e-EPBD: A distance training tool for the energy performance buildings directive

D. Kolokotsa, G. Saridakis
Technological Educational Institute of Crete, Greece

O. Fenekos, A. Karagounakis, D. Tsoukakis
Next Step S.A, Greece

ABSTRACT

The scope of the present paper is the presentation of a dynamic and interactive vocational training tool for the implementation of the Directive 2002/91/EC.
Certain features of the tool that depend on the existing legislation and restrictions in each country and certain characteristics of the trainees (e.g. profession, scientific background) that influence in a great or in a small extent the training procedure in each case are analyzed.
Keywords*:* Energy Saving in Buildings, Interactive Vocational Training, Directive 2002/91/EC.

1. INTRODUCTION

The building sector constitutes approximately the 40% of the total energy consumption in EU. Therefore, it is essential to improve the energy efficiency in buildings. The Directive 2002/91/EC (EPBD) provides a precise legislative framework for improving the energy performance of the built environment.
It was adopted on December 2002 and entered into force in January 2003. According to the article 15 of this Directive (Official Journal, 2003) all member states have a time period of three years (till January 2006) to implement the Directive in their own countries. Till today all member states have already or will, in the near future, bring into force relative laws, regulations and administrative provisions necessary to comply with this Directive. According to the European Commissioner for energy it has been well understood that up to 22% of energy savings could be achieved in the building sector, in Europe, if the economic indicators permit so, by 2010. The Directive 2002/91/EC can contribute to the realization of this aim. As mentioned in the previous section, EU countries are at a transitional stage regarding their national regulations and harmonization with the EPBD. Therefore the e-EPBD tool faces the following challenges:
• The training material changes and evolves everyday.
• The EPBD has a great number of aspects and is addressed to different professionals and disciplines.
Therefore at the present time, the requested training needs cannot be met since the material is under reform. The scope of the present e-EPBD tool is to:
• Help potential trainees to find useful information.
• To group potential trainees that face similar problems in order to exchange experience.
• To provide the ability to change/expand/reduce/ the existing information.
• To adapt the training material to the trainees' needs.
• To provide a global format for the training material that is provided.
The tool has the following characteristics (http://training.eebd.org):
• Nice layout and soft colors that are not annoying or/ and tiring the user.
• Friendly environment. There is been emphasized the usability and visitors expertise.
• It is based on .NET framework
• It provides flexibility on the structured material by adding/ removing –updating the upper buttons, tree and material.
• Expandable content management.
• Single sign-in philosophy.
• Announcement pages, courses, quizzes are easy to structured and delivered. This can be done by a friendly but powerful administrator tool.

2. PRESENTATION OF THE e-EPBD TOOL

The design of the general structure of the tool was started based on the existing information concerning the Directive, its implementation in each European country and the results of a "training needs" questionnaire that was distributed to an adequate sample of different groups of interested parts in as many European Countries as possible (Bozonnet et al, 2006a). The "training needs" evaluation results were the basis for the tool design. Also, the questionnaires initiated a valuable feedback habit for training content and the regular update of end user needs in order to keep the future dynamic training tool up to date (Bozonnet et al, 2006b).

2.1. The home page

The home page of the e-EPBD tool is depicted in figure 1. There is a top-banner with some listed tabs (buttons); Home; The Directive(s); the Learning material; the Suggested Reading, and the Forum. (Kolokotsa D. et al , 2006) These Tabs are accessing the main modules

of the e-learning tool which are also accessible from the bottom-screen buttons, which are always shown.
At the upper right of the tool four interface languages are shown (English, German, French and Greek). The default language is English. Furthermore it is remarkable that the language of the material can change also to a number of European languages independently the interface language.

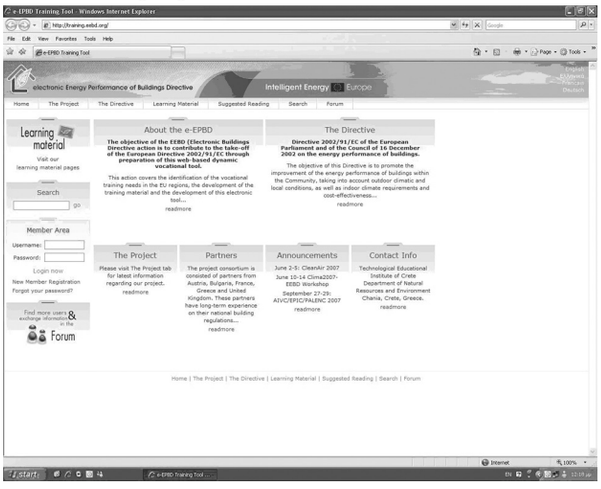

Figure 1. The home page of the e-EPBD tool.

