



AulaWeb: a B/E-Learning platform in UPM

Raquel Martínez - Ángel García

*Escuela Técnica Superior de Ingenieros Industriales
Universidad Politécnica de Madrid*



Summary



1. What is AulaWeb?.
2. Pedagogical scenarios on AulaWeb
 1. B-learning: B-Learning with engineering students in Computer Science Courses
 2. E-learning: The statistical module of AulaWeb: A tool for improving e-learning quality
3. Conclusions



1. What is AulaWeb?



Student Inf



Information



Resources



Activities



Communi
cations



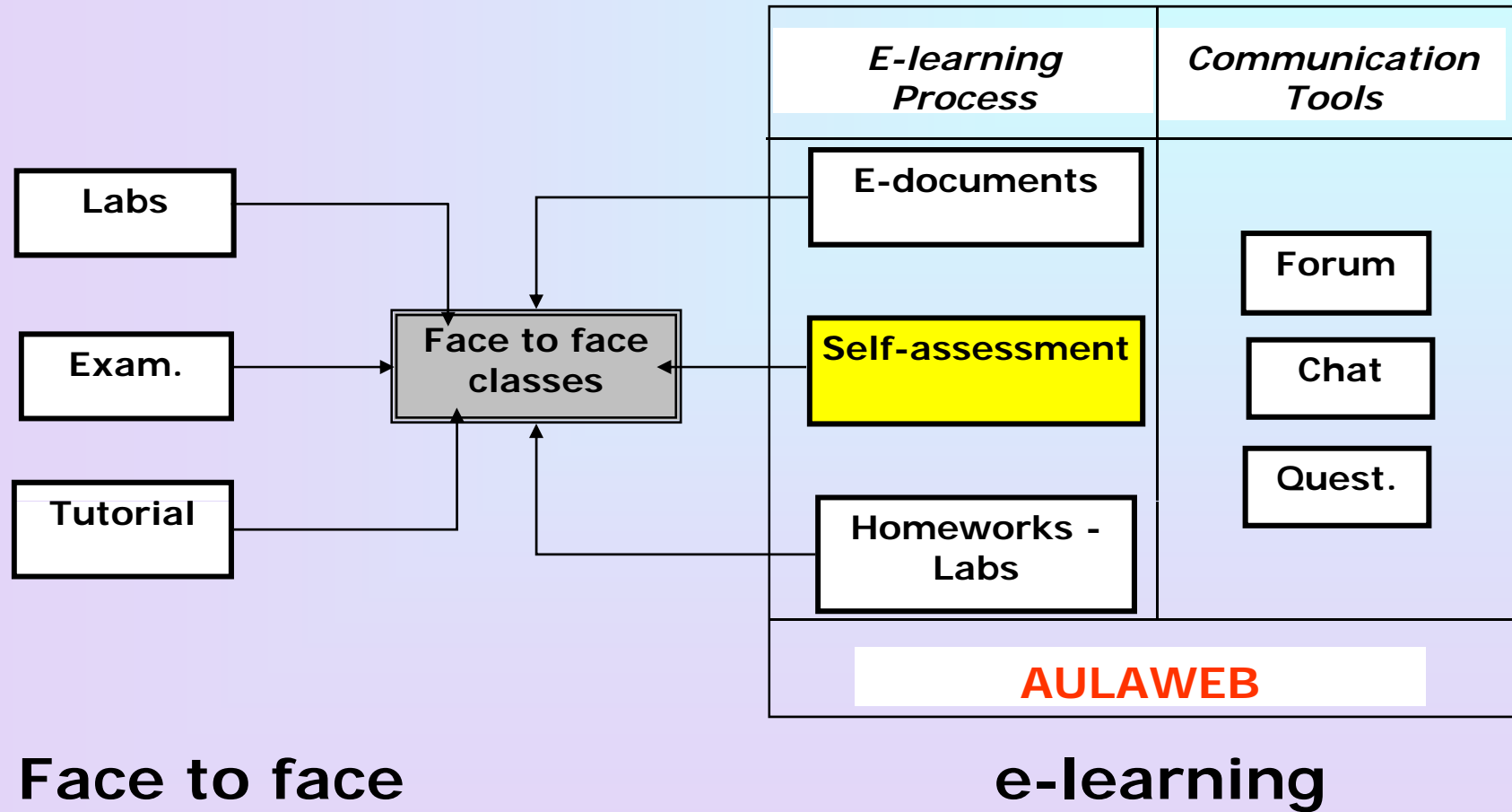
Exit

- WWW-based course-support system
- Valid for all kind of courses and subjects
Specifically CS Department:
**Computer Science, Information Technologies,
Java Programming, C/C++ programming, Object
Oriented Programming**
- Easy GUI & no programming required
- Essential functions for interactive teaching-learning
(only) through WWW
- Password authentication & users management
- On-line graphic assistance to **publish contents**
- On-line ***collect & deliver*** homeworks
- **Self-assessment system** with test configuration
including (random and/or multimedia) questions from
the database
- Chat room and **forums**
- **Access data statistical processing**





