

Virtual University as a New Learning Environment

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Abstract — Learning process can be described as a construction activity. As important as the contents, are the means and tools used in that process.

On the other hand, the number of students that assist regularly to the educational centre has reduced significantly within the last decades. Some reasons for that absenteeism can be a simultaneous job or the geographical distance existing between the University and the place of residence of the students.

In order to provide students with a quality teaching, virtual simulation of scenarios can be used. The objective of this purpose is to show different resources of the University Centre, allowing visitors to access them easily. Some examples of these resources are videos in classrooms, database of books in the library, information of the advisement boards, multimedia material for practices, etc. All of them will be integrated in a virtual environment, which shows the real appearance of the Industrial Engineering College, in the University of Extremadura.

The different scenarios have been created by connecting photographs of the real space. After taking enough photographs, they are linked so that the visitor feels s/he is travelling through the College building. If s/he wants to enter a laboratory to make some practices, s/he must go through the corresponding walkways and stairs to the lab door. Then, clicking on the door, s/he can enter the laboratory and use the available tools.

In the same way, the student can enter the classrooms, the professor offices, the library, etc.

This project is now been developed. Some scenarios have been already created, and some resources have been introduced. Several groups of students are now testing the resulting material. However, there are still many targets to reach, such as to complete scenarios, to introduce more resources, to actualise the material and to achieve other professors to participate in the project.

Index Terms — learning environment, virtual University

INTRODUCTION

The absenteeism in the classrooms is a increasing fact. Factors that influence in it are the fact that the student harmonises the studies with an employment or the geographical distance that separates the educational centre of its habitual residence

So that this absenteeism does not diminish significantly the quality of the teaching received by the student, virtual techniques of simulation of settings, or Virtual Reality, can be employed. Through this technique, different resources are put available to the students, and any another user interested. These resources are the same used in the traditional high education, particularly, the lessons given, the centre facilities, the bibliography and educational material, the practices equipments and guidelines, the academic information and, in general, the knowledge of the environment in which traditional high education carries out.

As initial tool to reach the previous objective, videos are being employed and static photographs of a university college, concretely of the Industrial Engineering College, in the University of Extremadura.

With it, the student will be able “to sail” by the building, acceding to each available resource. The resources location in the material will coincide with the one that have in the real building, with a double objective: for the students of new income, to familiarise with the environment where they will carry out their university studies; for the ones that already know the centre, to familiarise them with the use of the virtual tool.

DESCRIPTION OF THE SETTINGS

Entrance to the College

The main entrance of the College will be the first image that the student will find in its virtual visit.

Figure 1 shows that first image. Really, the doors (there are three ones that permit to enter the left part of the college, the central part or the right part, respectively) are found closed, and they only will open after doing a “click” on them, to give more interactivity to the product.

After entering the lobby, the visitor will find three possibilities of navigation.

- On the left s/he will find the snack bar, where s/he will be able to find information of leisure, sports, cultural activities, and other events.
- Opposite the door, the porter’s office and some boards of general information are placed. In this space there will be available , among others documents, a map of the centre, with indication of each one of its rooms, information about scholarships, publicity, aids, etc. Likewise, it will find academic information (schedules of class and tutorials, periods of registration, regulatory of exams, etc.) and will be able to consult a listing of the teachers of the centre, or to contact with them.

Figure 2 shows the view opposite the door, where the links to the boards and to the porter’s office are marked. Once a resource is reached, for example a board of announcements, a listing of the available information there is exposed to the user, to read and/or download it.

- The third option is to turn right, where the assembly room and the graduation hall are. There the student can consult the event timetable and download multimedia presentations or videos.

