

# SIGMA AIE OFFERS TO FACULTAT PERE TARRÉS THE MOODLE LEARNING PLATFORM, INTEGRATED WITH ACADEMIC MANAGEMENT SYSTEM FOR TEACHERS IN SOFTWARE AS A SERVICE (SAAS)

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## Abstract

One of the current challenges of many universities is to break the barrier between the world of academic administration and the world of new learning platforms.

SIGMA has been working to eliminate this barrier and provide a number of services in the Moodle virtual platform that enables academic management and virtual campus work together.

SIGMA currently offers to Facultat Pere Tarrés the two environments in SaaS model, maximizing the information contained in the academic management system in an efficient mode that is convenient for teachers and students.

This integration ensures automatically creating Moodle courses from the groups defined in the syllabus and assignment of the teacher, so that, upon completion of the university enrollment periods, all courses are available in Moodle platform with teachers and students enrolled.

In the teacher's Moodle workspace we created a number of utilities that allow the teacher to interact with the academic management application directly from Moodle without opening a new session in SIGMA SIS. These utilities allow the teacher to:

- Check the class lists
- Check student records
- Enter final grades in SIGMA SIS
- Manage records

In addition, we have developed a component that allows the teacher to pass the final grades recorded in Moodle directly to SIGMA SIS, linking the daily assessment tool with the academic administration tool.

**Keywords:** Sigma, SaaS, Moodle, learning, integration.

## 1 SIGMA GESTIÓN UNIVERSITARIA CONSORTIUM

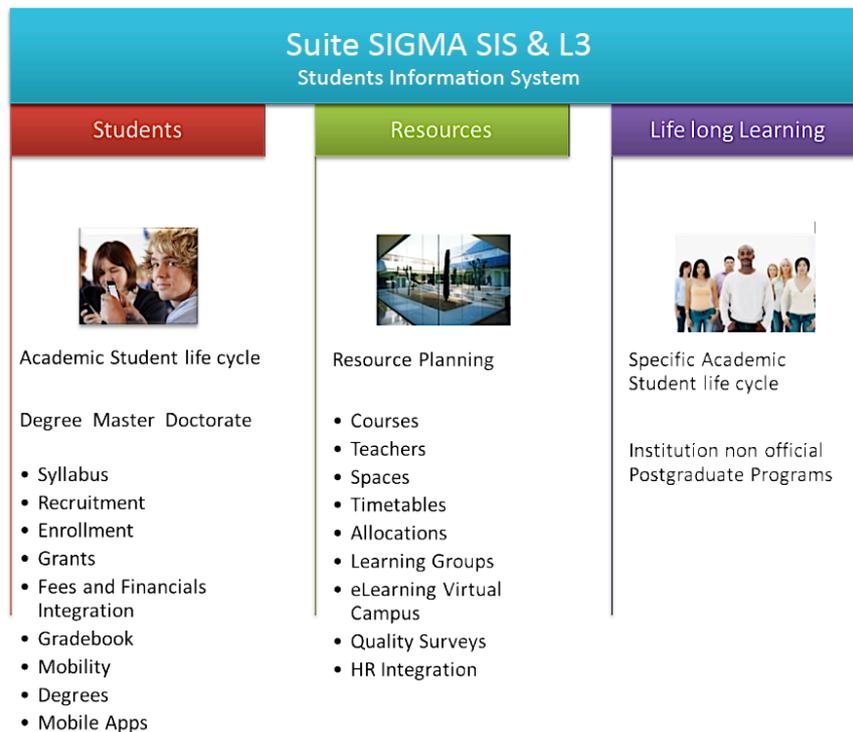
SIGMA Gestión Universitaria [1] is a nonprofit consortium established in 1996 by a group of 8 top level Spanish Public Universities to provide technological solutions to their needs for managing academics, learning, research and organization processes. SIGMA represents 20% of the students in the Spanish university system. The consortium's objective has evolved towards the continuous technological modernization of university management through the development of IT solutions aimed at automating the administrative processes and, as a result, guaranteeing their effectiveness.

Technology and innovation are the backbone of the services and solutions provided, based on a highly open source development and deployment platform for J2EE5 certified application servers compliant on a multi-tier and high performance proven open architecture. Internationalization is also one of SIGMA's top priorities. For years, SIGMA has established relationships with other European university consortiums. Lately, SIGMA has open new strategic areas of interest such as SaaS, BI, eLearning and Mobile. SIGMA focuses the development and support of two main suites of solutions:

- SIGMA SIS (Student Information System)
- SIGMA CRIS (Current Research Information System)

## 1.1 SIGMA Student Information System

The European Higher Education Area (EHEA) was created to construct the Europe of Knowledge and place it at the international forefront, in order to benefit mobility and employment opportunities, and also to unify higher education studies in the EU. Since then, one of the main priorities of SIGMA [1] has been the adaptation of its products and services to the requirements of the EHEA, thus assisting the universities in the group as they go through this important transformation process.

