Gap Year in french engineering curricula

Christelle Didier, Patrick Simonnin

"Gap year" in French Engineering curricula
Ethical issues of a trendy educational device

C Didier
Assistant Professor
Lille Catholic University, Department of Ethics
Lille, France
E-mail: christelle.didier@icl-lille.fr

P Simonnin[1]
Assistant Professor
Lille Catholic University, Department of Ethics
Lille, France
E-mail: patrick.simonnin@icl-lille.fr

Conference Topic: Ethics in Engineering Education

Keywords: Engineering Ethics; Engineering Education; France; Gap period; Gap year

INTRODUCTION

This study began with a simple astonishing observation. In the very specific context of Engineering Education in France (mainly given in rather elitist "Grandes Écoles"), a new phenomenon is taking root at an ever-increasing rate, namely the "gap year", an educational device which is gaining exponential popularity among the students. This kind of implement, at the moment lacking in any real institutional regulation at a national level raises some practical, but also fundamental questions.

Firstly, we will describe the general framework of our research: this will help to give some depth to this field of study. Then, we will present this new rising phenomenon in a broader context and will try to explain what it consists of and the different ways of evaluating it. The analysis of two exemplary case studies will enable the reader to apprehend the great variety of practices regrouped under the same label. We will finally conclude by suggesting some paths toward a further and deeper problematization.

1 THE CONTEXT OF THIS STUDY

This communication is part of an ongoing research program on the values of engineers. It is situated at a crossroads between the sociology of professional groups and the sociology of values. This program builds on a quantitative study carried out with the *Conseil National des Scientifiques et Ingénieurs de France*[2], which aims to update and enlarge on past results and

[1] Corresponding Author: P Simonnin, patrick.simonnin@icl-lille.fr

[2] http://www.cnisf.org/

to undertake various comparative research studies [1], [2]. Since French engineers appear to have rather singular values in comparison to the general population, the question arises as to the reasons for their peculiarity. Three main explanatory areas may be explored, corresponding to the various spheres of socialization for an engineer. The first highlights their social origin (socially and culturally privileged families); the second will focus on their Higher Education years, assuming that the engineers' ethos is the result of the transmission of values during their training in Engineering Schools (Grandes Ecoles d'Ingénieurs), while the last will see the engineers' professional ethos as the product of an "acculturation"[3] in the world of work (more specifically, major industrial companies). Our research program studies how these three spheres of socialization help shape the engineers' world of values. The framework of the study we are presenting here primarily corresponds to the second sphere of socialization, that is to say, the professional socialization in French Engineering Schools.

We focus here on an extra-curricular device, the "gap year"[4], proposed to their students by an increasing number of French Engineering Schools. This study was first motivated by two facts: firstly, the exponential development of this practice and its correspondingly tremendous success among the students. Secondly, the evidence that the pedagogical goals of these "gap years" are rather unclear and even divergent: some Schools insist on their educational aim, using words such as emancipation, maturity, personal development, social and cultural awareness, while other Schools will insist on the professional aspect: pre-professionalization, adaptation to the business world, broadening of the skills base, increased employability, etc.

2 DESCRIPTION AND APPRECIATIONS OF THE VARIOUS ACTORS

2.1 What is it all about?

In France, Engineering Education is essentially offered by what are called the "Grandes Ecoles d'Ingénieurs"[5], as opposed to the "mere" University. These "Grandes Ecoles" are usually said to provide a better if not the best education, guaranteeing employability to their graduates [3] and granting greater ease of integration into the elite. However, partly as a consequence, for many students, the choice to study Engineering goes hand-in-hand with a low motivation for the very job of Engineer, as we began to demonstrate last year at the 2011 SEFI Annual Conference [4][6]. A study on the issues of "gap periods" should therefore be addressed with this in mind[7].

This kind of device, called "gap year" in English [6][8], does take different forms and names in France [9], according to the great variety of Engineering Schools and their pedagogical policies

---

[3] A widely accepted definition of "acculturation" was provided by Redfield, Linton and Herskovits in 1936: "those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original cultural patterns of either or both groups" [5]

[4] As well as Jones [6], we think that the term "gap year" is understood to mean periods of not necessarily 12 months exactly (according to Jones: between 4 and 24 months)

[5] From now on, abbreviated as *GEIs*.

[6] This article also provides the reader with more explanations on the specificity of the French Higher Education system. See also [7].

