-books that can be used on mobile devices (e.g. netbooks) by trainers and students in order to develop their skills in using new technologies both for learning and teaching. One of the outputs is the 'Basics of Web Design' (BWD) e-course/e-book, which aims in teaching use of web technologies. It is based on modern design principles, like interactive learning, use of multimedia, self-assessment etc. An evaluation of the use of the BWD e-course has given promising results.

1. Introduction

The MENUET Project commenced in December 2008 and is due to be completed in November 2010. Its aim is to introduce students and their trainers to the new technologies involved in interactive E-books for self-paced learning. E-Learning Technologies use interactive multimedia (the simultaneous transmission via computer screens of text, graphics, computer software, animation, video, voice-over and music in stereo sound, as well as virtual reality worlds). The use of E-Learning Technologies allows user-interaction with controlling computer software programs and may be used effectively in education and training, Sophisticated computer hardware and software are available for the production of high quality flexible training materials and at low cost.

In order to accomplish the project aim, four main activities are being undertaken: STUDY, DESIGN, TEST AND EVALUATION and DISSEMINATION OF RESULTS. The STUDY activity involves studies on ICT (Information and Computer Technologies) and E-learning concepts, the production of a Guide to the production of interactive E-books, test methodologies and available hardware and software. The DESIGN activity involves the production of four E-books covering the Basics of Web-Design (BWD), ODL Techniques, E-Commerce (EC) and Energy Saving and Environment Protection (EP).

In this paper we present the first product, the e-book "Basics of Web Design". The objective of this e-book is to teach the basic (and more than that) technologies and methodologies related to web pages design and implementation. It is mainly addressed to trainers with little or no experience in web design and tries to pass them the required knowledge so they can be able to create their own e-courses. In that context, except from the basic knowledge about HTML and how to create simple web pages, the user will also receive lessons on how to create interactive exercises or organize an e-course using a Content Management System. Of course this e-book cannot provide a complete reference for the technologies presented. The objective is to give in a simple way, an introduction to them so the user can have a general understanding of the basics of web design. This way he will be able to decide which of the technologies presented are needed when creating a new web page and seek more specific content in other courses.

2. BWD E-Course/E-Book Contents

The BWD E-course/E-book contains the following six chapters:

“Basics of the Web”: This chapter answers the question what the WWW is, how it works and contains a quick overview of the technologies involved and the software that is required to create a web page.

“HTML Guide”: This is a short introduction to HTML, the language used for encoding web pages. At the end of this section the user will be able to change the style of text, to add images in web pages, create tables, lists and forms and use a CSS style sheet to change the style of a web site.

“Server Side Scripting”: This chapter is an introduction to server-side scripting, used for the creation of dynamic web pages, able to connect to databases. The user will be introduced with PHP a server scripting language, and SQL the most common language for creating and manipulating databases.

“Content Management Systems”: This chapter describes the use of content management systems to create an online course using examples in Moodle (Modular Object-Oriented Dynamic Learning Environment).

“Creating Exercises”: This covers the use of XML and Flash for creating Interactive exercises for a course.

“Forums – Wikis – Blogs”: This chapter introduces three types of web applications widely used on the Internet. Forums are online discussion sites. Wikis are websites that allow the easy creation and editing of interlinked Web pages. Blogs are websites containing regular entries of commentary, descriptions of events etc.

3. Design Principles

Interactive teaching materials enhance the learning process, are enjoyable and, using wireless networks, may be used anywhere, at any time and by anyone. An individual has the freedom to learn at one's own pace, to select the appropriate level and to pick times for study, so as to be able to study at work or at home or in travel. The use of this dissemination medium, if prepared carefully and comprehensively, can eliminate the need for face-to-face workshops, seminars, conferences, site visits and attendance at technical fairs, saving time, travel and fuels and so also reducing polluting emissions to air.

Apart from the above general principles, we followed a number more specific in designing and implementing the BWD e-course. These design principles and their implementation in the context of the BWD e-course are presented below.



Figure 1. The Introductory page of chapter “HTML Guide”



Figure 2. The basic user interface of the BWD e-book

Easy Navigation: The basic user interface divides the screen in three areas: the title area, the navigation area and the content area (see Fig. 1). The title area, which comprises the upper part of the screen, is fixed and contains the title of the e-book and other related info. The navigation area, which lies at the left-hand side of the screen, contains the table of contents of the book. At first level, the

names of the chapters are displayed. By clicking on each of them, a pop-down menu displaying the sections of the chapter is displayed and the title of the chapter is displayed on the top of the content area and a proper image in the center of it.