2.1 Pedagogical scenario: b-learning

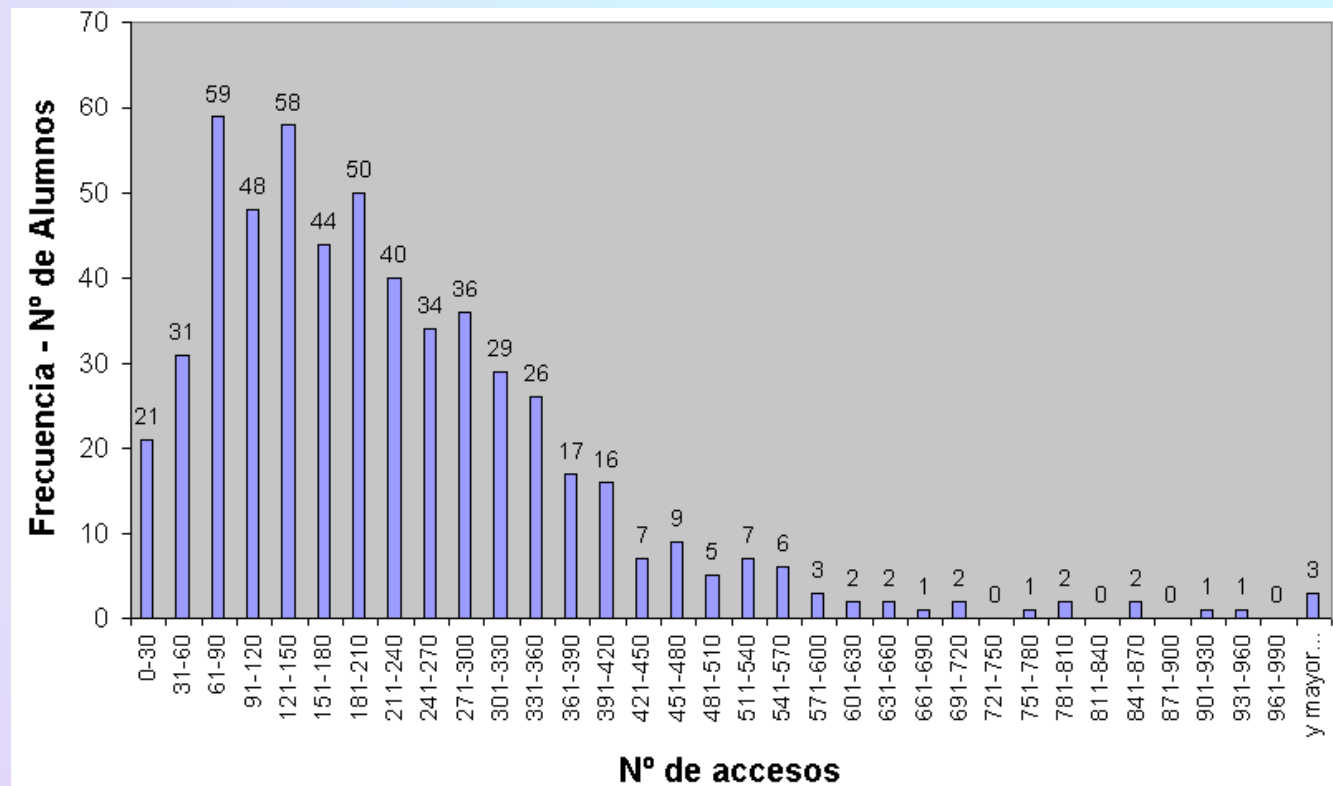




Access to AulaWeb by CS students



Statistical Measure	Course 2004-05	Course 2005-06
Average	226,82	180,85
Median	191	155
Standard Deviation	173,71	125,10
Kurtosis	12,05	2,98
Asymmetric Coefficient	2,410	1,40
Range	1704	850
Minimum	0	0
Maximum	882	850
Sum	127705	95130
Size	563	526



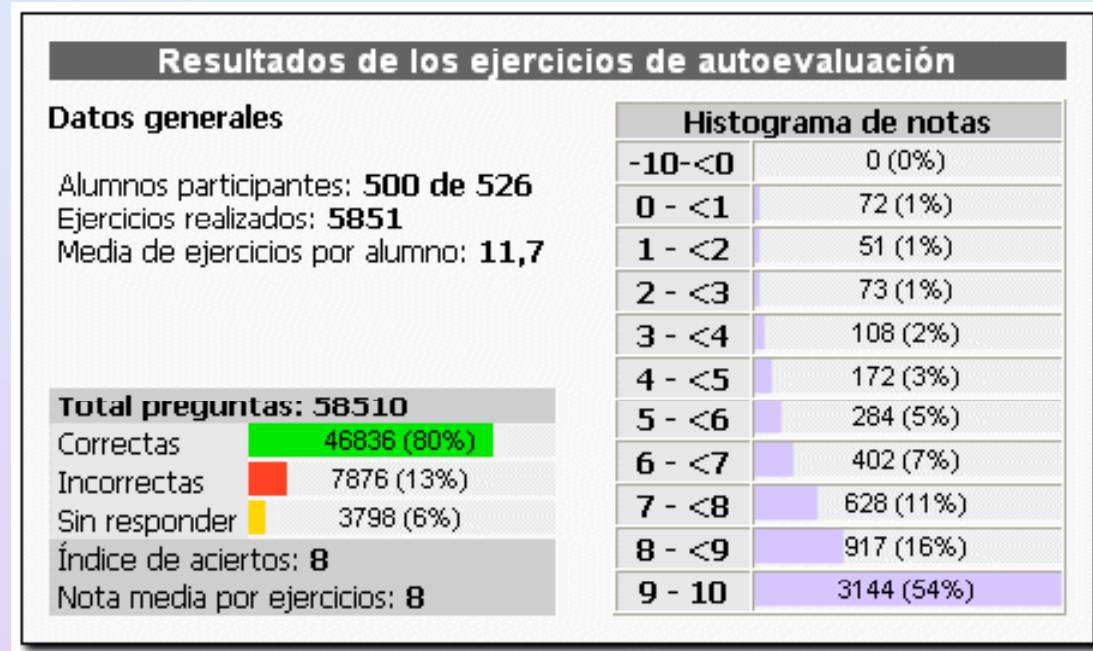
Number of access to AulaWeb by CS students during the first term (2005-06)