[7] The reader should also keep in mind that in France, as opposed for example to in United Kingdom or Scandinavian countries, the "normal" educational pathway for an engineer is to study continuously, without any "break" between high-school and the final graduation. Some years ago, a "gap year" was simply inconceivable, except for young men having to leave for their military service.

[8] This report was commissioned by the Department for Education and Skills to provide an overview of the policy issues surrounding gap years taken by 16-25 year olds in the UK.

which have been, until now, very autonomous in this respect. Beyond the differences, we found that a good definition, addressing the broad variety of these practices, could be: an *institutionalized extra-curricular period.*

While this kind of practice is widespread in "Grandes Ecoles de Commerce" (Business and Management Schools), it still remains rather marginal in GEIs, but showing rapid increase. In 2008, according to the *Conférence des Grandes Ecoles*[10], only 10% of all Engineering students in France were involved, but by May 2012, already 25% of them had benefitted from such opportunities. Some GEIs do not offer any possibility of this kind to their students; others open this possibility to a larger or smaller number of students (from 5% to 80% of a class), or even encourage their students to take a gap year, in the form of a hidden obligation. Finally, in some GEIs, this "gap period" is clearly compulsory. In the latter case, the gap period is inserted into the five-year curriculum and is part of a carefully thought-out process: the students are asked to carry out projects far removed from their daily social and/or cultural environment.

2.2 A controversial practice

2.2.1 The students' point of view

Many websites dedicated to high school graduates trying to find an orientation for their Higher Education studies, mention, in a clear and sometimes enthusiastic way, the possibility offered by some GEIs to take a "gap period".

According to the Bureau National des Élèves Ingénieurs (BNEI)[11], whose mission is to federate and represent Engineering Students in France, the opportunity to take a "gap period" is clearly a marketing element for the GEIs. The BNEI acknowledges the overwhelming satisfaction of the students who choose to take a "gap period". The main reasons why these students are satisfied are: "a major clarification of their professional project, a better alignment with the labor market expectations, an improvement of their foreign language level, the discovery of other cultures and different ways of working" [8].

But, the BNEI remains very cautious, and even very critical. Here is a summary of the criticism from the BNEI [9]:

- if the gap period is motivated by the acquisition of greater professional experience (through a long term internship), in order to improve employability, then this calls seriously in question the quality of the training provided by the School;
- GEIs which encourage their students to take a gap period for a long term internship are simply trying to free themselves from any responsibility concerning their duty of professional insertion of their students.
- this system is quite unfair for two main reasons: firstly, all the engineering students cannot afford a gap period because, since this device is not really institutionalized on a national level, there is no financial assistance; and secondly, the student has to remain in a "student status" sometimes up to 6 years instead of 5, but he will be hired on the basis of an engineering degree corresponding to 5 years of study. Worse, employers will not hire young engineers who will not have taken a gap year for a long term internship.

---

[9] In French: "césure" at Ecole des Ponts ParisTech, "année jeune ingénieur" at Telecom Sud-Paris and Telecom Bretagne, " stage de formation humaine" at Telecom ParisTech, " stage d'initiative personnelle" at ESTACA, "rupture" at ISA-Lille, "expériment" at ICAM (Lille/Nantes/Toulouse), etc.

[10] Conférence des Grandes Ecoles : http://www.cge.asso.fr/

[11] http://www.bnei.org

- finally, during his long term internship, the student carries out the real work of an engineer, but gets a much lower wage than the legal minimum wage, since he is still considered as a student. This should be deemed as mere exploitation by companies.

In conclusion, we can say that the BNEI raises quite a fundamental issue: is the general satisfaction of students sufficient for the assumption to be supported that the gap years are a meaningful form of pedagogical advancement?

2.2.2 The national institutions' point of view

The *Conférence des Grandes Ecoles* (CGE)[12], which has regrouped, since 1973, the great majority of the Grandes Ecoles, (Engineering or Business and Management) remain between two minds, and do not dare say anything clear on the issue, even if they tentatively question the fact that "the companies tend to look for long term interns" [10]

The *Commission des Titres d'Ingénieur*[13], whose mission has comprised the evaluation and accreditation of GEIs since 1934, is taking a more critical line on this issue: it is forced to note a "real drift in the proliferation of gap years". It asks the GEIs to ensure that "this practice remain marginal" in order to "avoid a systematic prolonging of the duration of the studies" and suggests that they should not communicate on this kind of educational device during their recruitment. Actually, the CTI's opposition relates to a very specific kind of gap period: the completion of a long term internship. Other kinds of breaks (in order to finance the studies or to undertake a personal project) are not under attack. The reasons presented are the following: until now, the freshly graduated engineers without a gap year have no more hiring difficulties, there are no advantages in terms of salary progression, the existing practice of internships is sufficient, even in terms of training abroad, a gap year brings the engineering degree to 6 years of studies with only 300 ECTS credits (6 years of studies should provide 360 credits), and finally, the students in gap year skew the real numbers of students in the GEIs [11].