Useful info: At the beginning of each chapter, it's objectives are presented, as well as the chapter's level of difficulty and estimated time it will take (see Fig. 1). This way it's easier for the user to organize his studying according to his available time and level of experience and it also helps him navigate the e-book when searching for a specific answer.



Figure 3. The “try it” facility of the BWD e-book

Question-based Content: Clicking on a section's name its real content comes up in the content area. The content of a section is organized as a set of questions that we identified that the provisional users would like to be answered (see Fig. 2). By clicking on each question a more or less short answer is provided to the user. The answer may contain links to other questions' material or suitable images or some animation or some kind of interaction with user. By clicking again on the question, its content is hidden. So, in this way, the questions/answers will remain open and will be available to the user at anytime.

Learning by doing: An interesting facility of the e-book is the “try it” section (see Fig. 3). It allows the user to practice in any of the issues he/she has studied and see the results on-line. So, he/she can write his/her own html code and see directly the result on the same webpage. Also, it is integrated in many of the provided exercises.

Self-assessment: At the end of each chapter there are exercises in the form of multiple-choice questions (see Fig. 4). After submitting his answers, the user is presented with the score he achieved and the option to view the right answers.

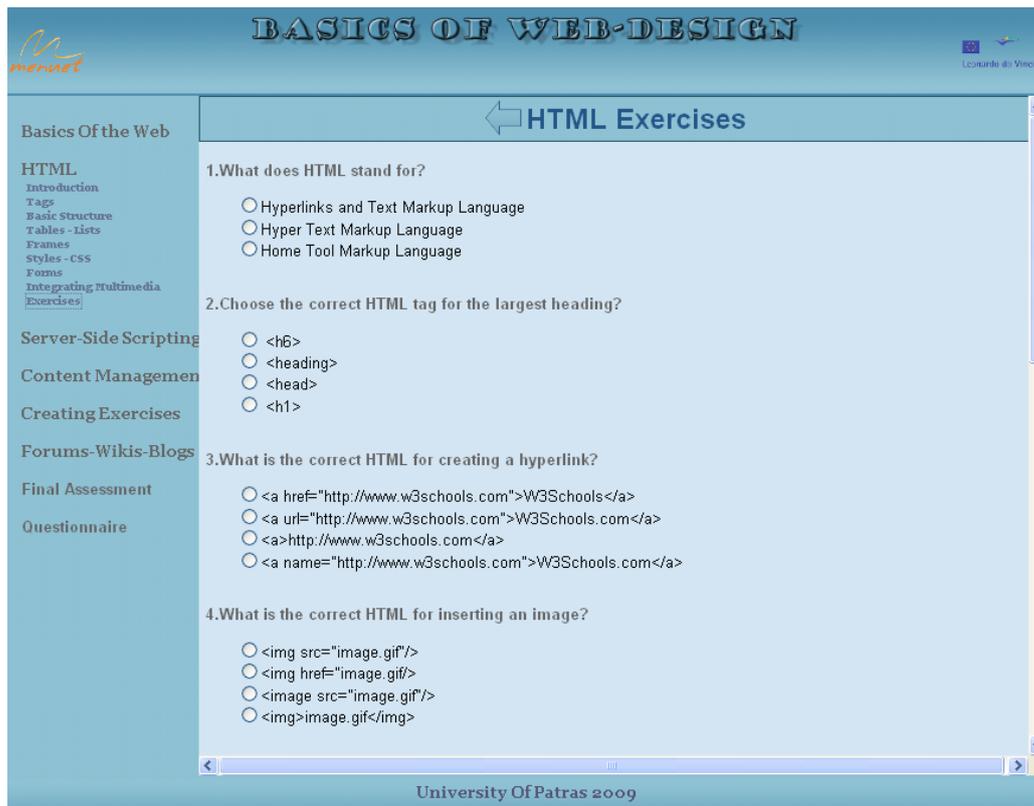


Figure 4. Exercises from the HTML chapter

After completing studying all the chapters of the e-book the user can try the “Final Assessment” section which contains exercises from every chapter and can provide a measurement of the apprehension the user has on the contents of the whole e-book. In contrast with the questions found in each chapter, the “Final Assessment” results are stored in a database as a way to test the effectiveness of the e-book in teaching the desired content.

