



CESI was founded in 1958 by five leading French industrial companies (Snecma, Renault, La Télémécanique, CEM and Chausson) who were seeking a way to help their high potential foremen and technicians evolve, acquire new skills and develop their careers. Today, CESI is a higher education and vocational training institution specializing in education and training for managers, supervisors, engineers, technicians and skilled workers.

The CESI Graduate School of Engineering has two branches:

EI CESI (Industry and services, Civil Engineering) with 25 campuses

EXIA CESI (IT -Applied computer science) with 15 campuses

The campuses are located in:

Aix-en-Provence - Angoulême - Arras - Brest - Bordeaux - Dijon

Grenoble - La Rochelle - Le Mans - Lille - Lyon - Montpellier - Nancy - Nantes

Nice - Orléans - Nanterre (Paris) - Pau - Reims - Rouen

Saint-Pierre (La Réunion) - Saint-Nazaire - Strasbourg - Toulouse



We offer undergraduate and postgraduate programmes.

Our Master degrees in engineering are accredited by the CTI (French Accreditation Board in Engineering) and the EUR-ACE®, and the Executive Post Master degrees by the CGE (Conférence des Grandes Ecoles).

To know more about us:

EI CESI was the first engineering school in France to offer an alternative to classical academic teaching : it has more than 25 years of experience in managing apprenticeship (combined work-study programs) in higher education, and benefits from a close contact with companies.

Our combined work-study Master degree in Engineering has been recognized by the French Higher Education Ministry since 1989,. It offers theoretical knowledge and hands-on experience: the students combine full-time periods of study with full-time periods of work.

Today, it has more than 2,000 partner companies.

Students can enroll in: the pre- Engineering cycle, any of our Master degrees of Engineering or the Executive Post Masters programme.

It offers two specializations in “Industry and services”, and one in “Civil Engineering”.

Every year more than 4,000 students enroll at EI CESI, of which more than 2/3 are enrolled in “apprenticeship” programmes. Each year the school awards 1,720 Master degrees in Engineering.

EXIA CESI was created in 2003 by Cesi in order to meet the needs of the computer science field. Back then the job prospects were predicting a growth of the demand by 200,000 jobs within 10 years in the computer science field, which represented 600,000 jobs at the time. This would make it one of the 4 major job creation field - i.e. Employment and education prospective report from the Department of Education and Research.

This increase in the demand meant that the qualitative aspect would also have to evolve and transform radically in terms of the skills required from a computer engineer. Indeed one would not only need to be able to solve a technical issue but would also need to have the capacity to improve, to be more independent, to have rigorous working techniques, to use the quality standards and especially to be able to communicate and fulfill the users' expectations.

In order to meet the needs of this new generation of engineers in education, Cesi relied on its *savoir-faire* drawn from over 50 years of experience. Cesi also benefited from the expertise offered by the University of Quebec in Montreal (UQAM), which had a deep mastery of the innovative pedagogical approach that would be the most suitable for the challenge ahead.

The school was built around a 5-year-program starting after secondary school graduation. After the two first years, students specialize in a specific field, such as software engineering, network engineering or information system management.

From its creation, the main goal of the school was to be closer to both students and firms from a geographical standpoint. Today, EXIA has campuses in 15 different cities in France. This enables the development of strong ties not only with partner-firms – which offer internships and employment opportunities to students – but also with the local administrations to better respond to the economic needs of the region. Finally, the school helps students financially by giving them the possibility to stay in their home-region.

In 2014, the school counted 588 students in the undergraduate program and 668 in the postgraduate program.

All together, **EI CESI** and **EXIA CESI** count more than 50,000 students and graduates.

Both schools have developed educational partnerships with many other schools (INSA network, UT network, CNAM, Arts et Métiers Paris Tech, ITII network, Centrale Lyon, Neoma, ICAM, etc.) and universities (Paul Sabatier Toulouse, Valenciennes, Artois, Pau, La Reunion Island and La Rochelle). We have also forged close links with other actors who share our values or who provide complementary services, such as: APEC, IPSOS, CISCO, AIRBUS Group, etc.

We have developed agreements with about fifty international universities including Northumbria, Portsmouth and Southampton in England, Aalborg Esbjerg and Aarhus in Denmark, Cluj Napoca and Sibiu in Romania, Katowice in Poland, UQAM and ETS in Canada, IIT Chicago in the USA, ITESO in Mexico, Stellenbosch, Pretoria and CPUT in South Africa, Hanyang in South Korea and more. These partnerships open opportunities for internships, dual degree programmes and research projects.

The school operates cooperation programmes in training for the AFD (French Development Agency) and French embassies.

We also belong to several networks such as **Campus France** (French national agency for the promotion of higher education, international student services, and international mobility) and **N+I** (a consortium of over 50 French Graduate Schools of Engineering). We have been awarded the **Erasmus+ Charter**.

Our priority: open admission and excellence through educational innovation.

