

AUDIO-VISUAL LIBRARY FOR BILINGUAL EDUCATION ON RAILWAYS (BAUFERR)

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ABSTRACT

Despite the differences that may exist between the different Schools of Civil Engineering, Railways is an eminently practical subject and its purpose is that students learn not only the theoretical design of railway lines, but also the construction, management and operation processes.

Concerning the design of railway lines, it can be taught in the classroom, through theoretical and practical classes. However, the entire construction process, testing, maintenance and operation of the rail system include processes that are difficult to illustrate in class, only using words, text or pictures.

The most appropriate way for students to understand all these processes would be their presence in them, but this would be very difficult and expensive. So, in addition to the usual teaching aids (textbooks, board and slides), it is considered very helpful for the teaching in Railways to have an audio-visual library (BAUFERR). It compiles videos of all practical aspects included in the subject and mentioned above. This library will be bilingual (Castilian / English), with the aim of improving the training of students for working abroad.

The BAUFERR is being developed within the Programme for Innovation and Good Teaching Practices of the University of Granada (UGR), which emphasizes the need for the development of innovative educational materials on line. During its development, it is located in the Teaching Board at the Teaching Support Resource Platform of the UGR. When completed, the BAUFERR will have universal access through a website and the publication of a DVD.

1. INTRODUCTION

Despite the differences that may exist between the different Schools of Civil Engineering, Railways is an eminently practical subject and its purpose is that students learn not only the theoretical design of railway lines, but also the construction, management and operation processes.

Concerning the design of railway lines, it can be taught in the classroom, through theoretical and practical classes. However, the entire construction process (earthworks, construction of bridges, tunnels, stations, assembly and welding of the track, etc.), testing (infrastructure, approval of new trains, etc.), maintenance (track maintenance, preventive maintenance, etc.) and operation of the rail system (control and management of the railway traffic, rail transport operators, rail infrastructure manager, etc.) include processes that are difficult to illustrate in class, only using words, text or pictures.

The most appropriate way for students to understand all these processes would be their presence in them, but this would be very difficult and expensive. On the one hand, the organization of a trip with all students could be difficult due to both schedules and the limited financial resources. On the other hand, these processes are usually in remote and changing locations. Moreover, the access to the workplace is often restricted due to safety concerns.

Therefore, students cannot learn construction, management and operation processes in situ, so in this paper a new teaching concept is shown: an audio-visual library. Some videos including practical railway issues are collected in this audio-visual library.

Moreover, at the moment Civil Engineers are suffering a high unemployment rate in Spain despite having a great worldwide reputation. Regarding railway projects, Spanish companies are a world leader and most of them are going abroad. So learning English is essential for working and, for this reason, the audio-visual library will be bilingual, in order to learn technical railway concepts in English.

University of Granada provides teachers with an online platform (PRADO) that contains some teaching support tools such as a Teaching Board. The “Innovation Program and Good Teaching Practices” emphasizes the innovative nature of web educational materials, including multimedia materials (Jiménez del Barco, L and García, M^a del Carmen, 2012; Jiménez del Barco, L and García, M^a del Carmen, 2013). Furthermore, the multimedia teaching materials such as videos support practical subjects learning. In this context, the Innovation Program and Good Teaching Practices approved a project called “Audio-visual Bilingual Library for Railways Teaching” (BAUFERR). This project is supervised by Mr. Francisco Javier Calvo. Other professors of Civil Engineering Department are also working in this project.

2. OBJECTIVE

This project aims to develop some teaching materials that improve the railway learning. The subject contents are provided in an audio-visual and bilingual format, which is an advantage with respect to the current way of teaching. The specific objectives of this project are:

- To improve teaching in the subject Railways in the Civil Engineering Degree.
- To develop innovative educational material including audio-visual material.
- To improve learning of complex construction processes and operation of the rail system, since these concepts are difficult to explain theoretically.
- To involve students selecting the topics which audio-visual material is required in order to improve understanding.
- To involve students collecting material for BAUFERR.
- To learn basic railway terminology in English by students.
- To make a useful bilingual multimedia library for railway Professionals.

3. METHODOLOGY

BAUFERR is developed by students and teachers from University of Granada. The students are suggested looking for some videos about railways. These videos must be a complement to theoretic issues. Teachers and other participants in this project will select and classify the audio-visual material in order to upload it to BAUFFER.