Self-assessment module



- 11 Chapters
- 1 self-assessment exercise per chapter
- TurboPascal code questions are a powerful tool
- In CS subject, first semester in 2005-06
 - ❖ 500 students did
 - ❖ 5851 SA exercises with
 - ❖ 58510 questions
- **We didn't correct any question !!!**





TurboPascal Code questions



Virtual environment programming (Borland type) with a Java Applet !!!

Virtual Compile & run functions

We compare results with the correct ones

Enunciado

Completar la función `trazas` para que devuelva el valor de la **suma de los elementos de la diagonal secundaria** (traza secundaria) de una matriz NxN de valores reales dada como parámetro de la función.

The screenshot shows a TurboPascal IDE window titled "PREGUNTA-1.PAS". The code is as follows:

```
const N=20;
type indice=1..N;
      matrizNxN=array[indice,indice] of real;
function trazas (matrizNxN:matrizNxN):real;
begin
  { Escribe aquí el código de la función }
  var aux:real;
  begin
  { Escribe aquí el código de la función }
  aux:=0;
  for i:=1 to N do
    trazas:=aux+matrizNxN[i,N-i+1];
  end;
end;
```

The IDE shows the "Ejecutar" button highlighted in green. A dialog box displays the execution output:

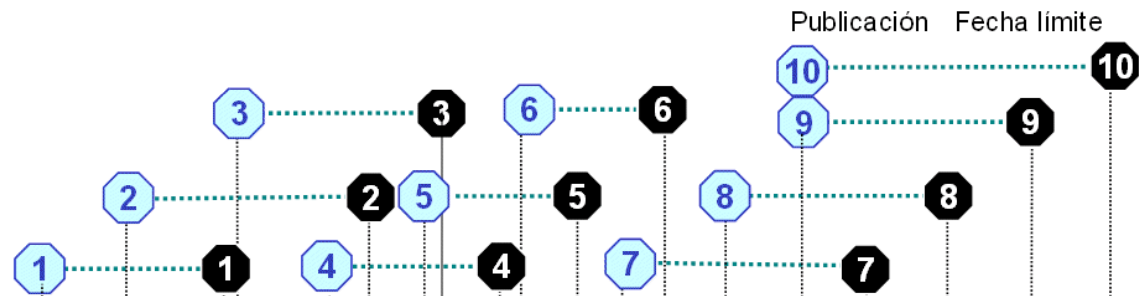
```
EJECUTANDO...
OK: Programa ejecutado
La funcionalidad parece correcta
```

At the bottom of the IDE, it says "8:2" and "Campo de código a rellenar (1 de 1)".

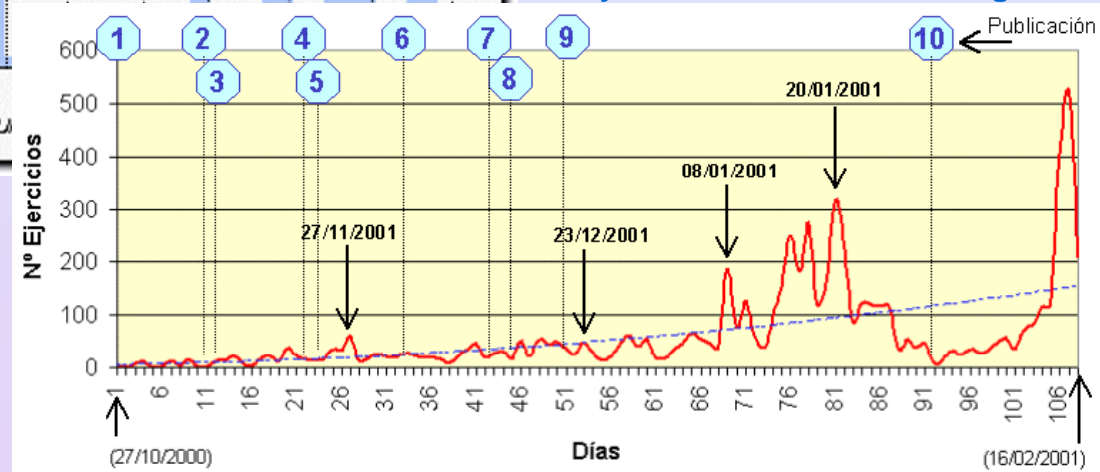
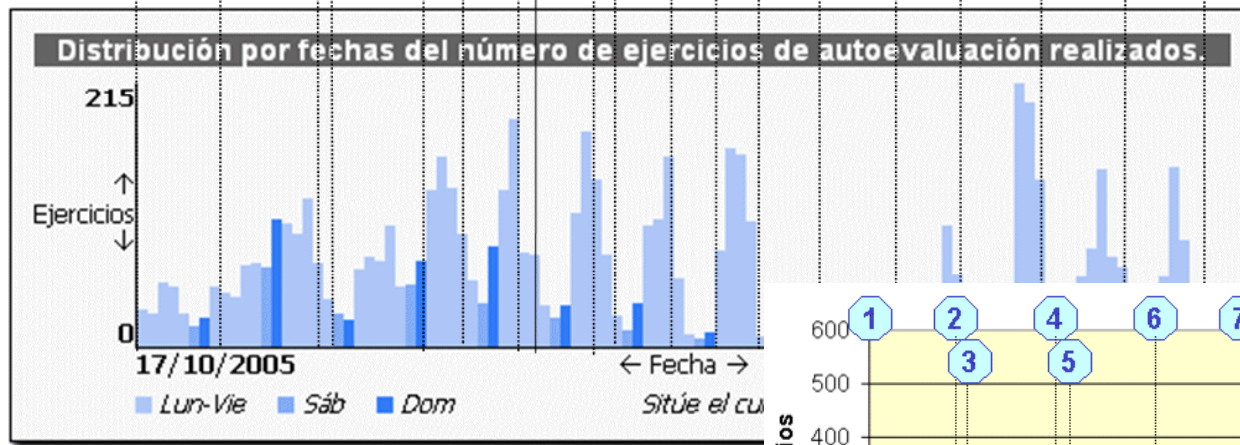
An on-line compiler is needed for processing this type of questions