FIGURE 1

MAIN ENTRANCE OF THE INDUSTRIAL ENGINEERING. COLLEGE

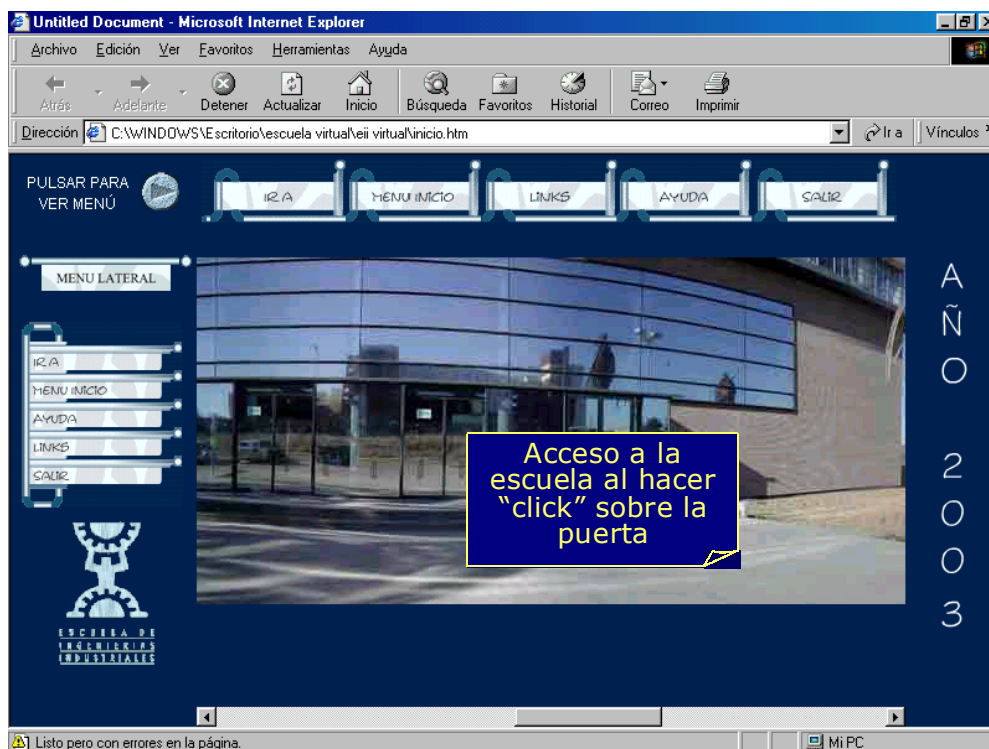
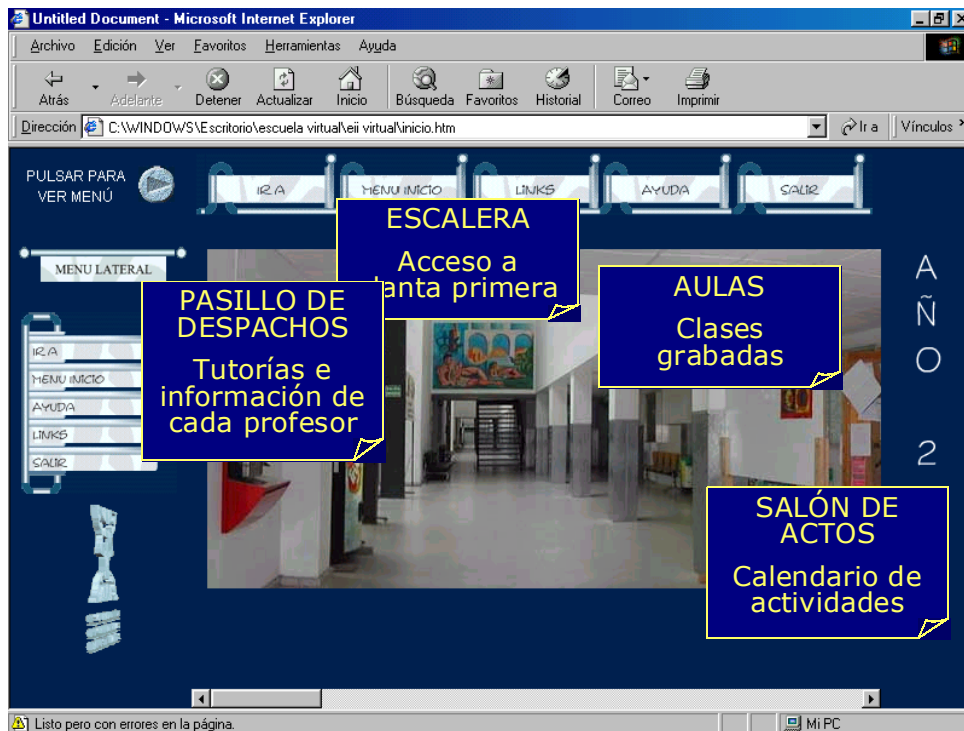


FIGURE 2
VIEW OF THE CENTER HALL, OPPOSITE THE ENTRANCE .



FIGURE 3
VIEW TO THE RIGHT SIDE OF THE LOBBY.



Following the same option, the visitor can find the classroom corridor in the bottom floor. There are links to the classrooms there (there will be videos of classes, recorded by means of WebCam), or to the offices and laboratories corridors, or to the stairways that lead to the first floor (Figure 3).

