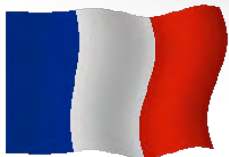


Worldwide perspectives of adapting engineering education to change



Humanism and diversity, The real basis of its identity

1957 Creation of INSA Lyon and the Humanities' Centre

- Social and territorial diversity
- Academic diversity
- Open to the world
- Integration of disabled people
with individual solutions
- Equal opportunities for men and women
- Society oriented

INSA model Become an engineer → a key player for progress

To understand

- socio-technical challenges
- industry perspective

Critical thinking & Problem-solving
in a complex and fast evolving context

Ability to/ Competencies

- learn
- adapt
- manage
- innovate
- undertake
- Communicate
- ...

Competencies-based
approach

Globalization



- **International mobility mandatory**
- **International campus/ multicultural working-groups**
- 10 foreign languages/ 2 mandatories incl. French as foreign language
- 4 International UG tracks (2-year curriculum)
- Courses in English incl. Summer courses
- **Foreign faculty members**
- 200 partner universities

Humanities center

20% of INSA curriculum in Humanities & social sciences

- Theatre,
- arts,
- management,
- ethics,
- Sport,
- Foreign languages,
- Communication
- ...

Project manager

- quality manager
- Product developer
- ...