Self-assessment methodology

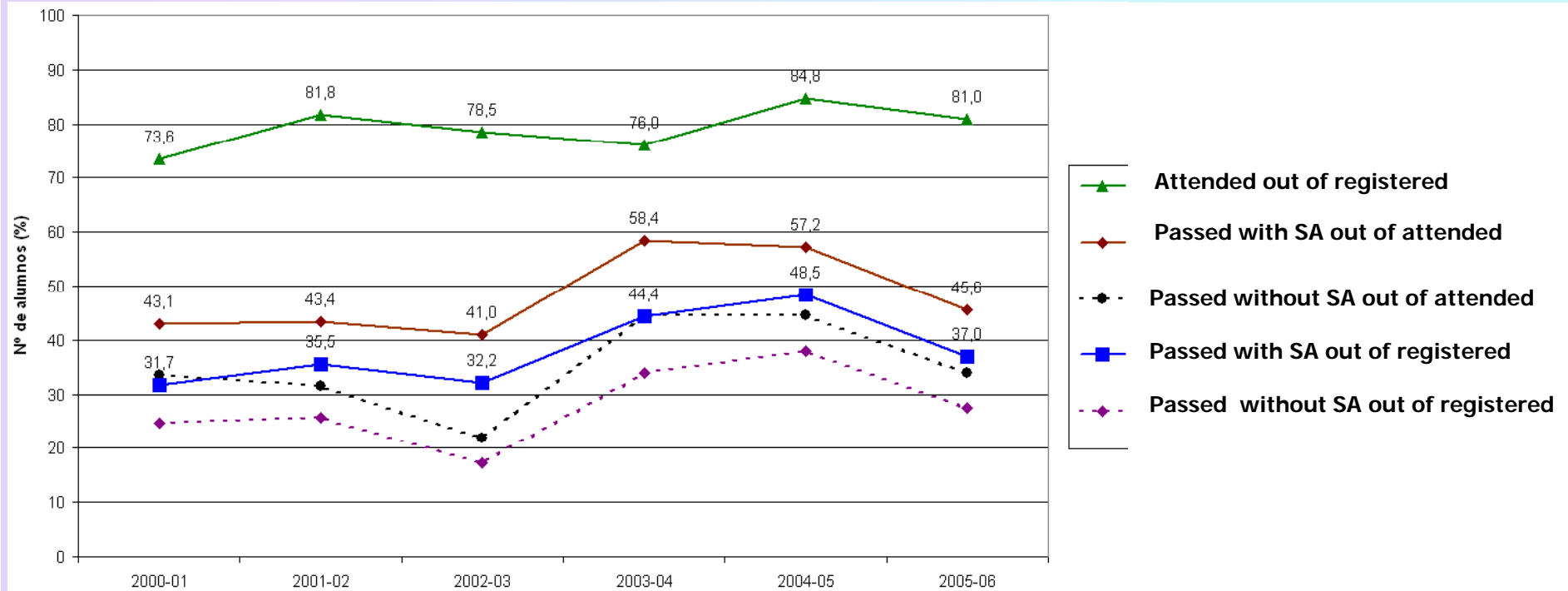


- Questions have appeared on previous exams
- Contribution to the subject grading
- Turbo pascal, C, Java questions
- A fixed deadline for every exercise
- Deadline every week
- Two weeks for delivering every exercise
- 10 questions in every exercise
- Students can repeat a exercise
- They can increase their average mark