The options that exist in the actual Centre, will appear as such in the virtual one, by means of a virtual picture (created starting from numerous pictures from different angles, which allow to give sensation of camera movement to the photographed object) of that point with several access alternatives to other spaces. Depending on the alternative that the visitor chooses (by means of a "click" in an area of the picture) s/he will find a new space, appropriate to the actual distribution that the building presents.

The first floor

In function of the stairway or elevator through which the student arrives to the first floor, s/he will find a different virtual scenario. This fact will condition the possible paths that are presented to him.

Once in the corridor of classrooms, we can go to the outside-left, where it is the reprography room (in this place there will be available, in pdf or doc formats, the notes, transparencies or another educational material that the faculty has provided the students with). We will also reach the Secretary (there we will be able to consult normative of the Centre, to be informed on terms and administrative steps, and even to download normalised forms). Lastly, we will find the office of the Council of Students, where we will be able to consult the information available there.

The Top Floor

The most outstanding place here is the library, located on the left, at the end of the corridor of classrooms. There, the student will find a modernized database of the bibliography, technical norms and available End of Career Projects. He will also be able to consult the library normative and to get links to Web of interest, as REBIUN (Net of University Libraries) and others.

It is also interesting to visit computer science classrooms, in the nearest corridor of offices to the library. There he will find the student software of free diffusion and *demo* versions of other software, as well as links to their Web pages.

The Offices

Once the student has entered a corridor of offices, in one of its sides s/he will find the different doors with the corresponding teacher's name. After crossing one of them (as always by means of a "click" on the door), s/he will be able to contact with the teacher (first by e-mail, although the possibility of carrying out tutorships by video-conference in real time is foreseen). In the case of teachers that have own Web page, the corresponding link will also be in its office, as well as any other resource that the teacher wants to provide students with.

The Laboratories and Classrooms

Global views of the laboratories, images of the equipment and resources available, manuals of practices and software and multimedia material (of simulation of tutorial practices through images and interactive videos) are there in these rooms. At the same time, the student will be able to carry out virtual practices on the equipments and systems of the laboratory.

Figure 4 shows one of the panoramic images of the Laboratory of Electric Systems. On this picture, the visitor will be able to "click" on some of the equipment to open an interactive manual of Virtual Practices, or a simulation software that allows him to carry out the practices programmed. These practices have been developed by the team author of this paper and have been presented in other papers [8].

In Figure 5, a classroom of the Centre can be observed, in which a lesson written through the blackboard is shown. The student can vary, among other options, the speed of presentation of the lesson, its format, ... In that screen, the student can also "click" on the overhead projector and to observe some of the presentations carried out by the teacher. On the other hand, the student will also have an option to see the lesson recorded by WebCam.

