

# The French Higher Education System and the “Grandes Ecoles”

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The French higher education system is based on some rather simple facts.

- a long tradition of Universities, with an objective of creating and transmitting new knowledge, especially in humanities, law and medicine: science is much more recent and engineering just starting .
- the development outside Universities of a system of vocational training, through apprenticeship first, then through dedicated institutions.
- the high status of science (especially mathematics) due to the influence of the philosophers of "Siècle des Lumières" and subsequently to the higher rank given to engineers in the State hierarchy .
- the principle of democratic access to higher education, which, in France, means public funding and free admission.
- the confusion between the high school final examination and the university entrance test, namely the "baccalauréat".
- finally, the "massification" of higher education during the past 30 years.

There are obviously some contradictions between the conclusions which come out of these elements: for example, it is not possible for universities to accept about half an age class and to pretend not to be involved in vocational training. In a period of difficulties on the job market, the quality/cost ratio becomes a critical parameter.

Originally vocational schools for engineering and management, the Grandes Ecoles have exhibited a strong evolution. Due to the fact that entrance is submitted to a competitive examination, they gather very high quality students (about 22.000 per year among the best students of an age class) and they have become centers of excellence. Moreover, the development of research in engineering has induced both strong academic positions and relations with industry. Finally, according to the expectations of all concerned people, the scope of the curricula in engineering is enlarged to economy, management and social sciences.

The other basic features are as follow (we shall restrict ourselves to engineering schools).

- The programme necessary to get the "Diplôme d'Ingénieur" lasts 5 years (in principle: most students get this diploma after an average of 5, 4 years). For 70% of the students, the Ecole is responsible only for the 3 last years: the first two years take place in special classes located in high schools (lycées), called "classes préparatoires". The real selection takes place before entering "classes préparatoires": the competitive examination provides a ranking of the students (... and of the institutions!) since the total number of admissions is roughly equal to that of the candidates.

30% of the students are admitted either directly after baccalauréat or with a University degree.

- The size of the institutions is small: average number of first level diplomas is about 130, but the efficiency is close to 100%. This is very useful for flexibility and internal management: but it is a handicap for international visibility. Networks based on a voluntary basis have been built, in order to improve the adequation to the international standards for a University of Technology. This means that the faculty/student ratio is rather high and that teaching is based on personal relationships between the professor and the student. The total number of degrees in engineering granted is about 17.000 per year (this is not the total number, because about 50 Departments of Engineering have been opened in Universities, since 1990: moreover, Grandes Ecoles in management grant about 5000 diplomas).
- On the contrary to other countries, there are no professional orders, nor charter system: the institutions and the programmes are accredited through an official public body, called "Commission des Titres d'Ingénieur" which guarantees the quality of the education granted to the graduates. It is composed of 32 people representing both the teaching system and the economic actors.
- Most Grandes Ecoles have developed research activities: they grant 2000 doctorates per year (about 20% of the total French production of doctorates) and they operate research contracts to an amount of 900 MF.F.
- They are also involved in continuing education programs.
- Finally, they have developed international relations. These are especially active in doctoral and continuing education programmes (about 20% of the students), much smaller in first-degree preparation (about 5%).
- The cost per student is about 3 times that of a university student: but referring to the cost per diploma, it is about the same (in engineering, about 500 kF.F. for the total 5 years programme).

As a conclusion, it can be said that Grandes Ecoles have not been too good, compared to other systems, when industry expected highly specialized skills from the young graduates. But, due to the rapid evolution of technology and society, they rely now more on adaptability and leadership: in that sense, Grandes Ecoles could be considered as a model for the engineering education of the future.