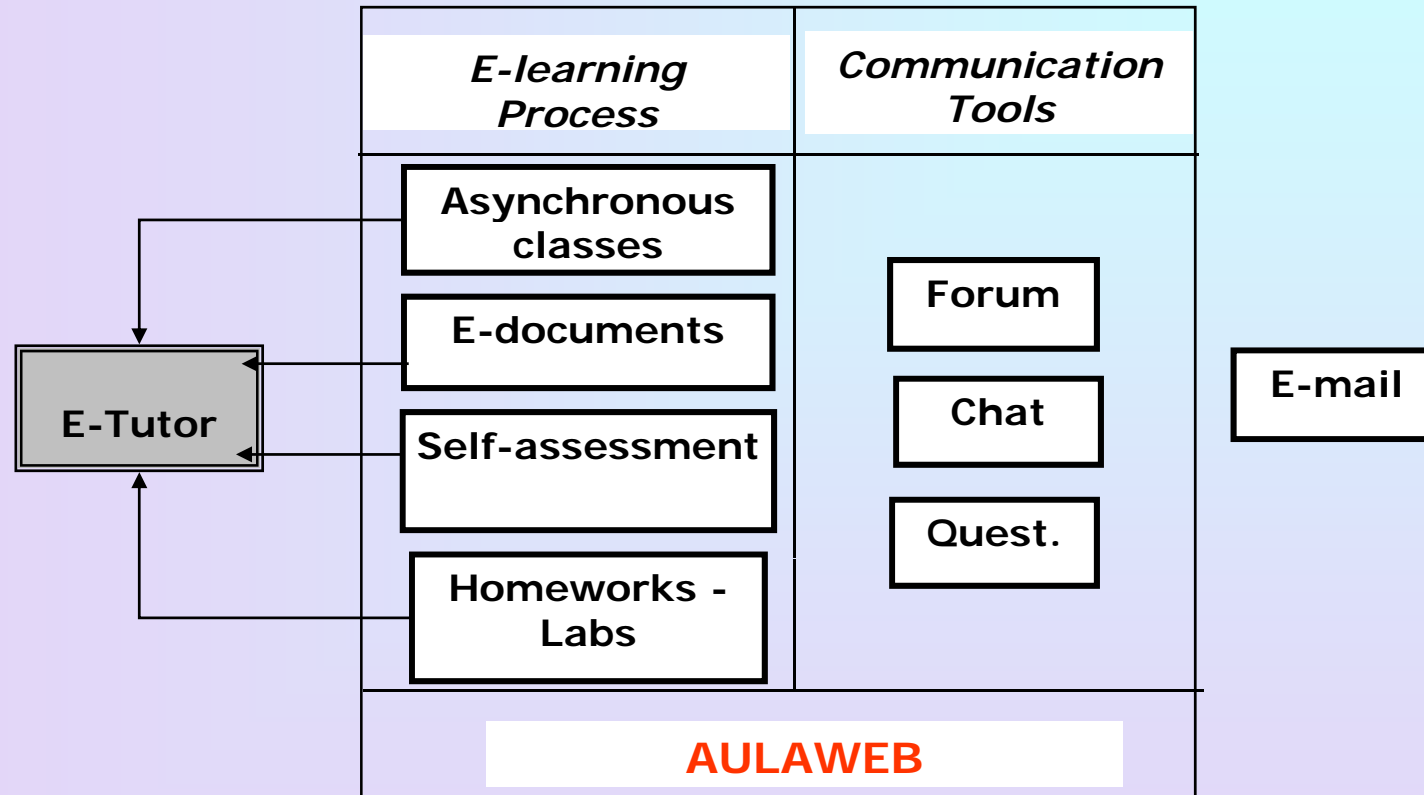
Self-assessment improves results?



Effects of self-assessment on the number of successful results on CS topic during the last six years



2.2 Pedagogical scenario: e-learning



e-learning

Information Technologies and Java Programming modules



The IT and JP activities



❖ Review a lesson per week in the **Curso online** section asynchronous classes

- ❖ Read e-documents
- ❖ Do a **self-assessment exercise** every one or two weeks
- ❖ Do **homework** every two or four weeks
- ❖ Participate on **optional chat** every week
- ❖ Participate on **obligatory chat** some week (4)
- ❖ A **final collaborative work** on groups





The minimum requirements in e-learning



IT and JP Documentation published on AulaWeb:

30 html documents including 164 jpg images for every *Curso on-line in SCORM format*

We need to know:

- If all the nodes are visited
- When a node is visited
- Who has abandoned the course
- Who hasn't visited a node
- The course tracking of a student
- Compare a student with the average

The screenshot shows a web browser window with a course tree on the left and an HTML introduction page on the right. The course tree lists 10 main topics: 1. Networks and Internet, 2. Basics of HTML, 3. Text Format and Lists, 4. Images and Links, 5. Images Maps and Tables, 6. Forms (Part I), 7. Forms (Part II), 8. Frames and Applets, 9. Cascade Style Sheets, and 10. Basics of JavaScript. The HTML introduction page is titled "HMTL Introduction" and contains sections for "Definitions", "Features of HTML Language", and "What is HTML Markup?".

HMTL Introduction

Definitions

- **SGML (Standar Generalized Markup Language)**: an international standard for electronic document exchanged. It describes a markup languages.
- **DTD (Document Type Definition)**: formal specification of language. The authoritative source for information about HTML and the HTML DTD is the World Wide Web Consortium (W3C) at <http://www.w3.org>. The World Wide Web Consortium is a not-for-profit organization that coordinates the evolution of the Web.
- **HTML (Hyper Text Markup Language)**: a format or "language" a subset of SGML to create a text file that allows to define a links from this location to new location within the same page or to a new page altogether forms multimedia objects.

