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Design of a new course aimed at increasing the number of new innovative enterprises

A M Jolly

Professor Emeritus, External Relation Consultant to the Dean
Polytech Orléans, Université d'Orléans, Laboratoire Prisme
Orléans, France

anne-marie.jolly@univ-orleans.fr

F Ros¹

Dean of Orléans Technopole Développement and Orléans Pépinières
Orléans Val de Loire Technopole
Orléans, France

frederic.ros@tech-orleans.fr

C Léger

Dean of Polytech Orléans, Professor
Polytech Orléans, Université d'Orléans, Laboratoire Prisme
Orléans, France

christophe.leger@univ-orleans.fr

C Grillet

Responsible for Education in Management on Polytech Orléans
Polytech Orléans, Université d'Orléans
Orléans, France

carole.grillet@univ-orleans.fr

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INTRODUCTION

Europe does not create enough innovative enterprises. Compared to America, the cultural approach of entrepreneurship is quite different in our countries: in USA, the intention of creating an enterprise is very present in young people's head during their studies and they do not fear failure, which is not the case in Europe. So it is necessary to encourage and to accompany young people towards creation. It is the reason why efforts are made for the creation of new curricula, even at secondary school level.

¹ AM JOLLY

anne-marie.jolly@univ-orleans.fr

It is a fact that the number of enterprises created by Masters and Doctors in Engineering is not very important in France with respect to the number of graduates in these fields.

Encouragements to create an enterprise are a bit more efficient towards people already in activity but young engineers and doctors do not feel enough concerned. In France, APEC (Association pour l'Emploi des Cadres) estimates that only one engineer on sixteen will create an enterprise during its career.

With all the actors of Region Centre we decided to build a one year course inside the engineering school, where people having "an idea" could learn how to lead it towards a new enterprise.

This paper presents the genesis and the content of this course with its specificities linked to sustainable development and the demarche to create a consortium of private and public institutions around this curriculum.

1 CONTEXT

1.1 Europe and France in front of Entrepreneurship

Innovative entrepreneurship is a rare species in Europe: teachers, students and graduates of European higher education institutions seldom see the opportunity to translate their knowledge and education into innovative products and services [1].

As a driver and key element in combining the different areas of the Knowledge Triangle, Entrepreneurship is at the very heart of the EIT vision and activities. One of its challenges is to achieve a shift in the perception and recognition of entrepreneurs in Europe. The EIT was created in 2008 to overcome this innovation gap by creating Knowledge and Innovation Communities. These communities integrate public and private research organisations, innovative industries, higher education institutions, investors and spin offs, establishing new models for education, research and business to work together. EIT KIC InnoEnergy, for example, has created a MSC Innovation and Entrepreneurship where participants learn the essentials of entrepreneurial management oriented towards sustainable economic growth of European companies. Another example or realisation is EIT ICT Labs Doctoral School whose aim is to provide PhD students with the required knowledge and skills on innovation and on entrepreneurship; this takes the form of a double degree where the PhD student is also enrolled in a one year master dedicated to innovation and entrepreneurship.

Recently SEFI [2] and BEST published a position paper on "Engineering Education and the Bologna Process" in view of the 8th Bucharest Ministerial Conference of April 2012, giving a recommendation: "Stimulating entrepreneurship and innovation", remembering us that in the field of engineering, entrepreneurship were a basic preoccupation.

In France, in 2009, the government decided to initiate the "Plan Entrepreneuriat Etudiant"[3] so as to develop entrepreneurship inside higher education establishments. Both ministries of industry and education are in charge of this device. The aim is that each student became sensitive to enterprise culture so as to encourage innovation. This device is composed of three parts devoted to the promotion and real application of entrepreneurial attitude: make sensitive, educate and accompany, that should be integrated in the curricula of the future graduates of higher education. A learning outcomes referential for entrepreneurship has also been defined [4].