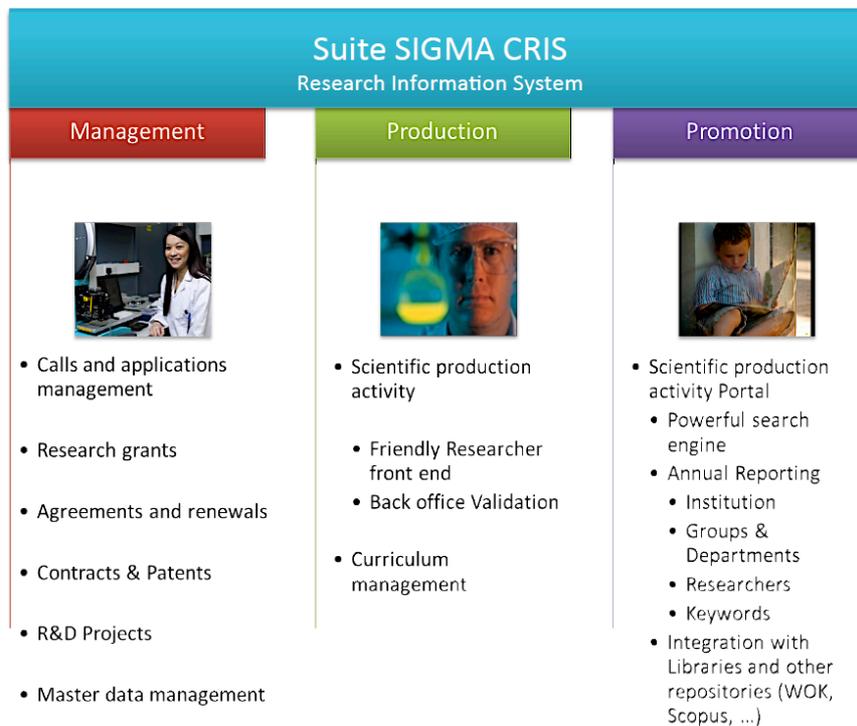


**Fig. 1. Suite SIGMA Students Information System**

## 1.2 SIGMA Current Research Information System

The European Research Area (ERA) [2] was created to facilitate the mobility of researchers, attract the best world researchers and coordinate the national and regional programs. Since then, SIGMA [1] has incorporated in its products - adaptations and new functionalities to support the scientific activity as well as its promotion, and has aligned its ARGOS Research Project with the ERA requirements.

Sigma is also aware of the new research trends (mobile devices, EuroCRIS Common European Research Information Format – CERIF [3] initiative, unique author identifier studies (i.eiraLIS [4]), altmetrics [5], ...) through continuous studies and the experience provided by the joint collaboration with the universities that compose the consortium.



**Fig. 2. Suite SIGMA Current Research Information System**

## 2 CLE - COLLABORATIVE LEARNING ENVIRONMENT

Since 2009 SIGMA has begun to focus efforts on different learning platforms. While the SIGMA SIS suite offers a variety of tools without which the university could not make their efforts, they still continue to be administrative and dedicated tools mainly to control monitoring and development of their academic student records as well as the definition of the teaching plan.

Tools that, for both student and teachers, are of rapid use compared to the tools they use during the day. These tools are called learning platforms such as Moodle [6], Sakai [7], etc. Based on this, we began to analyse what could make the SIGMA system in this platform. The first thing that caught our attention was the amount of repeated information that had two environments. All users, both students and teachers who are enlisted in Moodle also are registered in SIGMA and the courses offered in these virtual classrooms are in most cases, the same definition of groups that have in the distribution of enrolment.

With all this, SIGMA developed two parallel projects. The first project was the creation of an interface for any learning platform than can feed their databases of information contained in SIGMA and, secondly, another branch of work was opened on merging functionalities between the two platforms so that teachers and students do not have to switch between platforms environments depending on what they need to do. The area's target is to create a series of services and integrations that enable the learning platforms such as Moodle, total interaction and communication with the SIGMA environment so that the teacher does not need to leave the Moodle environment to access information contained in SIGMA SIS.