FIGURE 4
LABORATORY OF ELECTRIC SYSTEMS

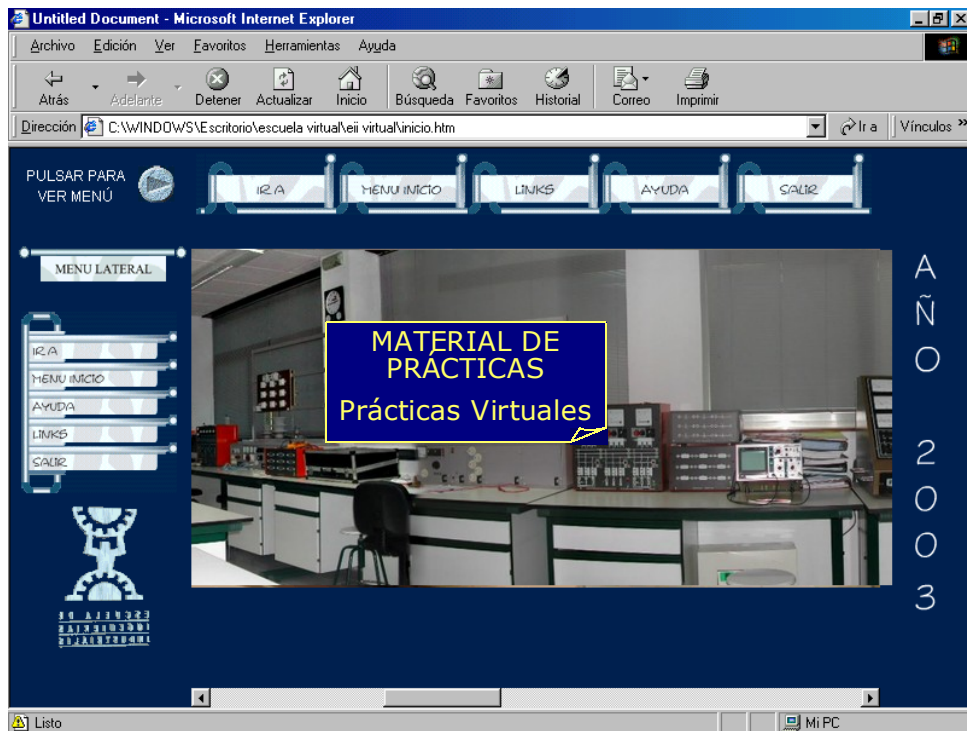


FIGURE 5
CLASSROOM



ACCESS TO THE RESOURCES

The resources available for each student must be under control. This is justified by the convenience of guiding the student in his learning process.

In this way, the general information about the centre (maps, information published on the boards, normative, etc.) as the possibility of contacting to the teachers will be available for any user.

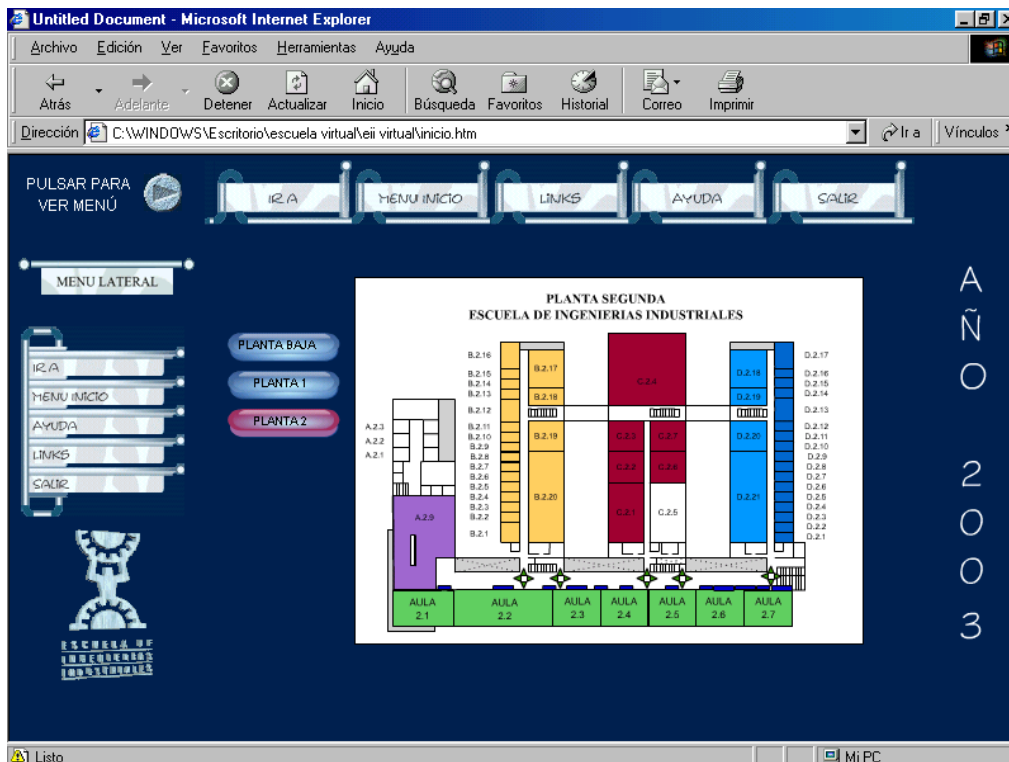
In order to access other resources the student must identify, by giving the whole name and his National Identification Number. This data will be compared with the data collected from the centre secretary in order to determine the subjects that are included in the student expedient. Allowing or denying the access to some resources (recorded lessons, practices or learning material available in the reprography service, exam results ...) will be done according to this data.

All the centre's students could access to the secretary, library and computer classes information and resources.

The access to selected resources, listed in the created virtual scenarios, for other users will be controlled in the same way.

In the developed material a quick access for all the resources exists, that is very useful for the students who know the centre or who want to access in agile way to the desired resource. The student must select the room where the desired information is located directly from the map, that is shown in Figure 6.

FIGURE 6
QUICK ACCESS BY USING THE MAP OF 2ND FLOOR



ACTUAL STAGE OF THE PROJECT

The described project is just developing. A lot of images and videos have been taken in order to realise the necessary virtual scenarios and the navigation paths.