Research at CESI :

The development of research at CESI aims at strengthening its position as a major player in the field of higher education and research. The CESI Research Department has three national laboratories:

- LIEA (Laboratory for Designing Learning Environments)
- IRISE (Research Institute for Innovation and Business Sciences)
- LUSINE (Laboratory for IT and Digital Business Uses)

They work on 5 research areas: Learning Environments, Innovation, Industrial Performance, Computer Science, Building and Constructions Materials and Structures.

This research activity allows CESI to develop and maintain its faculties' skills and expertise ; to involve students in innovative projects, thus fostering their creativity and entrepreneurial skills ; to participate in local economic development by assisting companies in their R&D programmes, and participating in regional or sectoral clusters R&D programmes ; to support the Group in its international growth by facilitating academic research partnerships.

We recently created a new CISCO-CESI education and research chair called "industries and services of tomorrow".

Our CDIO Representative: M. MORGAN SAVEUSE

Morgan Saveuse joined CESI in 2004, when it was decided to create a new school in applied computer science, with a problem-based learning approach.

Since 2011, he has been Dean of studies for the whole EXIA CESI programme: undergraduate, master and postmaster programs, and fully convinced by the active pedagogy.

Morgan SAVEUSE

Dean of Studies for EXIA IT School of Engineering

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Our prior acquaintance with the CDIO Initiative:

We were acquainted with CDIO through Telecom Bretagne (a French Graduate School of Engineering, CDIO member) through a presentation they gave at their campus. We then discussed the network and initiative with Siegfried Rouvrais, associate professor and researcher. This presentation confirmed our vision of innovation in education and we understood, when consulting the publication *Rethinking Higher education*, that being part of this framework would be meaningful. We then studied the CDIO syllabus to rebuild our own syllabus according to it.

Why do we want to join the CDIO Initiative?

Our decision and strong will to be a part of the CDIO are based on several factors:

First of all, when we heard about CDIO initiative, we were reforming our methods and curricula. This initiative fit our approach directly. The timing was also perfect, as we were preparing for the renewal of our accreditation by the French board of accreditation (CTI- Commission des Titres d'Ingénieurs). We had decided to base our curricula on skills and learning outcomes.

Just as MIT did, we have surveyed students, teachers, tutors, programme managers, companies, CESI employees. We organized a seminar to analyse the results and to design a new curriculum. We were then ready to implement our active pedagogy method (A2P2, which stands for "*Apprentissage actif par projets*"= Project Based Learning) and to reform all our curricula, both within EI CESI and EXIA CESI.

We simply but truly share the same vision of the engineer: "*Graduating engineers should be able to Conceive-Design-Implement-Operate complex value-added engineering systems in a modern team-based environment*". Exia.CESI, our IT school of engineering, has been built on this philosophy.

Since we have started implementing this approach in our curricula, we can measure how involved and interested our staff is.

Working together around this approach can help improve our curricula and practices. Our school belongs to several networks with this aim: **co**operation, **co**-networking, **coll**aborating and **con**solidation of our staff motivation.

To which of our programs do we plan to apply CDIO?

Since we started redesigning our curricula, we have adopted a multidisciplinary learning outcomes approach.

In 2004, we already had implemented PBL in our newly created IT School of Engineering, EXIA CESI.

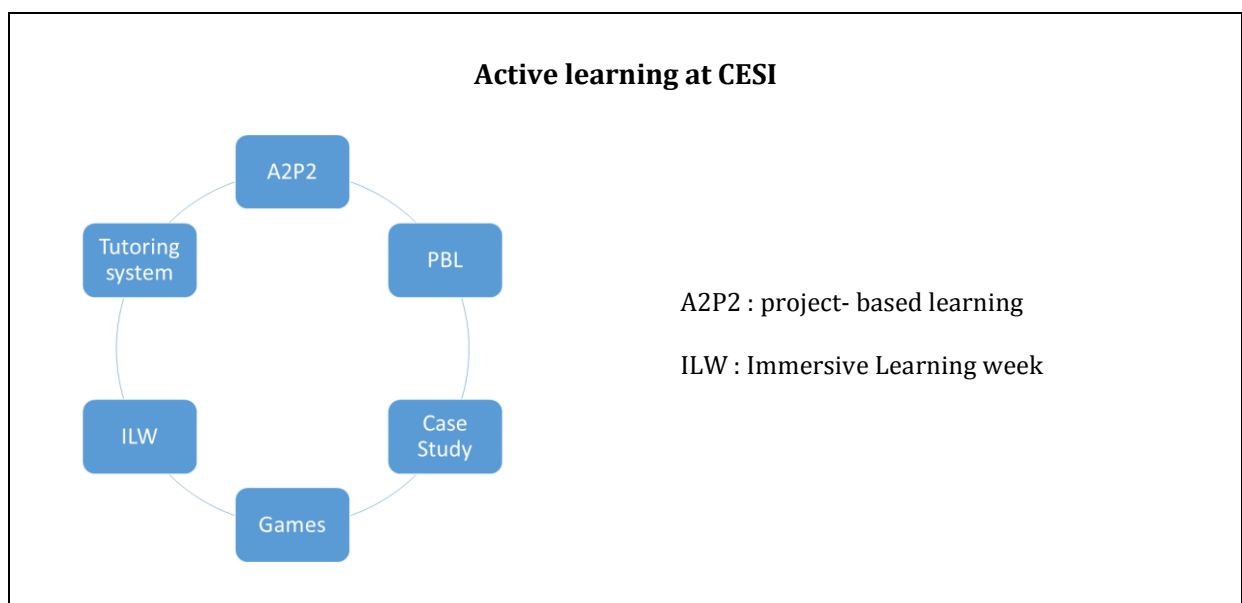
However, as a first step towards CDIO, we restructured the curricula in 2014 in the IT School of Engineering programme, EXIA CESI, involving all 15 campuses.