On the other hand, the company “MARE INGENIERIA FERROVIARIA ALTERNATIVA” has filmed the railways manufacture, reparation and test processes.

4. DESCRIPTION OF BAUFERR

University of Granada provides teachers with an online platform (PRADO) that contains some teaching support tools as a teaching board. This online platform allows teachers to provide students with all the information for each subject.

They can access through the web of University of Granada (www.ugr.es), going to “Electronic Administration” and then “Identified access in-line services of the UGR (Virtual Office). All students have a user and password that are obtained when they register at the University for the first time, and they have access to information related to enrolled subjects.

Once students log into their account, a panel with different options is displayed, as in Figure 1. Clicking in “PRADO” and then “Tablón de docencia”, a new screen with all

register subjects is shown.

The screenshot displays the 'Acceso Identificado' (Identified Access) interface for the Universidad de Granada. The header includes the university logo and the text 'Acceso Identificado' with a lock icon. Below the header, there is a navigation menu with options: Inicio, Cambiar PIN/Clave, Contacto, Ayuda (?), and Salir (power icon). The main content area is titled 'Aplicaciones' and features a search bar and a table of application options. The table has three columns: 'Aplicación', 'Área', and 'Favorito'. The 'Favorito' column contains star icons, some of which are filled (indicating a favorite) and some are empty. To the right of the table, there are two notification boxes: 'Novedades' (No hay novedades) and 'Avisos' (No hay Avisos). At the bottom of the table, there is a pagination control showing 'Página 1 de 4' and 'Mostrando 1 - 16 de 55'. The footer includes the CSIRC logo and the text 'CENTRO DE SERVICIOS DE INFORMÁTICA Y REDES DE COMUNICACIONES', along with a 'Página segura' indicator and a lock icon.

Aplicación	Área	Favorito
Actas	Grado y Posgrado	★
Consulta de Nómina	Servicios	★
Incidencias y Averías	Trámites CSIRC	★
Listas	Grado y Posgrado	★
P.R.A.D.O.	Grado y Posgrado	★
Sistema de Seguimiento de Actividad Docente (SSAD)	Grado y Posgrado	★
Solicitud de Cuenta Personal de Correo Electrónico	Trámites CSIRC	★
Adquisición software	Trámites CSIRC	★
Alumnos IN	Movilidad	★
Apoyo a Docencia	Grado y Posgrado	★
Automatricula Enseñanzas Propias	Grado y Posgrado	★
Ayudas G.A.S.	Becas, Ayudas y Subv	★
C.A.P.	Por Determinar	★
Claves Aulas	Aulas de Informática	★
Comedores - Menú para llevar	Servicios	★
Comunicados Docencia	Grado y Posgrado	★

Fig. 1- Options panel of Identified access in-line

Next to each subject there is an icon that warns students of a new message from a subject.


In the upper part of the board there is a horizontal menu with different options. These options are: write a new message, see a message, check evaluations, create a directory and so on (Figure 2). Definitely it is a web tool that allows exchanging information between all course participants. Different means of communication can be used, as exchanging files, sending messages to forum and so on.




Usuarios Conectados: 3 profesores 3 alumnos

Curso Académico: 2013/2014

AYUDA

 Descripción del Servicio

 Asistencia Técnica



AVISOS

INFORMACIÓN ESTADÍSTICA

Accesos al Tablón de Docencia




CURSO	38.859 / 7.417 / 117
MES	38.859 / 117 / 232


Foro | Evaluación | Gest. de Alum. | Directorio | Configuración | Otros

Elija la asignatura y pulse sobre el icono correspondiente a la operación que quiera realizar.




Legenda:

-  Muestra información de la asignatura. |
-  Avisos sobre el directorio de docencia. |
-  Indica que existen nuevos mensajes o trabajos.

Pulse sobre  para ocultar o mostrar las asignaturas o cursos.