In the first stage, the authors of this paper had made material related to their teaching subjects. These materials are recorded lessons of Electric Engineering subjects, practices and their contact address.

In the actual stage other institutional resources are being added, allowing other teachers to join the project, in order to simulate the centre and its activities and resources in the most complete way.

It would be interesting that similar initiatives will be started up. This would allow to develop a more wide virtual

scenario: national or international, by cancelling the educational borders.

For obvious reasons, at this moment we cannot navigate through the created virtual scenarios in the written paper, showing just static images of them. However, the student or user in the real navigation could choose among different paths, feeling the sensation of moving through the real centre. If s/he "click" on any of the active places, s/he will link with other virtual scenario, or s/he will be able to download a file, or the large views of a scenario, At every moment a indicator arrow on the building floor will guide him.

Actually, several agents are interested in joining the project, by financing it. Among them we could find electric and air-conditioning companies. Now, first stage of the project is completed, and it is available on a Web site, where to consult or access to the commented material is possible. There is a test web available on the site www.electriconica.com.

CONCLUSIONS

The problems to attend to the university centre in a regular way do not constitute an important problem for the student that for geographic, economic or professional situations, do not attend to the centre.

It is necessary to note that initiatives like this one, are not sufficient to substitute the traditional educational way in the centres: The relationship of the professors with their student course groups, with their materials and with their laboratory instruments are very important for the student learning process and, in addition, is very necessary to develop other qualities useful for the professional life, as the ability of social relationships and of working in groups, the manager capacity, the public defence of the works, etc.

The objective of this initiative is to complete the classic education using a material which can supply the limitations of a student who does not normally attend the educational centre.

We must not forget that the actual trend in the Spanish University, where the number of student has began to minimise is to plan new learning ways. No by quitting the traditional way, but incorporating to the educational system the students or users that can not use it if the virtual education does not exist. For the rest of students or users the proposed system will be a significant improvement to their learning process: it will be possible to repeat a session, to access to a needed information (without considering the day or time), etc.

REFERENCES

- [1] Carmona, D.; González, E.; Álvarez, J.A.; Reyes, A.M.; "Empleo de las Nuevas Tecnologías en la Enseñanza Universitaria: Prácticas Virtuales en el aprendizaje de procedimientos". Vigo (España): IX CIEET, 2001. ISBN: 84-699-5659-2.
- [2] Carmona, D.; González, E.; Álvarez, J.A.; Romero, E.; Montanero, J.A.; Iglesias, E.; Mateos, V.L.; "La enseñanza virtual de la ingeniería eléctrica: un profesor en red". Badajoz (España): Acta de la XI Reunión de Grupos de Investigación de Ingeniería eléctrica (publicación electrónica), 2001. ISBN: 84-699-4725-7.
- [3] Carmona, D.; Álvarez, J.A.; González, E.; Romero, E.; "Nuevas Tecnologías en instalaciones eléctricas: aplicación en hipertexto". Badajoz (España): Acta de la XI Reunión de Grupos de Investigación de Ingeniería eléctrica (publicación electrónica), 2001. ISBN: 84-699-4725-7.
- [4] Carmona, D.; Álvarez, J.A.; González, E.; Romero, E.; "La importancia de la observación en la clase, de las manifestaciones físicas en el entorno exterior de los conceptos teórico-prácticos desarrollados en ella: Metodología de proyectos". Huelva (España): Sixto Romero Sánchez, 1999. ISBN: 84-931043-0-2.
- [5] Carmona, D.; Álvarez, J.A.; González, E.; "Prácticas de Instalaciones Eléctricas". Badajoz (España): Edición de los autores, 2002.
- [6] Plomp, T.; Ten Brummelhuis, A.; Pelgrum W.J.; "Nuevos enfoques para el aprendizaje y el empleo de las tecnologías de la información y la comunicación en la educación". Santa Cruz de Tenerife (España): Fundación ECCA, 1999.
- [7] Carmona, D.; Álvarez, J.A.; González, E.; Romero, E.; "Las Nuevas Tecnologías en la enseñanza de la Ingeniería Eléctrica". Cáceres (España): Acta del I Congreso Internacional "Retos de la alfabetización tecnológica en un mundo en red", 2000. Depósito legal: BA-597-2000.
- [8] Carmona, D.; González, E.; Álvarez, J.A.; Flores, J.J. "Prácticas Virtuales en Ingeniería Eléctrica como Herramienta de Innovación Educativa". Valencia (España): aceptado para publicación en Acta del X Congreso de Innovación Educativa en las Enseñanzas Técnicas. 2002