An International Engineering Programme in France

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ENST Bretagne/"n+1 programme"

Introduction

In the late 1990s, the French government realised that the numbers of international students choosing to come and study in France had been declining for several years. During the period 1990-2000, other nations had been extremely active in offering attractive "study packages" for potential, non-native students. For universities in some countries, such as Australia, the revenue resulting from such programmes now represents an extremely important part of their overall income. A non-American student who goes to study in an American university will, obviously, absorb American culture during her/his stay, as well maintain links with the "alma mater" through the "alumni association" after returning home. Strong links are forged between the international student, the chosen university and, in the case of engineering students, with industry.

In truth, French universities and "Grandes Écoles" had probably been slow to adapt to the new phenomenon of globalisation and to all the possibilities on offer in the field of education. Their activities in this field had been limited to those countries which, for reasons of history, had been exposed to French colonial influence. Such countries are mainly located in the African continent. They are generally French-speaking and they continue to send students to be educated in France.

However, the time had come to look further afield, and examine the opportunities available to attract non-French speaking students to France and to enable them to integrate the French education system in a relatively painless manner. Great efforts were made to attract suitably qualified students from the Far East, especially from Asia and the Indian subcontinent.

However, one vital question had to be answered which would affect the whole project:

Should the language of instruction be French, or should English be used as a kind of "Esperanto," enabling students of various nationalities to communicate with each other as well as with the indigenous student body?

To benefit fully from the whole experience of studying, living and working in France, it was decided that French would be used and that the international student body would thus be able to join in fully with all the activities of the home students. It is interesting to note that in Germany, which has developed a large programme of one-year "Master of Science" courses in its universities aimed at international students, the opposite choice was made and all classes are given in English.

Why study in France?

The major assets of France had not been exploited as much they should have been. If you ask any American student what they know about France, the answers normally include at least one of the following elements: wine, perfume, General de Gaulle, Brigitte Bardot, Jacques Cousteau, the Eiffel Tower and food.

NB. Education does not normally appear in the list!

However, the French language is used by almost 200 million people worldwide in the 47 countries for which French is one of the official languages. Other assets include:

A world reputation in

- transport (Aérospatiale/Airbus Industrie, Ariane, Eurostar, Peugeot, Renault, the High-Speed Train or TGV…)
- chemicals/materials (Air Liquide, Michelin, L'Oréal, Pechiney…)
- energy (TotalFinaElf, nuclear energy…)
- technology (Alcatel, Alstom, Dassault, Sagem, Thomson…)
- communications (Hachette, Havas, France Télécom, Vivendi…)
- food/drink (Lyonnaise des Eaux, Pernod-Ricard…).

Excellence in engineering education

- strong scientific and technological course content
- world-renowned laboratories, teachers and researchers (the "Fields Medal", the equivalent of the "Nobel Prize" in mathematics, has almost found a permanent home in France)
- engineering courses in France generally also include elements of the social sciences and training in management.

Industrial involvement

- engineering programmes in France include training-periods in industry which are integrated into the course and which are assessed by the academic body and the industrial supervisor. Regular visits to the Production and R&D facilities of industrial partners also becomes possible
- industrial sponsorship is another possibility. For example, a French company wishing to invest and develop its activities in China could "sponsor" a Chinese student throughout his/her studies in France and then hire the student full-time at the end, once the student has assimilated the French way of doing business and obtained a French "Master's" degree.

France itself

- France is located at the crossroads of Europe and provides any student with the opportunity to establish long-term contacts with industrial and academic partners in other Member States of the European Union.
- France possesses a long cultural heritage and is not an unpleasant place to live and study in for a few years!

For all of the reasons stated above, the "**n+1 programme**" was born in 1999 and has since been integrated into a French educational and cultural organisation called **EduFrance** which is opening centres throughout the world.

The "n+1 programme"

The "**n+1 programme**" aims to attract non-French students, who already hold the equivalent of a "Bachelor" degree, into French universities and "Grandes Écoles" and, within a two-year period, to take them up to "Master's" level. It includes a large network of different universities covering many engineering disciplines (electrical/electronic, computer, mechanical, chemical, aeronautical, food safety…). The host universities are located in major towns and cities throughout France.

Figure 1 describes the make-up of the programme:

July n >>> September n	Learning French at specialised centres throughout France while living with a French family and assimilating "the French way of life".
October n >>> End-December n	Attending an "Induction Course" in the chosen engineering discipline: • electrical/electronic • chemical • food safety • mechanical • computing • aeronautical… This three-month "Induction Course" is typically made up of the following elements: • three hours of science course-work and practicals every day • two hours of tuition in the French language every day • once every two weeks, a half-day visit to local industries • an introduction to "French life" (visits to local attractions, government offices, City Hall…). During this period, the international students • live on the university campus • attend course-work together as a group • are "twinned" with a local French student-mentor.
January n > >>> March n	• Progressive integration into course-work with the regular French students. • Continued tuition in the French language + English.
April n >>> June n	• Full integration into course-work/project-work with the regular French students. • Continued tuition in the French language + English.
July n >>> September n (Summer vacation)	A three-month, paid summer internship with a French company/awareness of industrial problems/management.

October n+1 >>> March n+1	Around 800 hours of lectures, practicals, project-work in a specialised field of study in the chosen domain. For example, in the author's college, a choice of **one** of the following specialities must be made: • multimedia networks and systems • optical telecom networks • computing for telecoms • design of integrated circuits • artificial intelligence and cognitive sciences • signal and communication systems • microwave and optical systems • image and artificial intelligence • design and marketing of telecom services • business engineering. NB. Further tuition is also provided in the French and English languages.
April n+1 >>>September n+1	• A project in French industry leading to a written dissertation which is defended orally in French in front of an Examination Board made up of college professors and representatives from industry. • Final test in the French language + English.
September n+1	**Graduation** The French "Diplôme d'Ingénieur" which is the equivalent of a "Master of Science" degree (fully accredited by the CTI/French ABET).