Features of HTML Language

- An HTML file is a text file containing small **markup tags**
- The markup tags tell the Web browser **how to display** the page
- An HTML file must have an **htm or html** file extension
- An HTML file can be created using a simple **text editor**

What is HTML Markup?



Statistical Module GUI professor



Curso online Recursos Comunicaciones Asignatura

Estadísticas sobre los cursos online en el curso académico: 2005-2006

Tipo de información	Alumnos	Periodo	Agrupación / Tipo de gráfico
<input checked="" type="radio"/> Número de visitas <input type="radio"/> Tiempo de visita <input type="radio"/> Duración de las visitas <input type="checkbox"/> Acumulativa	<input checked="" type="radio"/> Todos los alumnos <input type="radio"/> Un alumno <input type="radio"/> Un alumno y la media Seleccione un alumno	<input checked="" type="radio"/> Curso académico completo <input type="radio"/> Mes del curso: Abril-2006 <input type="radio"/> Intervalo: Inicio: / / Fin: / /	Seleccione una agrupación Gráfico: <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Mostrar Restablecer

ÁRBOL DE CONTENIDOS

- CURSO COMPLETO
 - 1. Networks and Internet
 - 1.1. Networks: Basic concep...
 - 1.2. Networks: Networks Top...
 - 1.3. Networks Protocols
 - 1.4. The Internet
 - 1.5. Services
 - 2. Basics of HTML
 - 2.1. HTML Introduction
 - 2.2. HTML Page Creation E...
 - 2.3. Headings, Paragraphs B...
 - 3. Text Format and Lists
 - 3.1. Format Pages
 - 3.2. Lists
 - 4. Images and Links
 - 4.1. Images

Obtención de la estadísticas

La página actual permite obtener de modo sencillo toda la información que desee sobre el uso del curso online de la asignatura.

En primer lugar seleccione en el **Árbol de contenidos** la unidad, tema o capítulo sobre el que desea realizar la consulta. Después, elija en el formulario los siguientes campos:

- Tipo de información requerida
- Alumnos consultados
- Periodo temporal sobre el que realizar la consulta

A continuación habrá de elegir la agrupación, apareciendo seleccionado por defecto el tipo de gráfico más explicativo, si bien podrá cambiarlo si lo desea.

* Si se habilita la opción **Acumulativa** y la selecciona podrá observar cómo se han ido acumulando los datos obtenidos a lo largo del periodo temporal elegido.

Finalmente pulse el botón **Mostrar** para ver el gráfico deseado.

17:14 Curso Académico 2005/06 Profesor: RAQUEL MARTÍNEZ FERNÁNDEZ (Profesor administrador) ID: raquem

Miniaplicación Solapas started Internet



Parameters of Statistical Module



Information type

Number of visits
 Visit date
 Duration of visits

Accumulative

Different information types

Students

All the students
 One student
 One student and the average

Seleccione un alumno

Several levels of clustering and detail

Period

Complete academic course

Mes del curso:

Intervalo: Inicio..... / /
Fin..... / /

Date interval

Clustering/Graphic type

Seleccione una agrupación

Gráfico:   

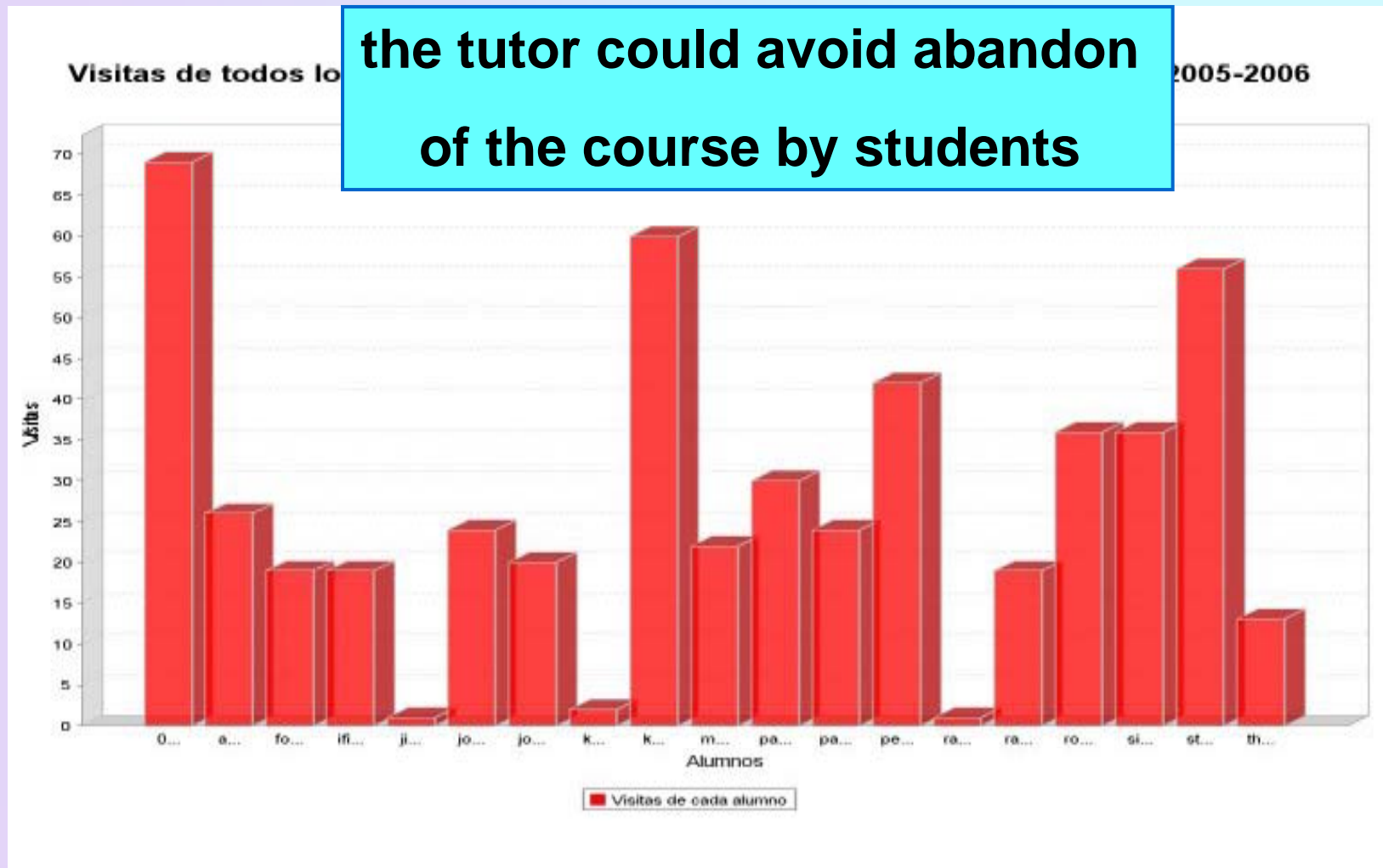
Different criteria of grouping data. Three types of graphics