2.2. The Learning material

The training material's structure is based on the EPBD articles. The main intention of the training material was to support take-up of the directive and to cover certain issues namely (TEI of Crete et al, 2006), (Sutherland et al, 2006):
• Introduction to the topics in a general informative manner.
• Provide specific details to assist and permit application through heightened awareness.
• In the first two levels of the general background and supportive information are presented certain issues concerning:
• Policies
• Energy consumption in buildings.
• Databases, publications, CEN standards
• National contact points and information.
The main characteristic of the training material is its global and regional approach as depicted in Figure 2.
The specific information of each Member State is formulated in a tree form and includes training material for:
• Methodologies for integrated energy performance standards.
• Applications of such standards on new and renovated buildings.
• Certification schemes in M.S. for all buildings.
• Inspection of boilers/heating and cooling installations.
Simultaneously and dynamically a tree is shown at the left screen of the tool that assists the navigation of the trainees to all other countries.

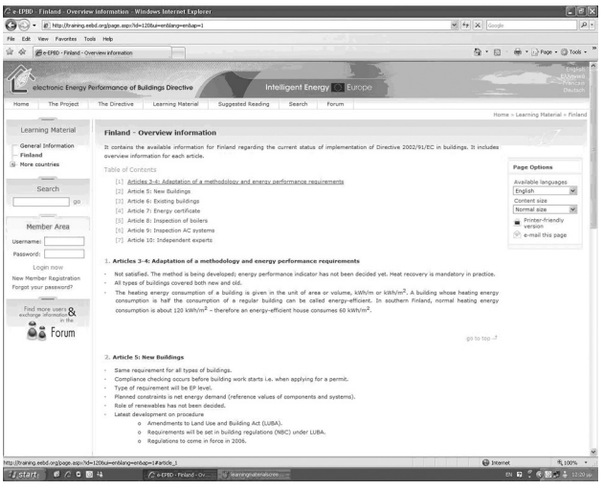

Figure 2. The training material

2.3. Tool's rating and evaluation procedure

At the bottom of each module, a rating pane is placed. Through the rating process the trainee can evaluate each module with a (five) 5 ranking list. The rating pane is illustrated in figure 3.

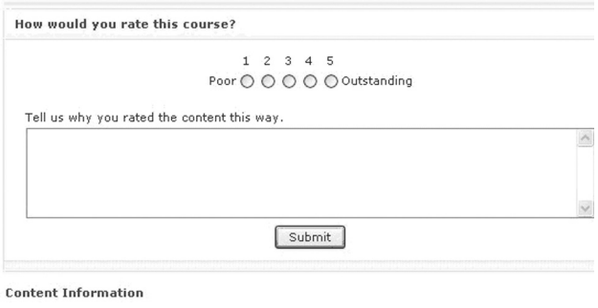

Figure 3. The rating pane of e-EPBD

The outcome of the voting is shown dynamically at the end of the lesson's page (figure 4). A user can always see the voting results for a specific lesson whenever wants to. These votes are getting gathered to a database and then are used in order to create the suggested reading pane.

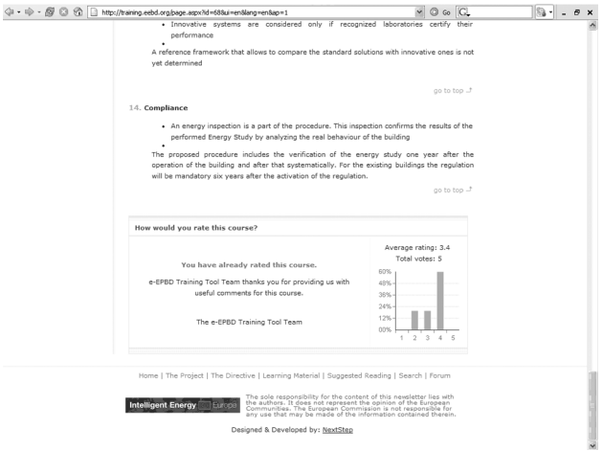

Figure 4. The statistics of the voting for a specific course.