3 TWO OPPOSING CASE STUDIES

3.1 The case of the various Ecoles Centrales in France

This group encompasses five "Ecoles Centrales": Paris, Lyon Nantes, Lille and Marseille. For many years, there were only two "Ecoles Centrales" in France: Paris and Lyon, the most famous being Centrale Paris, belonging to the 5 top Engineering Schools in France. In 1990, two less-famous Engineering Schools (Institut Industriel du Nord – IDN, From Lille, and Mécanique de Nantes) joined the group and became "Ecole Centrale de Lille" and "Ecole Centrale de Nantes". In 2006, six small Engineering Schools from Marseille decided to merge and join the "Centrale" group, to become "Ecole Centrale de Marseille".

These five Ecoles Centrales are considered as "generalist" Engineering Schools. Altogether, they award 2,100 engineering diplomas every year. The three-year curriculum (after two years of "Classes Préparatoires aux Grandes Ecoles" and a very selective exam) consists of a two-year common part and a third-year specific training chosen among various options (Information and Communication, Applied Mathematics and Information Systems, Physics, Industrial Engineering, Health, Mechanical and Civil Engineering, Energy, Bio-technologies, Automation and Electrical Systems, Management Sciences, Technical Finance [12]). The curriculum comprises three periods of internship for a total of from seven to ten months minimum: four to five weeks of "discovery of the corporate world" at the end of the first year,

[12] http://www.cge.asso.fr/

[13] http://www.cti-commission.fr/

three months as "Engineer Assistant" at the end of the second year, and three to six months to carry out an engineer's mission at the end of the final year.

For the five Ecoles Centrales, there exists the possibility of a gap year, between the second and the third year. This gap year is never an obligation. However the presentation and the official aims of such a device are quite different, depending on each Ecole Centrale. On the official webpage of Centrale Lille, 50 students out of 250 are involved in the current year, and the gap year is clearly described as a "professionalizing training internship": "For one year, the student joins a company before his final year of studies. He will have the opportunity to experience one or several jobs during a whole year and to choose the configuration of his final year of studies according to his career aspirations". On the other hand, Centrale Nantes, on its website, insists on the personal dimension of the gap year; the aim is to "carry out a personal project", in France or abroad, which may consist in "a long experience in a company, a role in humanitarian work, etc." For Centrale Lyon, more than 25% of the students choose to take a gap year, which is defined as a "long-term mission in a company". Centrale Marseille explains in its third-year program document, that "a gap year may be taken before the third year, in order to carry out a personal or professional project". The most interesting case is Centrale Paris: the official website explains that "a gap year is allowed between the second and the third year"; but the Students' Forum provides a great deal of information: "At a 'Meet the candidates Night', around thirty companies come to communicate on accommodating gap year interns. The gap year internship is the first structural experience in a company for students, where they can acquire professional experience, often a determining factor in their future. Various services are offered: a directory of the candidates with accompanying photographs, motivation surveys, a portfolio of the companies, etc. In 2005, 50 students took a gap year; in 2010, there were 100, and in 2012, they are estimated to be 200!

3.1.1 The case of the ICAM Group

The ICAM[14] Group consists of five Engineering Schools, in Lille, Nantes Toulouse, La Roche-sur-Yon, Vannes and Paris-Sénart. The first was created in Lille in 1898 by industrialists in the North region, who asked the Jesuit order to devise and run the pedagogical project. All the different ICAMs in France implement the same curriculum, having about a hundred students in a class. Contrary to the Ecoles Centales, the cursus begins just after graduation from high school, and lasts five years. ICAM engineers usually work in project management, research and development, supply chain logistics, production management and technical sales. ICAM's webpage states: "ICAM remains true to its Jesuit heritage and to the vision of the founder of the Society of Jesus, St. Ignatius of Loyola. Jesuit education strives to seek the truth and to form each student into a whole person of solidarity who will take responsibility for the real world. Our students are asked to have an educated awareness of society and culture, a sense of being interrelated and interconnected, and a commitment to act for the rights of others." The curriculum comprises three periods of internship for a total of at least six and a half months: a one-month operator training after the first year, a "first mission in a company" (technician internship) for at least a month, after the second year, and an "engineer internship" of at least 18 weeks, during the last year of studies.