There are two levels of integration:

- **Level I: Data Integration**
  - Creating a data interface that allows external systems to obtain a minimalist version of the SIGMA SIS data model.
  - Creating a synchronization process between the interface and learning platforms.
  - Creating a set of Web services that enable learning platforms the return of information, such as grades.

- **Level II: Functional Integration**

- Giving access to SIGMA functionalities, directly from the learning platform.
- Creating a delegated identification system for total transparency of this integration.
- For frequently used modules, creating plugins on the learning platform, that allows these modules to log in at SIGMA information. For example, a lite version of the SIGMA gradebook.

## **2.1 Data Integration**

The main objective of CLE is the integration of data between the two platforms, thus saving time and money by IT department of the university.

### *2.1.1 From SIGMA to Moodle*

The main idea of integration is sending data to take advantage of all the information already contained in SIGMA SIS. We defined an interface which retrieves the most relevant data reported in SIGMA on the current course, and turns to a system to make this information accessible and easy to export. To do this, we have created a series of processes. These processes update daily all information in the interface. This interface has specific modules for different learning platforms and is divided into 3 main points.

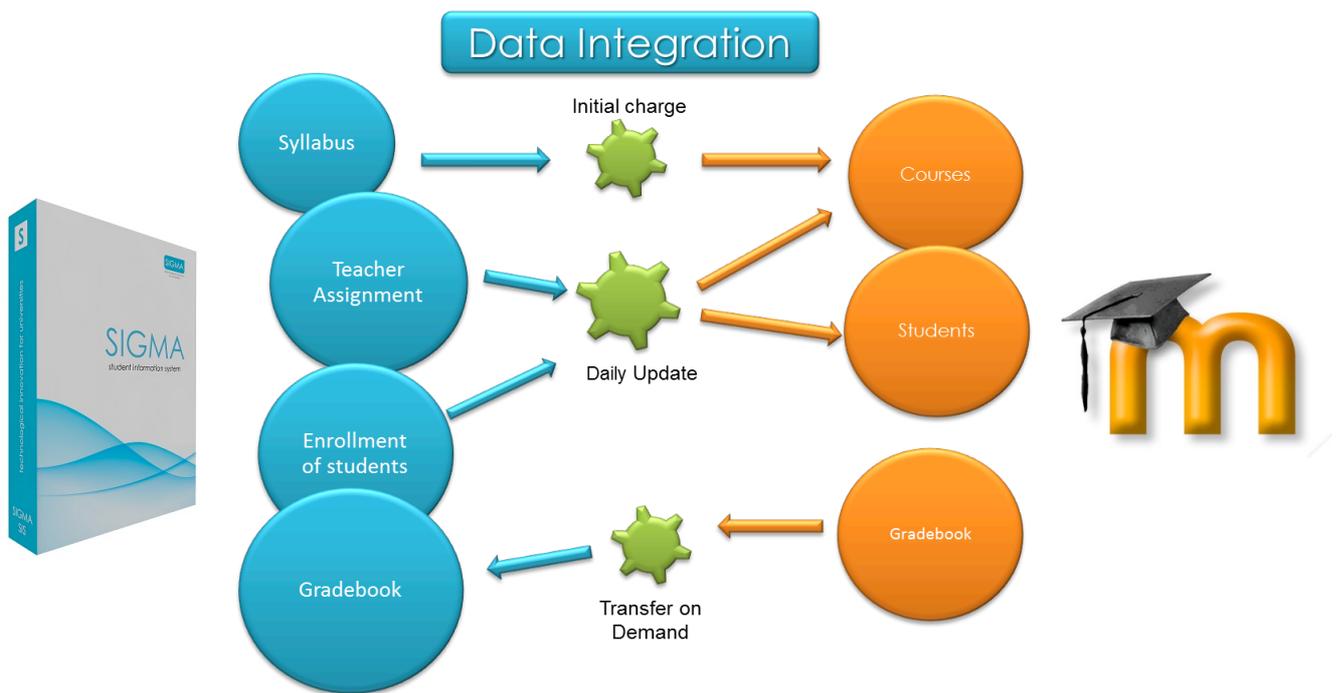
- Initial charge of the entire syllabus definitions in SIGMA, thus creating the necessary courses in e-learning platform.
- Daily load distributions of teachers in their groups, as well as the creation of new groups of enrolment.
- Enrolment and unenrolment of students to courses.

At this time, we have a system that ensures that every day, our platform is synchronized with SIGMA, ensuring student access the day after their enrolment to their virtual classrooms and purging of students that have to unenrol.