The "suggested reading" pane contains; The "overall", "by profession" and the "suggested by e-EDBD team". The "overall" ranking shows the best five document information independently the field of interest, article, country or profession. The "by profession" ranking shows the best five documents that voted other users with a specific profession. The "suggested by e-EPBD" shows newly and interesting information in order to inform the users more efficiently. All these top rated modules are placed in the suggested reading page where each trainee can find easily and without having to visit all modules, what modules other trainees found more attractive and useful (figure 5).

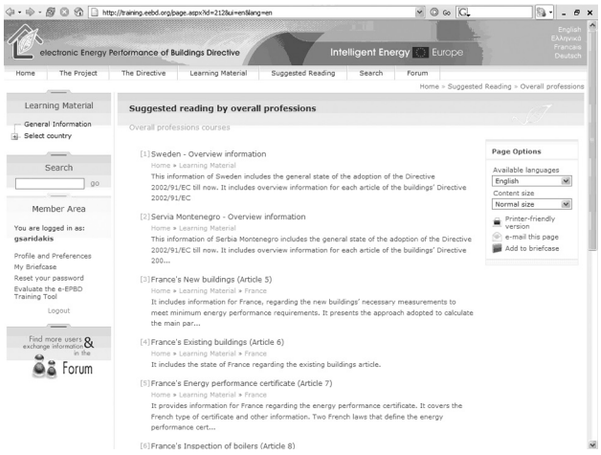

Figure 5. The suggested reading by overall profession

The tool is designed to be dynamic. Its' contents are possible to change depending on the users' needs and the new data. In addition the aim is to improve the tool and the information delivered continuously. This improvement needs the evaluation of the final user (figure 6.)

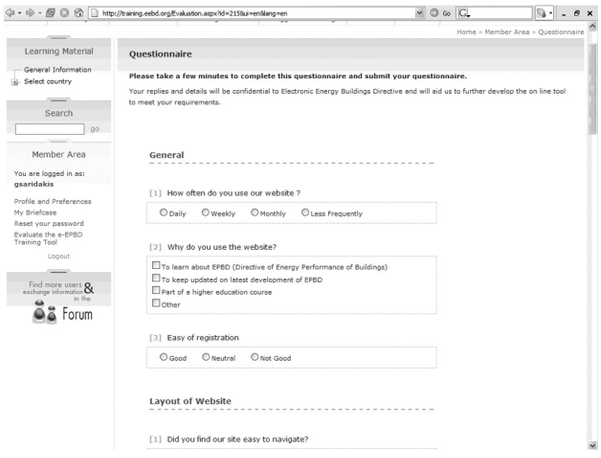

Figure 6. The evaluation screen of the tool

2.4. The Forum

The Forum was designed to provide a way to connect all people interested in matters of energy saving and relevant technologies in Buildings. It is assumed as a central contact point for engineers in order to create topics depending on the interests. The Forum is divided into two sub forums. The public forum that is accessed from the registered users and the private forum that is accessed from the EPBD administrative members only (figure 7).

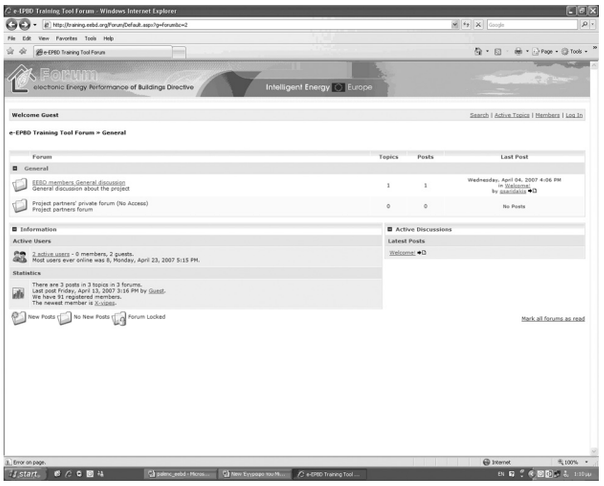

Figure 7. The Forum of the e-EPBD tool

The Forum environment supports extended capabilities of sending and receiving messages. At the main page the user can view several interesting information as;

• Statistics (number of posts, topics, forums, registered users, and date of last post)

• Active users' information (number of active users, members and guests.

Inside a topic there is shown information as;

• Topics folder

• Topic starter

• Replies

• Views,

• Last Post

Also there is the possibility to view the date of the most users ever online as well as the possibility to view the users' information (interests, contact details etc). This capability helps the exchange of information and knowledge between the users regarding their common interests.