The "gap period" is called "expériment". It is a four-month compulsory period, at the end of the third year of studies. The name "experiment" is directly taken from the religious training of the Jesuit Fathers[15]. The student is asked to go through intense experiences, not necessarily

[14] Institut Catholique d'Arts et Métiers; www.icam.fr/en/index.html

[15] The "expériment" consists, for the Jesuit novice, in alternating between harsh experiences (such as working as a psychiatric care assistant, or begging board and lodging in order to genuinely experience poverty and

related to his studies, which he will have chosen and prepared by himself. This "expériment" is explicitly part of the curriculum and is hailed by the majority of the teaching staff (non-Jesuits) as an essential element in the overall pedagogical project of ICAM. This experience may take different forms, according to the student's desire[16]. Jacques Enjalbert, Jesuit at ICAM Lille, in charge of the "Pedagogy of Decision" and of the "Expériment", says: "the *expériment* is, for our students, the opportunity to put themselves at risk, to raise issues of meaning and significance (and not only the questions of "what?", "how?" and "how much?"), doing things they dream of… in a paradoxical situation, since they have to really experience freedom whereas this *expériment* is compulsory".[17]

In substance, the *expériment* is organized on the basis of four conditions: 4 months, of which at least 3 months must be spent in the same context; cultural and geographical distance from family and from friends; financial independence; consistency of the project, structured around one clearly identified axis[18]. The *expériment* is prepared both individually and collectively, assisted by a member of the teaching staff. It is explicitly devised as a rite of passage; the departure is solemnized by a meeting of the whole class in the presence of the teaching staff and other classes, as well as a religious celebration (not compulsory). When the students return to ICAM, the expériment is the subject of a personal written report and of small group workshops on sharing and exchange.

4 SUGGESTED PATHS TOWARDS FURTHER AND DEEPER PROBLEMATIZATION

The cases presented above are intentionally very different in order to highlight to what extent a unique label (*institutionalized extra-curricular period*) may take different and even opposite forms, in terms of duration, obligations, setting up conditions, evaluation, etc., not to mention terms of pedagogical and ethical choices, and terms of conception of an engineer's role in our society. But one can find many other schemes behind "gap periods" in France: some Engineering Schools offer non professionalizing gap periods; others require a report and grant the students ECTS credits, etc.

Therefore, our research question is: under what conditions *institutionalized extra-curricular periods*, more and more prevalent in French Engineering Schools, can be considered as true educational forms for future engineering graduates? Under which conditions do these gap years allow them to become -as the French *Ethical Charter of the Engineer* clearly states- "responsible citizens, who make the connection between sciences, technologies and the human community, who involve themselves in civic actions in pursuit of the common good" [13]?

Our first exploratory steps lead us to streamline our questions, as well as to trace the genealogy of these educational devices in the various Engineering curricula, to elucidate why the Engineering Schools began to offer their students such possibilities, if we are to understand their meaning and significance.

---

dependence) and times of peaceful internalization of these experiences, in order for the Jesuit novice to understand who he really is and who he is becoming, and to become true and confident in front of God.

[16] This can range from living three months on the Altiplano with a Peruvian family grazing the llamas, to crossing the Ocean in a sailing boat, or a full-time drift into the universe of design in Paris…

[17] Jacques Enjalbert, interviewed by Patrick Simonnin, Lillle, Febr. 2nd, 2012.

[18] This axis is not the *"what"* will be done, but the *"why"*. The aim of the construction of the project is to help the student to find what he fundamentally desires to experience.

To what extent is the emergence of such educational devices a consequence of the imitation of Business and Management Schools, seen as dangerous rivals on the "market" of Higher Education in France?

To what extent is their diffusion a consequence of the mimicry between Engineering Schools themselves, in a context of exacerbated competition and increasing difficulty in recruiting sufficient numbers of students?

To what extent could the orientation aim of some gap years be a tacit admission of powerlessness in accompanying the students in the process of building their professional project?

To what extent might the emergence of these gap periods be an institutional response from the Engineering Schools to the identification of a new phenomenon (for example, a persisting malaise among the students)?