### *2.1.2 From Moodle to SIGMA*

It is important to send the information from SIGMA to the learning platform, as well as to send the information from the platform to SIGMA. Teachers currently put their notes in Moodle to keep the student informed of their notes in a convenient and fast way. So far, the teachers at the end of course have to take this information and pass it manually to the student information system. One of the latest developments in SIGMA is creating a tool that allows the teacher to pass the students' grades directly to SIGMA, with just one click.

After making these integrations, we obtain a picture like this:



**Fig. 3. CLE Data Integration**

## 2.2 Functional Integration

After the integration of data, the next step is the functional integration. At present, teachers and students are accessing to e-learning platforms for their daily work. And, when they need to access some data from SIGMA, (as the list of class, student records, etc.) they must leave the Moodle environment, and go to academic management environment where unless you have a Single Sign On system, they have to re-login.

For this reason, the best option for the convenience of the teacher is to create a system that allows you to access the SIGMA SIS options directly from Moodle without leaving it or having to login again.

The SIGMA applications were modified so they could be called from the outside. And, identification protocols for Moodle and Sakai were created. Finally, you get full access to SIGMA options from Moodle, as shown in next picture:

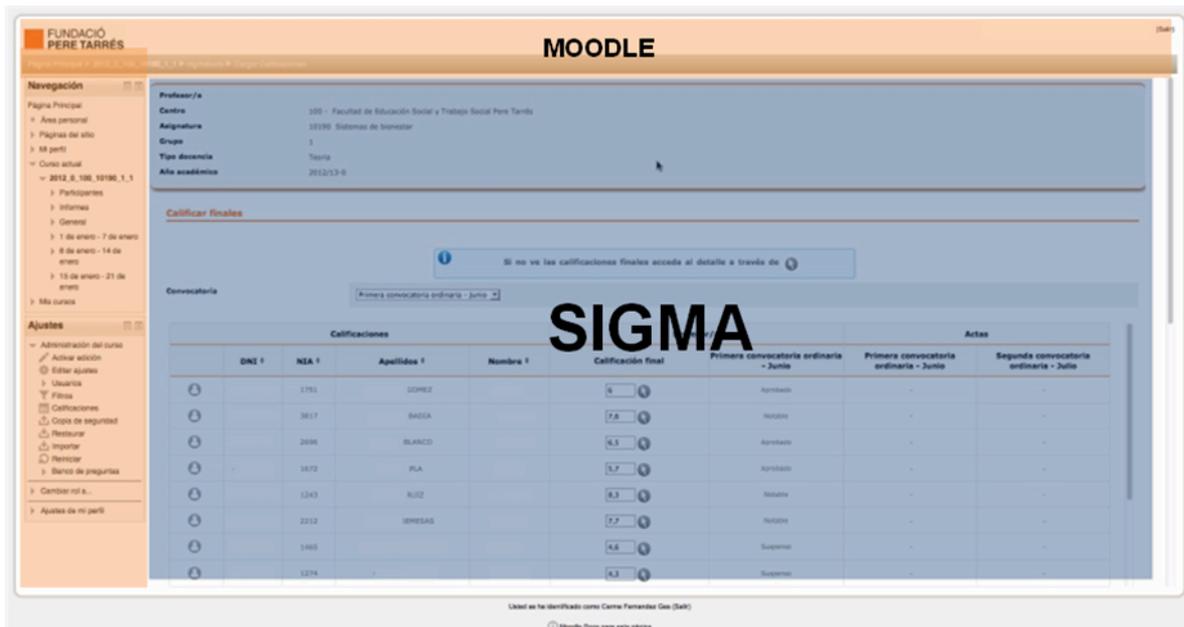


Fig. 4. CLE Functional Integration

Later on, these integrations were extended to compensate students. As a first application, we used the web surveys. Today, we continue integrating new functionalities and, in more complex cases, we create Moodle plugins to have a greater level of interaction that simple integration can give.

This way, we want students and teachers to not have the need to access SIGMA SIS other than the platform on which they are accustomed to work daily. Obviously, we are speaking in terms of e-learning activities, other activities for students like fees and financial data or research information for teachers, are managed in SIGMA SIS and SIGMA CRIS systems.