We recently started the same process with the "Industry and services" programme, as well as with the "Building and Civil engineering" course (both part of EI CESI, implemented on 25 campuses). This means that nowadays all our future engineers are in contact with this approach and our new curricula during their studies.

Skills are integrated via the **PBL** and the **A2P2** ("Apprentissage Actif Par Projet" = Project Based Learning):

=> PBL is used within the IT specialization (EXIA CESI)

=> A2P2 is used by "Industry and services" and "Building and civil engineering" (EI CESI).



How do we expect CDIO to impact these Programmes?

The latest introduction to the CDIO approach has allowed the whole pedagogical staff to redefine and rethink the learning objectives of our courses. Likewise, the CDIO initiative leads to an in-depth reflection about the objectives linked to the student expected behavior.

We believe belonging to this network will help us keep up-to-date and aware of possible educational evolutions and improvement.

What goals do we hope to achieve?

In 2015-2018, we aim to carry on implementing and adapting the CDIO approach in all our courses and programmes (including postgraduate degrees and Executive Post Master degrees by 2018).

This is currently happening. We now need to keep going forward, improving and sharing experiences with other universities.

We intend to re-assess the curricula every 2 or 3 years by surveying the stakeholders.

We also aim to reform full cycles, starting from the 1st year.

We wish to evolve from a static programme towards a dynamic one with constant dialogues around the contents.

The CDIO initiative will enable us to fully reform our courses, including the Executive Post Master Degrees.

We also wish to better involve and listen to the companies' needs.

As a CDIO Regional Collaborator, what would be our plan for participating in/with the International CDIO Initiative:

We will attend the CDIO regional seminars and other upcoming meetings and be involved in any project or publication linked to our know-how.

We could also host an event in Paris or in one the 25 French cities where our campuses are.

How do we envision involving other universities and develop the Initiative locally?

EXIA CESI Graduate School of Engineering is well-known for its active pedagogy (PBL). Therefore we are often invited to share our experience in this field, and we usually mention our interest in the CDIO initiative.

Recently, we invited ESTP (A French graduate School of Engineering specialized in Civil engineering) to our seminar during which we launched the start of the year and could present our approach to the 1st-year students.

We also presented the A2P2 implementation during a lecture organized at the Quebec government office in Paris this month.

The next step would be to fully present the approach and framework. As we belong to several networks, we would be an active ambassador for the CDIO initiative.

In terms of communication, we will publish the CDIO logo and write articles on our websites and social networks    ...

What experience do we have in engineering educational reform at our school which might contribute to the effort and form a foundation for the work as a collaborator?

We were pioneers in apprenticeship in the 80's: we became leaders and references in Europe. Apprenticeship, also called "combined work-study program", and vocational training are two of our strengths, and both of them required a strong educational reform.

Because of our involvement in apprenticeship, our programmes are recognized as being of public benefit.

Our curricula and courses are national and followed by our 25 centers based in France, which implies a great organization, coordination and involvement many collaborators.

We first adopted active pedagogy in 2004, and we often rethink our curricula. We just started a deep educational reform linked to competency-based education.

Educational reforms happen in our school every three years, more or less (related to the CTI requirements and renewal of our accreditation).

What level of commitment and support do we have from our Dean and Central Leadership?

The director of the school, Jean-Louis Allard, initiated our commitment and is providing leadership in this direction.

The academic team is also fully on board. We organize pedagogical seminars twice a year and financially invest in the training of our teams. We coordinate the different cycles of projects from the Central Direction towards the 25 campuses, but the teachers from these campuses are fully involved in the process of active pedagogy : designing and launching the projects, but also coordinating and assessing them.

Who will be the key two to five participants in your effort?

Morgan Saveuse *Dean of Studies, EXIA CESI*
Isabelle Caradot *Dean of Studies, EI CESI*
Stéphanie Dumortier *Head of International relations*

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