4. Evaluation

To evaluate the BWD e-course and the use of the netbook technology for its delivery, we gave it to 20 users. They instructed to follow the chapters of the e-course in any order, study its contents, do the assessments and finally fill in a questionnaire. Here the users were asked to give their personal opinion about the e-course’s interface, its functionality and the overall impression they got from using it, as well as to propose any improvements or additions they would like to see. They were also asked to answer more general questions about E-learning and the different medium’s of delivery available.

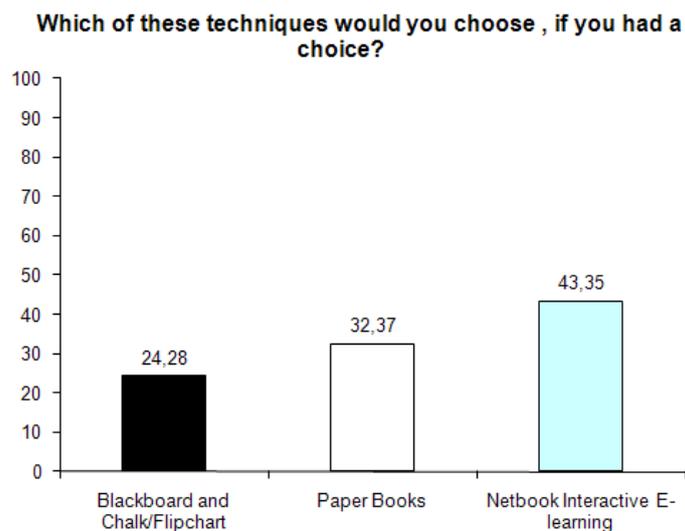
The results of the questionnaire are presented in the following tables. According to them, the majority of the users testing it agreed that it was easy to use and navigate. They also agreed that the graphic interface was clear and provided an interactive experience although some improvements could be made to make it more aesthetically pleasing and customized to the user’s needs.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The book interface is easy to use	40,00	55,00	5,00	0,00	0,00
The graphic interface provides an interactive experience	42,86	52,38	4,76	0,00	0,00
The graphic interface is clear	30,00	65,00	5,00	0,00	0,00
The graphic interface enhances the learning experience	20,00	60,00	15,00	5,00	0,00
The E-Book is easy to navigate	35,00	45,00	15,00	0,00	5,00
The entire graphic design is aesthetically pleasing	15,79	36,84	36,84	10,53	0,00
The E-book is customized to my needs	0,00	52,63	47,37	0,00	0,00

The three mediums of delivery that the users were asked to evaluate are “Blackboard and Chalk/Flipchart”, “Paper Books” and “Netbook Interactive E-Learning”.

	Blackboard and Chalk/Flipchart	Paper Books	Netbook Interactive E-learning
Is an interactive medium	21,02	27,84	51,14
Is a good way to learn	22,92	29,69	47,40
Is enjoyable	21,71	26,86	51,43
Is stimulating	24,47	29,26	46,28
Is user-friendly	25,54	29,89	44,57
Meets learning needs	25,76	31,82	42,42
Provides opportunities for practice	29,73	29,19	41,08
Provides feedback	25,30	29,52	45,18
Increases the speed of learning	24,73	28,57	46,70
Allows learning to be measured	21,93	27,81	50,27

The “Netbook Interactive E-Learning” medium was seen as the best way to learn, the most enjoyable, stimulating and user-friendly and the one that meets the most learning needs. It was also chosen as the medium that provides the best opportunities for practice and feedback as well as increasing the speed of learning and the one that allows learning to be measured. The “Paper Books” medium was generally the second preferred medium although it was considered the one that provides the least opportunities for practice.



5. Conclusions

There is an urgent need now to make the current education and training systems better available, more effective, accurate, and flexible in order to enable true training on-demand services for the individuals and their work-organizations. The key to a successful resolution to this need lies in the effective usage of e-learning methods and methodologies, especially their latest evolution – m-learning, which can provide the necessary learning content anywhere, anytime and to anyone. However, being a new technology, it requires complex testing and good mastering skills from those who will apply it, in order to achieve maximum effectiveness of performance improvement and return on investment. In the framework of the project **MENUET**, the authors are studying relevant didactical concepts and methodologies from the fields of mobile learning, “eco-field” and related computer technologies and applications, in order to respond to the increasing need of specialists working in environment protection field for mobility and availability of information-on-demand. In the “Basics Of Web Design” e-book we followed the above principles giving emphasis in the interactive presentation of the material and the feedback was encouraging showing that this type of learning is much preferred by learners although traditional ways of learning are still more appropriate in many cases.

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