Asignaturas Primer y Segundo Ciclo

Teoría

<input type="radio"/> FERROCARRILES (E. CONSTRUCCIONES CIVILES)_237 (GRUPO A)	
<input type="radio"/> FERROCARRILES Y TRANSPORTE GUIADO (E.TRANSPORTES)_237 (...)	
<input type="radio"/> MOVILIDAD, TRÁFICO Y TRANSPORTE (GRUPO A)	

Prácticas




<input type="radio"/> FERROCARRILES (E. CONSTRUCCIONES CIVILES)_237 (GRUPO 1)	
<input type="radio"/> FERROCARRILES (E. CONSTRUCCIONES CIVILES)_237 (GRUPO 2)	
<input type="radio"/> FERROCARRILES Y TRANSPORTE GUIADO (E.TRANSPORTES)_237 (...)	

Fig. 2- Horizontal menu

In a subject directory, teachers can add some files and share with students. These files can be organized in folders.

The main object of this project is to create a bilingual audio-visual library in order to support students with learning some issues from Railway subject, by using the computer services from University of Granada. The subject directory is used for this and its appearance is shown in Figure 3 and 4.

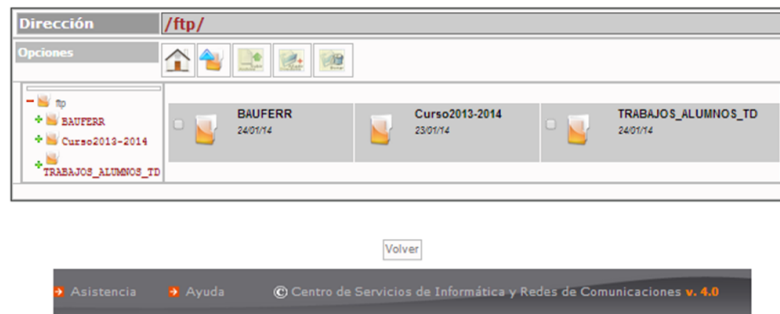


Fig. 2. Directory of subject.

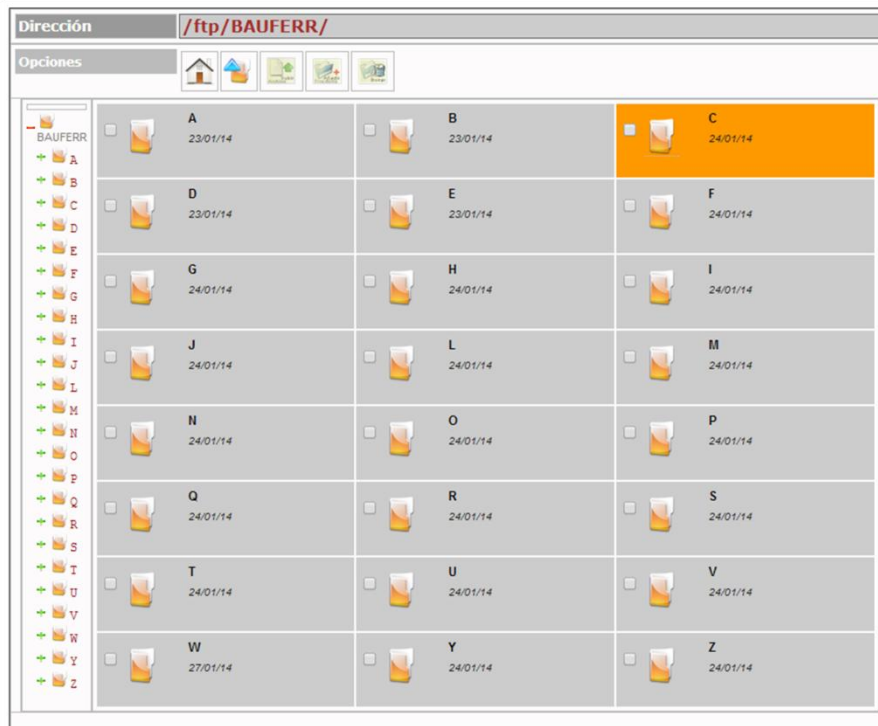


Fig. 3. BAUFERR folder.

5. HOW BAUFERR WORKS

In the Railway subject directory there is a folder called “BAUFERR”, which contains twenty-four folders inside. Each subfolder is called with a letter of the Spanish alphabet. In order to obtain a complete library, students are suggested looking for some videos that display many construction, operation or maintenance processes and support understanding the theoretical issues.

The videos can be downloaded from Internet as well as through the company that made these videos. Thus, students also contact with railway companies and they can find many job prospects.