Bar Diagram

Number of hits of all students during the whole course

the tutor could avoid abandon of the course by students

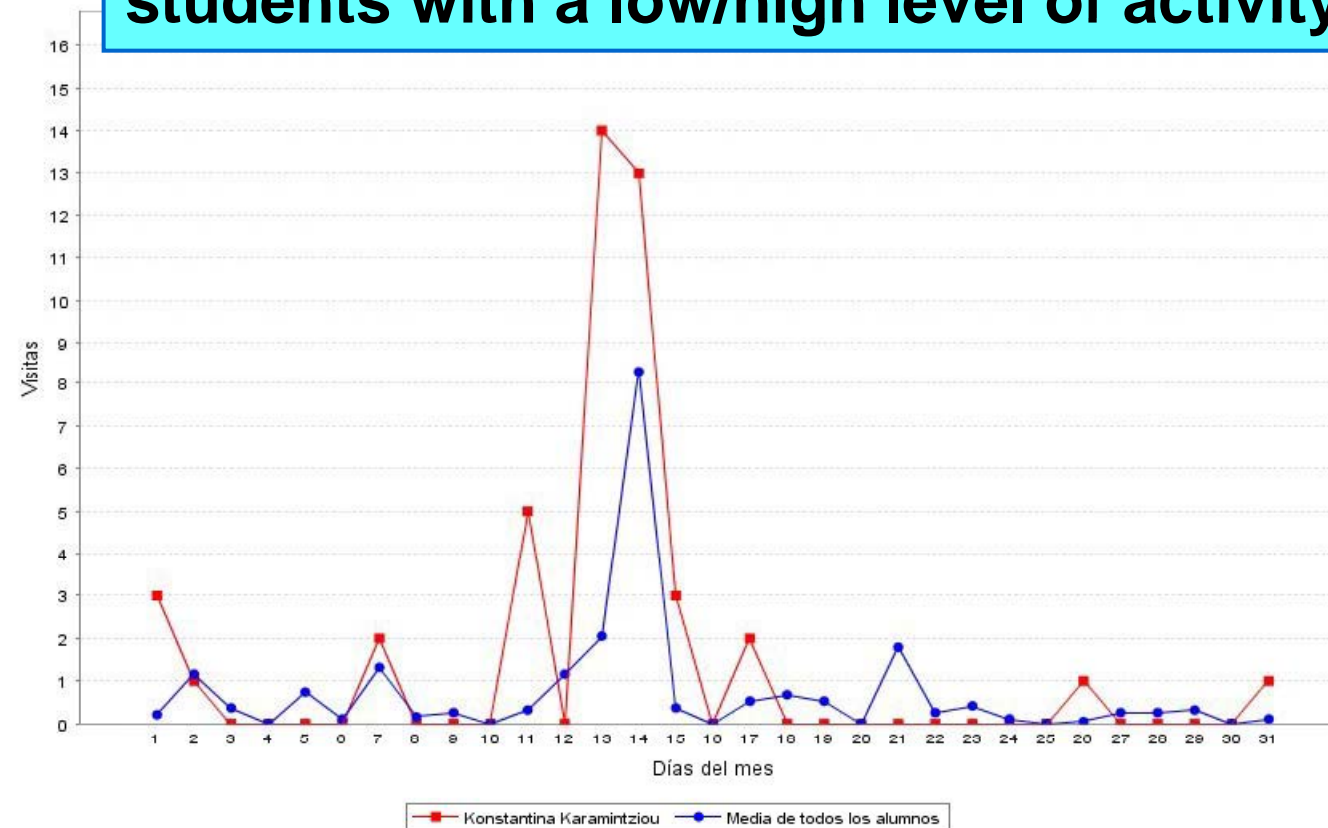




Line diagram

Number of visits of a student vs the average

**the tutor can identify
students with a low/high level of activity**





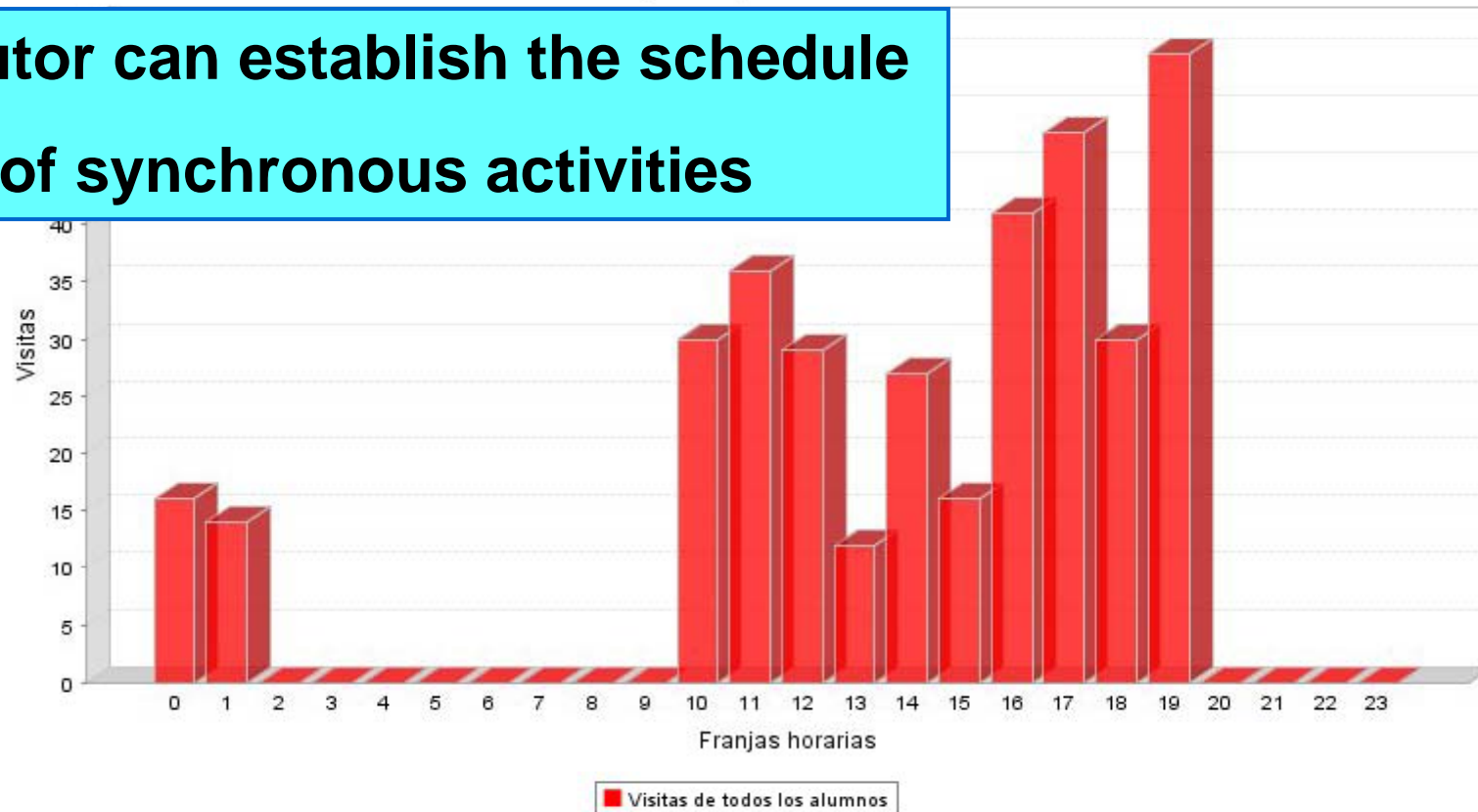
Bar Diagram

Number of hits of all students during the whole course grouping by time slots in a day

Visitas de todos los alumnos al CURSO COMPLETO durante todo el curso 2005-2006

Distribución de visitas por franjas horarias. Visitas totales: 354

**The tutor can establish the schedule
of synchronous activities**

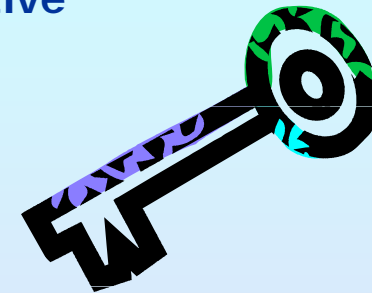




3. Conclusions

- Academic staff acceptance of e-learning platforms is positive
- AulaWeb is used on b-learning as a tool to publish e-contents, to collect&deliver homeworks, to do self-assessment evaluation
- Self-assessment module helps students to realize progressively his level of knowledge
- Self-assessment module allows the teacher to track the students' progress during the course

- Statistical Module in AulaWeb together with e-content in Scorm format of *Curso online* improves the performance of online courses
- SM allows to know the real use of the platform by students.
- SM helps to analyse the use of a specific resource or activity.
- SM focus on the improvement of the course contents on a more efficient way
- SM allows to know the student connection habits to improve them.





Questions?



- Contact

Raquel Martinez

*Computer Science Department - Universidad
Politécnica de Madrid*

E-mail: raquelm@etsii.upm.es