The Foundation La main à la pâte: Some evolution in its activities

IAP/SEP global council
Bangkok  Aug 2019
La main à la pâte initiated by G. Charpak

The reality in 1995 in France:

- 3% of teachers actually teaching science
- scientific vocations decreasing
- success of "hands-on" methods in US (L. Lederman)

Under the impulse from Georges Charpak (Nobel prize in physics), Pierre Léna and Yves Quéré, the Académie des Sciences launches the program “La main à la pâte” to develop and reinforce sciences at school
Science at school: the brakes

- Hierarchy is not always convinced that science teaching is useful in primary school.

- Nor are parents...

- Teachers fear to teach sciences
  - "I don’t know / I’m not a scientist"
  - Afraid of doing experimental work

- and using active pedagogy
  - Change their position in the classroom
  - Afraid of losing the classroom control:
    - allowing the children to speak
    - organizing children in groups
    - Keeping things in order, buying material...
Philosophy of IBSE at La main à la pâte

Science as an inquiry, as an investigation

Emphasis is put on questioning / Action / Experimentation/ work team...

Something pupils do, not something that is done for them

Teacher helps pupils to build their own knowledge

Presentation in an oral or written way (science notebook)
Lamap principles

- Focusing on children curiosity and desire to learn;
- Designing & implementing IBSE principles;
- Involving the scientists/engineers;
- Opening the school to parents & local community;
- Helping the teachers directly (bottom-up, in-service);
What was done for teachers?

- Website and forum
- Training and coaching
- Resources for teacher
- Meeting and training with scientists
- Collaborative projects
- Experimental kits
- Science events
- Ressources centres
Strategic areas of the Foundation

Produce resources

Develop international partnerships

Promote equal opportunities

Engage with the scientific and industrial world

Rethink professional development
LAMAP : a 24 years venture

From Primary to Middle school, in France and abroad

International action (2000)

La main à la pâte (1995)

EIST* (2006)

Houses for sciences (2012)

Pilot middle school LAMAP (2016)

Created in October 2011

Integrated teaching of science et technologie in Middle school
Long term goal: a broad institutional impact in France

(350 000 teachers K-5 ; 7000 middle schools 6-9)

METHODOLOGY

- Introducing **disruptions** in the education system ;
- Using Academy’s independency to implement **prototypes** ;
- Developing high quality, free, easy-to-access **resources** for the classroom ;
- Fostering **dissemination** by contagion ;
- Inspiring **in-depth changes** of the public system ;
- Working closely with the scientific community ;
Long term goal: a broad institutional impact in France

(350,000 teachers K-5; 7000 middle schools 6-9)

SUCCESSIVE DISRUPTIONS

1. Natural science in primary schools 1995 ⇒ now
2. Integrated, interdisciplinary science in Gr.6-7 2006 ⇒ now
3. Professional development of teachers (K-9) 2012 ⇒ now
4. Prototype Middle schools in science/engineering 2017 ...
Disruption 1 - Natural science in primary schools

In Education 3-13 (2011)
M Delclaux & E Saltiel
La main à la pâte, France

Teachers are key

Assessment of Primary school teachers training/support for IBSE practice
Disruption 2: Interdisciplinarity in 200 Middle schools

Lamap EIST 2006 -> 2015 Science Interdisciplinarity in Grades 6-7

Physics-Chemistry       Life & Earth sc.       Technology

3 teachers, working together, teaching all 3 subjects (EIST)
Disruption 3 – *Maisons pour la science*
Houses for science, to serve teachers

- Official Continuous Professional Development of teachers almost disappeared since ca. 2000;
  - Negative impact on science education K-12;

- Creation of 10 (12 soon) Houses, since 2012
  - Based on Lamap expertise since 1996
  - Partnership Scientists/Engineers/Pedagogy (50/50)
  - Installed in University
  - Goal (reached): 13 000 teachers/year
  - Production and dissemination of resources
  - A fruitful network w many exchanges
10 Maisons pour la science, to serve teachers

- National coordination
- 10 houses in regions
- 23 satellite centres
Disruption 4- LAMAP pilot middle schools

Interdisciplinarity + Inquiry (K6-K9)
- energy, biodiversity, robotics…

Opening to science world
- Scientific mentoring, partnership with labs, visit on industrial sites

Expansion
- 2019: 80 middle schools, 450 teachers (70% disadvantaged areas)
- 2020: 120 / 2021: 150 middle schools
The successive strategic plans

1995: Science in primary school
2006: Integrated science in middle school
2012: House for science – CPD

New projects
- 24 pilot centers
- Pilot middle schools
- 1,2,3 coding Youtube
- Scientific thinking, critical thinking

2016: Science - lever of success and citizenship for young people

- Continue our action in primary school
- Increase significantly our action in middle school
- Train to the digital revolution
- Be more engaged in improving “living together”.
Digital revolution: 1,2,3 Code

In France
- 2 resources for primary and secondary schools
- CPD for teachers

Over the world
- Translation in 2 languages (English and German)
- CPd in Europe and Malaysia

Impact
- > 10,000 primary teachers
- > 3000 secondary teachers
Scientific Thinking / critical thinking

2 Units

Dedicated website

MOOC

CPD

Training kits

Research

20/08/2019
The new strategic plan

- Closer relation w industry
- Emphasis on sustainable development issues
- Enlarge the population and the duration: the STIMULI project
- Benefit from the digital revolution: self-training for teachers

New projects

- New partnership (Chemical)
- Office for Climate Education
- Changing of scale
- Self-training through the web
New partnerships with enterprises

Chemistry
- In partnership with Fondation Maison de la chimie
- Example: Energy, Matter, . Involving scientists and industry

3D conception
- National contest for 3D makers – classes organized as start up
- Award for middle school (junior and high school)

Professional development activities in and with industries
- Total, Michelin, Saint-Gobain…
Sustainable development: OCE

Mission
- educating the young generations of today and tomorrow about climate change

Activities
- Resources for teachers and trainers
- CPD sessions
- Conferences

Network
- Several organizations partners of La main à la pâte (special focus on south America)
Change of scale: all teachers on 8 years

Disruption 5?

→ At the scale of a large region (Great-East)
→ Train to IBSE from L1 to 3rd year in-service
→ Project **STIMULI** proposed to the government (decision in fall 2019)
  - Connected to R&D in education (short loop)
  - New resources + social networks
  - Local centers + fablabs to support teachers
  - Self-training platform
  - Evaluation of impact
- Translational
- Retroaction
- Evidence based

Research

Local CPD centers

R + D CONTINUUM
STEM and Literacy CPD
From Licence to the 3rd year of teaching
Presential + on line

Dissemination

Impact

- Resources center
  - Involving scientists and industries
  - Local support

- Impact on teachers and pupils (with the ministry evaluation department)

- Through the Houses for science
Paul Durand

**My Courses**

Course A
+ completion

Course D
completion

Course E
+ completion

Calendar

Notifications

Messages
International dissemination

Europe

→ 2016-2019 : LINKS on Science CPD (9 partners)

All over the world

→ International seminar
→ Pluriannual programmes in Africa : Senegal, Madagascar, Mali, Sudan.
→ Translation of various resources
Scientists are essential to develop IBSE