Figure 1

The main points of this multidisciplinary "Master's" programme are, therefore:

- **Mastering the language of the country = French**
  (two month summer programme + intensive tuition throughout the whole course).

- **Orientation during the "Induction Course"**
  (history, culture, role on international scene, economy, political and social structure of France).
  Keywords: personalised teaching + confidence building

- **Mainstreaming international students with national students**
  (offering access to a national degree/preparation for today's multinational workplace).

  NB. National and international students study together for the same degree and are subject to the same recruitment criteria in the marketplace.

- **Professional training through integrated, final-year industrial placement and summer placement**
  (all students apply and organise their skills in real projects + real workplace conditions).

- "**n+1**" **= boosting employability.**

Some figures concerning the "**n+1 programme**" may be seen in Figure 2:

2000-2001	• Around 80 international students registered. • 30 partner institutions in France (universities and "Grandes Écoles"). • 5 "Grandes Écoles" organising "Induction Courses"
2001-2002	• Around 200 international students are likely to be accepted from the 3000 applications all made using the Internet. • 40 partner institutions in France. • 10 "Grandes Écoles" will organise "Induction Courses" in various engineering disciplines.

Figure 2

Reflexions on the first "Induction Course"

Of the eighty international students involved in the five "Induction Courses" in France from September through December 2001, twenty-three were registered at the author's college, the "**École Nationale Supérieure des Télécommunications de Bretagne**" (**ENST Bretagne**), a college located on the Atlantic coast in North-West France specialising in all aspects of telecommunications and information technology. They were all holders of a "Bachelor" degree from universities in their home countries and were made up of:

- 17 Chinese
- 4 Indians
- 1 Thai
- 1 Hungarian.

At the end of the three and a half month "Induction Course," twelve of the students had been pre-assigned to remain at ENST Bretagne for another twenty months (January 2002>>>September 2003), while the remaining eleven had been designated to register at other partner institutions of the "**n+1**" partner programme in colleges in other areas of France. (Metz, Paris and Toulouse).

At the moment of writing (8 January 2002), it is difficult to assume an objective view of the results of our first "Induction Course" which ended just 24 hours ago with the departure of half the group to other colleges in France. Similarly, it is impossible to say how the remaining members of the group will adapt to life at the college now that they are being "thrown in at the deep end" with regular French students.

However, the following comments classed as "Positive" and "Negative" may be of some interest to other institutions which might be considering trying to attract overseas students.

Positive points

- Real motivation of all students to study telecommunications technology/the IT world.
- An excellent group dynamic (none of the students registered on the "Induction Course" wished to leave France at the end of the course!).
- Inquisitiveness about France, the French people, Europe/the European Union, the arrival of the Euro currency on 1 January 2002.
- Dedicated college professors at ENST Bretagne, who were willing and able to become "tutors" to overseas students as well as adapt their pedagogical approach to the specific needs of this group of students.
- Widening the horizons of the French students by giving the campus a genuine international flavour and, indeed, encouraging the French students to consider registering on the college's own "Study Abroad Programme".
- Establishing a "twinning" relationship between each overseas student and their French counterparts.
- Persuading the college restaurant to do the unthinkable in France = provide vegetarian meals!

Negative points

- Tendency to remain together as a "club" rather than integrate with the French students.
- Initial tendency to use English as the common language.
- Difficulty in assimilating the French language and, in some cases, French food.
- Bureaucracy: enormous amounts of time and paperwork were involved in obtaining "Foreign Residents' Permits," opening bank accounts, obtaining adequate insurance and medical cover, organising compulsory medical visits…

For such a programme to function smoothly, at least one employee must be designated to work full-time on organising all aspects of the course (scheduling timetables, looking after the bureaucracy and everyday needs of the students, arranging the excursions and external visits…).

NB. The students arrived with us at ENST Bretagne on 17 September 2001, six days after the events of 11 September 2001.

Conclusions

One quarter of all students at ENST Bretagne are international students (243 out of 900 students from thirty-seven different nations, including "Master's" and Ph.D students) and the college has acquired a certain international reputation over the past ten years. The arrival of students from Asia and the Indian subcontinent has posed fresh challenges but has proved to be highly stimulating for all those members of staff and faculty involved.

One of the major risks involved in attempting to attract overseas students is the fact that it is, doubtless, very easy to view such students as an "easy" source of incoming revenue, while providing them with a minimum service in terms of the quality of the education on offer. I have heard such criticism on several occasions and in different continents over the past few years, often from the mouths of the international students themselves, who sometimes consider themselves to be the victims of a greedy system.

One objective of the "**n+1 programme**" is to offer the possibility to companies of consulting the application forms of the students, in order to select the student they want to financially support. This is easily done because of the "on line recruitment" set up by "**n+1**". By using a simple personal login and password, any partner of the "**n+1 programme**" (French engineering institutes, companies...) can have an immediate access to the whole data base in which files can be selected by using keywords (topic, nationality...).

This selection process will soon be open to French students willing to go abroad to study on a Master's degree course. Any foreign university can join "**n+1**" network to have a personal access set.

It is to be hoped that the "**n+1 programme**" which is still in its infancy, will continue to be selective in the choice of its candidates, that it will maintain its high standards and that it will not fall into the "revenue trap" which has proved to be so enticing for certain other rather unscrupulous institutions throughout the world, whose main interest in International/ Overseas/Foreign Students appears to be more oriented towards the bottom line of their own bank statements than in providing an excellent education.

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