Restructuring Education to Help Students Learn How to Learn

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Where we have come from

• Students see our education as very good

• First year is very challenging
  • High level of competence required...
  • ...in many subjects

• Different outcomes:
  • Some emerge with good content knowledge and ability to solve problems
  • Some learn enough to pass exams (and then forget)
  • Many don’t learn enough and don’t pass

• JSP (Faculty Retreat) 2015 established a Task Force on Education
1. Narrow the Polytechnic Core to provide more depth and time for understanding on fewer disciplines, and increased focus on personal work.

2. Focus on thinking skills: being able to abstract and to model, systematic approach to solving complex problems, computational thinking.

3. Support pedagogical innovations aimed at improving the effectiveness of students’ personal work, fuelled by teachers and by the digital revolution.
A Strategy for Developing our Education

...at the interface of Arts and Technology
Polytechnic base

Students will:
• have a strong, shared foundation in core scientific disciplines
• develop the deep understanding in these disciplines
• become an independent and autonomous learner
Reduced number of courses in first year

MOOC supports for first year core courses

Pedagogical R&D on Flipped Classrooms in Linear Algebra

Book, MOOC and classes for students on study and thinking skills
Practical Learning

Students will be able to:

• solve open-ended, interdisciplinary problems
• manage team projects
• be ethical in their professional life
• take into account financial constraints and realities

Photos: Alain Herzog & http://robot-competition.epfl.ch/
Discovery Learning Labs (e.g. ME building)

Interdisciplinary extra-curricular projects

Practical Learning

Projects built into the curriculum

Pedagogical R&D on working in teams, open-ended design projects

Personalised Learning

Students will be able to:

• Make decisions about what to study and how

• have choices

• have tools to enable them to make informed choices

Data mining to represent the Swiss IT job market by the Centre for Digital Education (CEDE), EPFL
Using Big Data to map the study programme routes available to students.

Using MOOC data to analyze learning strategies and rates of success.

Images from the Centre for Digital Education (CEDE), EPFL.
Conclusion

Polytechnic Base

Practical

Personalised

Images: Alain Herzog, Giordano Favi
CEDE, EPFL