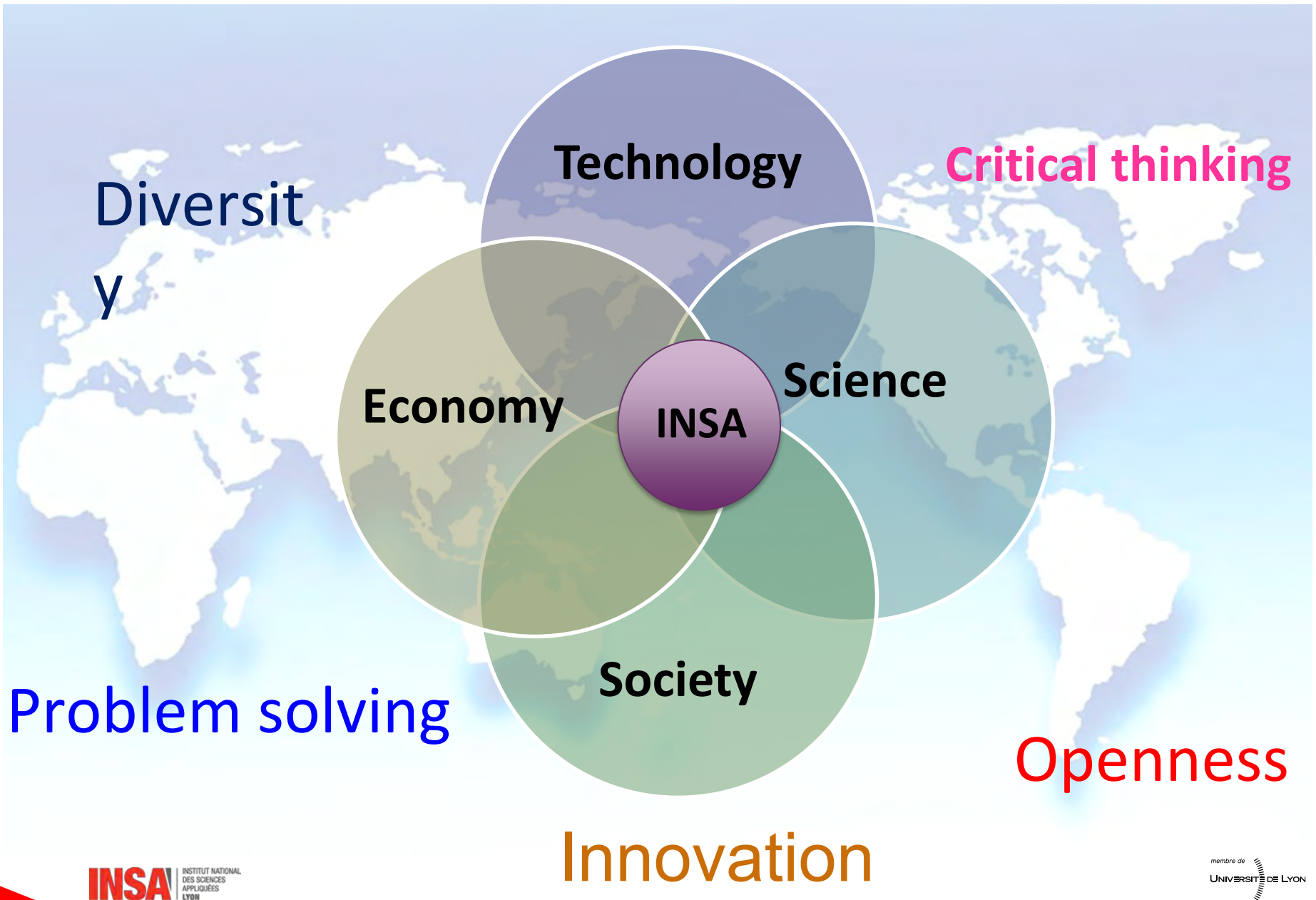


Holistic view of project management

Links with industry

- Internships (7+ months)
- 19% of teaching staff coming from industry
- Industry representatives
 - within the board of trustees
 - within the academic advisory board
- **Cases study**
- Sponsorship of a cohort
- Entrepreneurship program
- **Industrial chairs** (education and research)

INSA Lyon An integrated approach



Innovative engineering education



Generate & extend ideas

- self-evaluation
- Benchmark
- Incentives
- ...

INSA Model New initiatives (1)

- P2I Cross-disciplinary track for Introduction to Engineering (2016)

4th semester/ Year 2 (180 hours)

- A problem submitted by the industry
- A multi and cross-disciplinary problem-solving approach
- Thinking mindset to develop real solutions
- Co-designed course (UG+G faculty members/ several departments)

Guided reflection on impact on society

INSA Model New initiatives (1)

- P2I Cross-disciplinary track for Introduction to Engineering (2016)

Group of 6-8 students

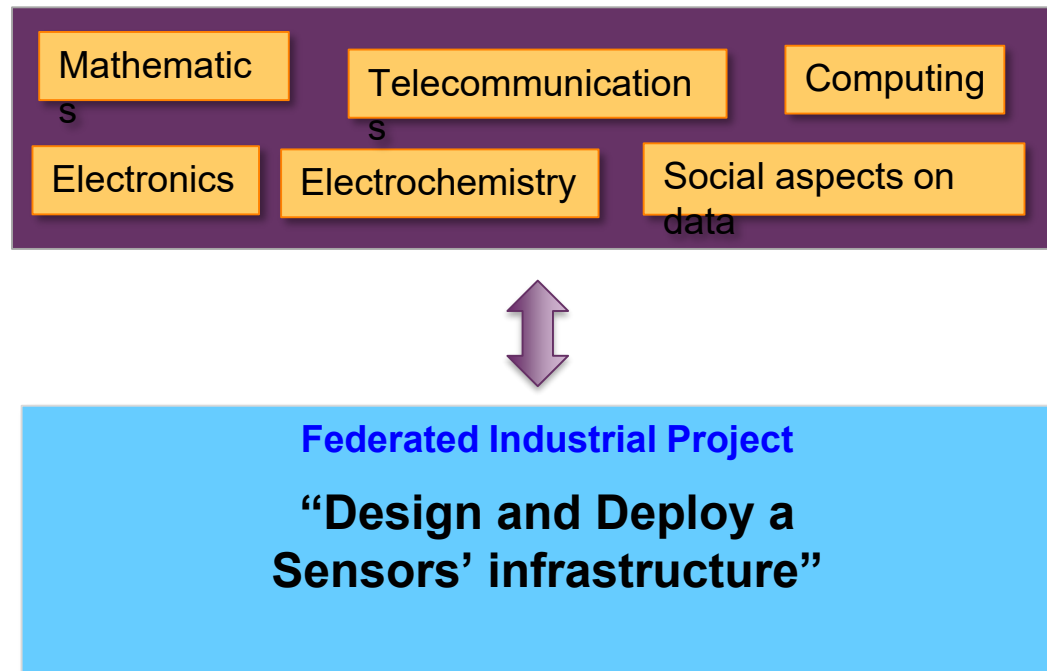
French and international students

Male and female

Several professors coaching/ different expertises.