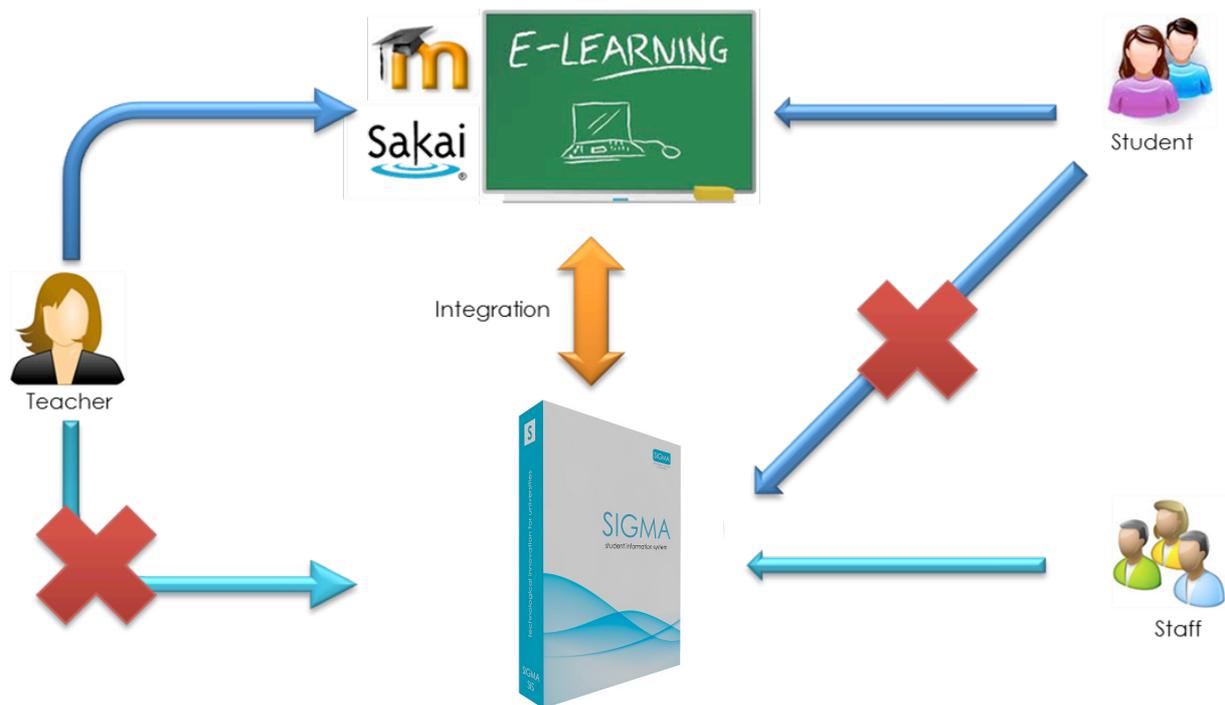


Fig. 5. CLE Full Integration with SIGMA SIS

## 2.3 Experience with Facultat Pere Tarres on SaaS

Since 2011, SIGMA has been working on the development of Software as a Service. In late 2012, this service was implemented for the first time with several clients in Spain: Institut Químic de Sarrià, Facultat Pere Tarrés [8], Escuela Superior de Comercio Internacional, TecnoCampus (Escola Universitària del Maresme y Escola Superior de Ciències de la Salut); this turned a corner on the SIGMA SIS solution model SaaS and improves the service to the community.

The Facultat Pere Tarrés, having seen the success of this new model and having known of the existence of our integrations with learning platforms, requested the integration of the SIGMA SIS with Moodle.

At this point, SIGMA offers to Facultat Pere Tarrés the option to host Moodle on our machines and thus have all the academic system in SaaS model.

After the first year of providing this service, it can be valued as a total success. Currently, the Facultat Pere Tarrés has all Moodle courses and users created and configured automatically with SIGMA SIS integration, obtaining the corresponding benefits in decreasing of human resources to maintain de Moodle infrastructure..

Now, teachers and students work in a known environment such as Moodle, from which they can perform all the actions required, including academic efforts, without leaving Moodle at any time.

## REFERENCES

- [1] SIGMA Technological innovation for universities <http://soporte.gestionuniversitariasigma.com/index.php/es/>
- [2] European Research Area <http://erc.europa.eu/>
- [3] EuroCRIS – CERIF initiative <http://www.eurocris.org/Index.php?page=CERIFreleases&t=1>
- [4] IraLIS – International Registry for Authors <http://www.iralis.org/>
- [5] Altmetrics – A manifesto: <http://altmetrics.org/manifesto/>
- [6] Moodle platform: <https://moodle.org/>
- [7] Sakai platform: <https://sakaiproject.org/>
- [8] Facultat Pere Tarrés: <http://www.peretarres.org/eutses>