The videos are identified with a name related to a theme. The videos are included in the appropriate folder according to the initial letter. Each video must be accompanied by a sheet file including keywords, a brief description of the video, author, date, and so on, in both Spanish and English. Figure 5 shows a prototype.

C	CAMBIADOR ANCHO TALGO-CAF/GAUGE-CHANGING INSTALLATIONS TALGO-CAF
Palabras clave	Cambiador, ancho, Talgo, CAF, interoperabilidad
Descripción	La tecnología de cambio de ancho de vía automático constituye un notable éxito en España, superando así el problema español de contar con dos anchos de vía diferentes. Desde 1969, más de 300.000 trenes han cambiado de ancho a través de las instalaciones de cambiadores automáticos. Más de 50 trenes de alta velocidad, tanto de tecnología CAF como de TALGO, cambian de ancho todos los días, conectando las líneas de alta velocidad con la red convencional. El último programa de investigación subvencionado por Adif en este área es el "Cambiador de ancho TALGO-CAF". Se trata de un cambiador de ancho que optimiza drásticamente la infraestructura.
Keywords	Changer, width, Talgo, CAF, interoperability
Description	The automatic gauge change system is a complete success in Spain, overcoming the problem of having two different gauges. Since 1969, more than 300000 rail vehicles changed (have been changing) the axle wheelbase automatically over a special assembly located on tracks with a different gauge. Every day, more than 50 high speed trains change the axle wheelbase in order to connect the French-Spanish border. The last research program funded by ADIF in this area is the "gauge changer Talgo-CAF". It is a gauge changer that optimizes the infrastructure dramatically.
Nombre del archivo/File name	Cambiador de ancho / Gauge-changing installations
Autor/Author	ADIF, Dirección de Comunicación y Relaciones Externas.
Fecha subida a la red/Uploading data	08/03/2011
URL	http://www.youtube.com/watch?feature=player_detailpage&v=y8N7Ikw87tM
Duración. Tipo de archivo. Tamaño/Video length. File type. Size	4:25. MPEG-4 Movie. 12,8 MB

Fig. 4. Sheet file.

This sheet file reflects the bilingual character of BAUFERR. Thus, students are able to learn basic railway concepts in English and it could allow improving their job prospects in foreign countries.

According to the quality of the material in the directory, teachers review it before uploading to the directory. The contents and affinity with subject are checked. If the video is correct, the teacher ask student to elaborate the corresponding text file. Once teacher has received the video and the text file, it is uploaded to the directory. From that moment, students would be able to visualize both the video and the corresponding text file. Figure 6 and 7 show the organization of the directory.



Fig. 5. Folder for letter "C".



Fig. 6. Subfolder with audio-visual material.

6. FUTURE WORK

This Audio-visual Library in the Teaching Directory is the first stage to create a site that will allow teachers and students worldwide sharing information related to railways.

As future vision, the creation of a website is expected. The website will content a blog where students could present questions or post some comments about railways. Theoretic material could be uploaded and additional readings could be proposed.

Moreover, due to the information from the web might be missed over time; an interactive DVD would be recorded once a year, including all information available in that moment.

Thus, the audio-visual material will be available without Internet and, on the other hand, a thematic railway collection will be accomplished.

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REFERENCES

http://www.glue-it.com/trains/glos_frm.html

<http://trn.trains.com/en/Railroad%20Reference/Railroading%20Glossary.aspx>

<http://www.railway-technical.com/newglos.shtml>

<http://www.ugr.es>

JIMÉNEZ DEL BARCO, L and GARCÍA, M^a DEL CARMEN (2012). *Innovación docente y buenas prácticas en la Universidad de Granada*. Editorial Universidad de Granada.

JIMÉNEZ DEL BARCO, L and GARCÍA, M^a DEL CARMEN (2013). *Innovación docente y buenas prácticas en la Universidad de Granada*. Editorial Universidad de Granada.

LEÓN, MARIO (2005). *Diccionario de Tecnología Ferroviaria*. Editorial Díaz de Santos.

MARE INGENIERIA FERROVIARIA ALTERNATIVA. *<http://www.mare-ingenieria.es/>*

STUDENTS OF RAILWAY SUBJECT OF CIVIL ENGINEERING DEGREE. *Class works. Courses 2013/14 and 2014/15.*