Individual + group works

P2I (1) Cross disciplinary-based Engineering Education



Learning outcomes

- Design a Physical Sensor Layer
- Set up Electronic Acquisition Circuits
- Analyze Data Sensors
- Set up Sensor Communication and Databases
- Debate on socio-technical questions on Data and Society

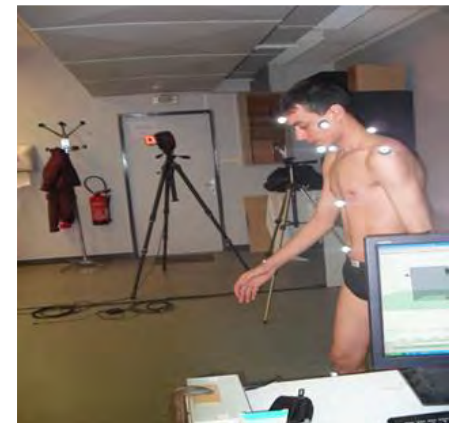
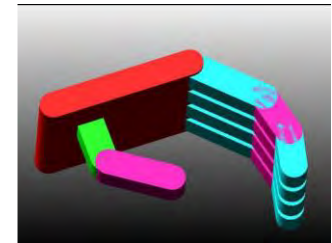
P2I (2) Multidisciplinary-based Engineering Education

P2I Engineering & Health

- The involvement of mechanics in the field of health
- Analyze the motricity, Develop a tool to evaluate lesional risks
Snowboarders & roller skating falls/
Biomechanics of human movement/ Tibia prosthesis

With the collaboration of medical doctors, industries and high-level sports athletes

Anatomy, Mathematical modelling
Kinematics for sport application, Material science
Medical imaging, Traumatology
+
**Ethics, augmented human, transhumanism,
perception of disability...**



INSA Model New initiatives (1)

P2I Multidisciplinary-based Engineering Education

Evaluation survey

819 students/ 349 answers

Overall satisfaction: 81,6%

Feedback from the students

-

- Requires more work
- More difficult at the beginning

+

- Increase motivation to study/ contextualized learning
- Learn more program languages
- Give more sense
- Help to define further academic orientation
- Introduction to cross-disciplinary approach
- Understand the links between engineering sciences and social & human sciences

P2I Multidisciplinary-based Engineering Education

Feedback from the professors

-

- New process for teachers
- Evaluation is more difficult (don't master the topic)

+

- Positive impact on further multi/cross disciplinary research
- Pleasure to work together
- Improve students attentiveness, concentration & involvement

INSA Model New initiatives (2)



From National strategy to local initiatives
Close collaboration local authorities & INSA Lyon

854 open data available

Towards smart cities

Encourage citizens & HEIs/students to create new services



INSA Model New initiatives (2)



Towards smart cities

Examples of students' projects

- Alfred: Mobile app/city management: sharing new ideas and feedback
- GONAP: to locate relaxing spots in the city/ sun, distance, noise
- Chatbot to interact with the City via social networks
- Interactive urban games /Kinect sensor
- MixMytape: to integrate a friendly ambiance with music in common spots of the city/ users' tastes + interaction & feedback



Representatives of the city of Lyon in the assessment panel

INSA Model New initiatives (3)

- INSA Group/ Bi-annual Workshop on innovative pedagogy
6 INSAs in France, 10% of French Engineering graduates

A 2-Day event

Experiences & best practices

- Digitalization
- *Ingénieur humaniste/ Renaissance Engineer*
- Competencies approach
- Personal development of students/ role of teachers/educator
- ...



Round-tables, posters, workshops..

INSA Model New initiatives (4)

- ATENA a pedagogic support platform
- To guide and support teachers/ adapted tools & behaviors
On-line documents + Training sessions (every month)
- Teaching and learning (3h)
- Teaching with learning objectives (3h)
- How to motivate students to learn(3h)

In collaboration with the School of Architecture

- Students working in groups (4h)
- Problem Based Learning (4h)
- Flipped classroom (4h)
- ...

INSA Model New initiatives (5)

- BONUS BQF (Qualité Formation/Quality Education)

A call for projects (2 years): 200K€

To support new teaching approaches & curriculum design
Multi-departments concept



Worldwide perspectives of adapting engineering education to change

To conduct change

To support and motivate new initiatives

To develop an attitude of longlife learning

To adapt

...

To listen, to share , to benchmark

Gaston Berger (1896-1960): Philosopher, teacher, manager , Director of Higher education (1896-1960). **Father of the French prospective and co-founder of INSA Lyon**

***« L'avenir est moins à découvrir qu'à inventer
It is less to discover than to invent... »***