To what extent can the promotion of such devices be regarded as a symptom of loss of relevance and credibility in Higher Education, even for its most highly prized sector in France, leading it to seek its "raison d'être" in the mere "formatting" of soldiers destined for international economic competition? Taking it one step further, to what extent does an educational tool whose only aim would be to prepare the students to be operational as quickly as possible for private companies, fall within the limits of the mission of an educational institution which survives, at least to some extent, on public funds?

Conversely, to what extent is the invention of a real "break" in the academic curriculum based on an explicit educational project? Even when it is explicitly educational, to what extent is accompanying a student who tries to build his own life project, part of the mission of an Engineering School?

To what extent is a bike trip around the world, or gazing at llamas on the Altiplano, likely to make a student a better engineer for society, for companies, for himself?

More comprehensively, all these questions belong to the ethical sphere, because their underpinning question is: what kind of engineers do the French Engineering Schools claim to "produce"?

We decided to leave all these questions without answers, because, firstly, they would need a much deeper reflection, but we also believe, and hope, that question marks, at this point of our reflection, are more productive than "squared" statements which would not allow for any discussion. Of course, an attentive reader will have already guessed some of our positions; but this is not the main issue here.

In this day and age, where our development models have become less evident, where the concepts of "Sustainable Development" and "Corporate Social Responsibility" are struggling to find real recognition, there are certain fundamental issues that French and even European society must address. Should they be ignored, merely chasing the supposed requirements of private companies, we will be "doing ever more the same things" in a myopic and gregarious way. This will never provide any answer, and sooner or later, it will only result in a dramatic exhaustion and loss of meaning for the whole Higher Educational system.

5 ACKNOWLEDGMENTS

The authors express their thanks to Pr. Colette GRIFFIN, Head of Language Studies at ENSTA-Bretagne, for her revision of the manuscript.

References

[1] Didier, C (2008), Les ingénieurs et l'éthique, Hermès, Paris.

[2] Talin, K, Didier C (2011), Les ingénieurs et l'éthique, 22ème enquête socio-économique des Ingénieurs et Scientifiques de France, Darsch, Ch, Longuet, L (eds), Ingénieurs et Scientifiques de France, Paris, pp. 73-79.

[3] Ingénieur, un diplôme qui ouvre des portes. *L'Etudiant* (May 2012), http://www.letudiant.fr/jobsstages/les-secteurs-qui-recrutent/futurs-ingenieurs-quels-sont-les-secteurs-les-plus-porteurs-pour-vous-13355.html. (accessed on June 1st, 2012).

[4] Simonnin, P, Didier, C (2011), Why, and how, do they choose to become engineers?, SEFI Annual Conference 2011, Lisbon, 28-30 September, http://www.sefi.be/wp-content/papers2011/T6/146.pdf

[5] Redfield, R, Linton R, and Herskowits, M T (1936), Memorandum for the study of acculturation, *American Anthropologist*, N° 38, pp. 149-152.

[6] Jones, A (2004), Review of Gap Year Provision - Research Report RR555, Department for Education and Skills, London, https://www.education.gov.uk/publications/standard/publicationDetail/Page1/RR555

[7] Chatzis, K (2009), Coping with the Second Industrial Revolution : fragmentation of the French engineering education system, 1870s to the present, *Engineering Studies*, Vol. 1, N° 2, pp. 79-99

[8] BNEI (2008), Résultats de l'enquête sur l'année de césure, Paris, http://www.bnei.org/IMG/pdf/Enquete_cesure_-_resultats_definitifs.pdf (accessed on May 30th, 2012)

[9] BNEI (2010), Année de césure – Enjeux et cadre légal, Paris, http://www.bnei.org/spip.php?article622&var_recherche=c%E9sure (accessed on May 30th, 2012)

[10] Conférences des Grandes Écoles (2011), Rapport d'activité / Annual Report 2011, CGE, Paris, http://www.cge-news.com/ra2011 (accessed on May 30th, 2012)

[11] CTI (2010), La CTI et les césures, Commission des Titres d'Ingénieurs, Paris

[12] Groupe des Ecoles Centrales, http://ressources.campusfrance.org/guides_etab/etablissements/fr/pole_centrale_fr.pdf (accessed on May 30th, 2012)

[13] Ingénieurs et Scientifiques de France, *Charte d'éthique de* l'ingénieur (2001) http://www.cnisf.org/page_dyn.php?mytabsmenu=1&lang=FR&page_id=MDAwMDAwMDA2Mg== (accessed on May 30th, 2012)