2.6. The administrator's tool

The aim of the administrator's tool is to increase the platform's flexibility and expandability and performs deleting, changing-adding or removing material, tabs and new pages. The admin tool has a lot of capabilities such as:

• The information provided can be easily changed, i.e. to include more chapters in the future.

• Does not need specific software expertise or software licenses.

• Can be easily expanded.

• The info – material is accessed easily.

• Provide a series of "more documents" (i.e. legislative info, technical info, etc).
• It is easy to be maintained after by potential future hosting.
• Can incorporate in the future activities such as simulation tools, evaluation, audio, video and/or laboratory exercises per country or per article or general.
The whole philosophy is tree-based as it is depicted in figure 8.

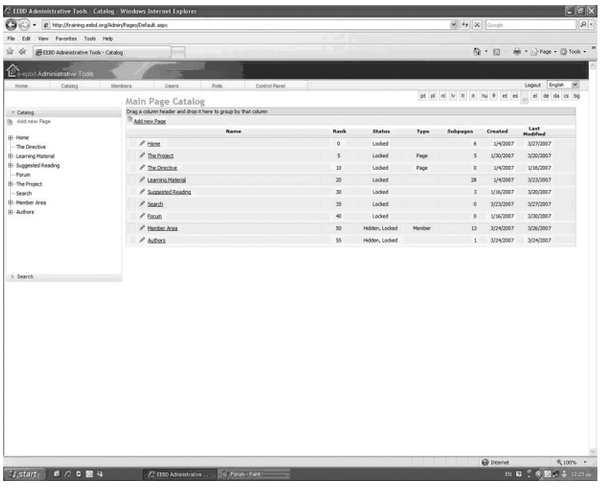

Figure 8. The admin tool

The admin tool has several tabs that comply to the tabs of the front end of the tool, i.e. the home page, the catalog, the members and the control panel.
The *catalog* is the most important part of the admin tool as gives the right to the administrator to update and/or expand the existing training material and/or buttons.
A tree of the content is presented at the left side of the screen. A box with a plus (+) shows that other information is included (pages or courses). The catalog includes the names of modules, ranking capabilities, type of information uploaded, etc. The administrator can use any of the languages interface in order to upload material in all EU languages.

3. CONCLUSIONS

The e-EPBD tool can has a lot of dynamic characteristics
• Can change easily (for example to include more directives or more chapters in the future).
• Does not need specific software expertise or software licenses.
• Can be easily expanded.
• The information and other material are easily accessed.
• If users think that the information is poor then can be changed and/or updated.
• Provides a series of ….more documents (i.e. legislative info, technical info, etc).
• It is user friendly.
• Can be easily maintained after by anybody who would like to host it (European Community, etc).
• To include in the future activities such as simulation, evaluation, ion, audio, video and/or laboratory exercises per country or per article or general.

acknowledgments
The work described in this paper has been supported by the ARCHIMEDES project of the Operational Programme for Education and Initial Vocational Training (EPEAEK II) under the 3rd European Community Support Framework for Greece and Hellenic National resources.

REFERENCES

Official Journal of the European Communities (2003): Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings, L1/65.
Bozonnet E., Allard F. (2006a). Development of an interactive vocational web training tool for the take-off of the buildings DIRECTIVE 2002/91/EC. EEBD. WP1: Report on the vocational training needs. LEPTAB, Universite De La Rochelle.
Bozonnet E., Allard F. (2006b). Development of an interactive vocational web training tool for the take-off of the buildings DIRECTIVE 2002/91/EC. EEBD. WP1: Report on participants' profile. LEPTAB, Universite De La Rochelle.
TEI of Crete, AEE-INTEC, BRE, REHVA. (2006). Development of an interactive vocational web training tool for the take-off of the buildings DIRECTIVE 2002/91/EC. EEBD. WP1: List of educational material. TEI of Crete, Chania.
Sutherland G., Kolokotsa D. (2006). Development of an interactive vocational web training tool for the take-off of the buildings DIRECTIVE 2002/91/EC. EEBD. WP2. Report for syllabus and methodology. TEI of Crete, Chania.
Kolokotsa D., Karagounakis A., Stefanou C. (2006). Development of an interactive vocational web training tool for the take-off of the buildings DIRECTIVE 2002/91/EC. EEBD. WP2-WP3: Report of specifications of the static plus dynamic part of the EEBD interactive training tool. TEI of Crete, Chania.