In 2010, 20 French "Pôle Entrepreneuriat Etudiant" have been selected after a call for projects, and gifted of 3 million Euros, the creation of the course we present here is part of one of these gifted plan corresponding to the PRES (Pole de Recherche et d'Enseignement Supérieur) Centre Val de Loire association of 2 Universities, 3 "Grandes Ecoles" and some research organisations.

To be more complete on this description of the attempts to develop entrepreneurship, especially in young population, we must say that the authority in charge of secondary schools also develop experiences such as "Mini Entreprise"[5], which is the creation of an enterprise at school by a group of young volunteers, accompanied by their teachers. Since 2004, 1400 mini enterprises have been created in France, this concerns 20 000 pupils. This program has been recognised by the direction on enterprises of European Commission as a "Best Practice in Entrepreneurship Education"

All those initiatives from top to bottom level of education show the importance given by authorities to transversal approaches to increase entrepreneurship at each level of young people.

1.2 Context of the design of this curriculum in our Region and partners involved

The initiatives of IET do not concern so much people but the concept developed can be transposed in the countries and regions. In the field of entrepreneurship: Universities cannot work alone; at the same time, for many years, socioeconomic organisms try, each at one's level, to develop entrepreneurship. Even if we know that knowledge is built in the mind of our young graduates, it is necessary to have the support of experience of all of them.

Moreover the devices created before do not lead to the creation of enough innovative enterprises, so it appeared necessary to imagine other ways, having a look to the initiatives taking place elsewhere and fitting them to our region.

Region Centre has the strategic ambition to include 1200 innovative enterprises in 2015, while in 2008 there are only 500 of them!

In the context of incitation towards entrepreneurship for young students: this course is one part of a global and gradual plan dedicated to increase entrepreneurship. It includes awards given to innovative projects, sensitization modules and other specific actions.

The course was constructed around academic partners: a school of engineering (Master Degree) part of a multidisciplinary University, a school of management part of the same University, a school of design existing in the same city as the University and professional partners: 2 organism including business incubators and transfer of technology, Chamber of Commerce and Industry, Chamber of Experts Accountants, a cluster for innovation and service, banks, Institute for Industrial property, Associations of small and large enterprises, local authorities.

One of the great preoccupations of Region Centre, for many years ago, is sustainable development; we know that it is also the preoccupation of Europe 2020 that aims to achieve a smart, sustainable and inclusive economy in Europe, encouraging innovation for a sustainable growth. In the higher education institutions concerned by the course, the teachings and activities concerning sustainability are already very developed, so we will use these competences of academics and researchers to develop a specific view of societal entrepreneurship.

Much of the partners already had worked before together on projects or other joint courses and so knew each other, this had a very great importance concerning the share of vision for the genesis of this course.

1.3 Some considerations on entrepreneurship education

The lack of spirit of entrepreneurship among our students creates debates in France. When beginning the genesis of a new curriculum, it is impossible to ignore them, and we must use the previous expertise to define an efficient course.

One of the methods to analyse the problem is to have a look on countries that best succeed in the entrepreneurship process, it is the case with Cercle de l'Outre Manche [6] including managers of French and English companies. Through an analysis of the strategy of United

Kingdom to succeed in creation of enterprises in link with Universities and Research, it proposes measures to French authorities. With equivalent population, number of students, and part of the industry in PIB in France and Britain, there are 4 millions more workers in these new enterprises that increase 60% more than French ones, than in France. Since 20 years inside Universities, Brain, Commerce and Money are associated and 20% of the enterprises receiving Risk Capital are born inside the Universities. Between 2000 and 2006, 170 enterprises are born and are still alive in the 6 more active universities.

Some of the measures proposed are under the authority of politic people, but some of them can be easily applied at the local level such as the fact to work at the level of a multidisciplinary poles of critical size (20 000 to 25 000 students), mix engineers and commercial, give the student the desire to create, put students in relationship with private funds, give flexibility towards industry to the research project.

At our level, these elements were a good source of reflexion.

We tried also to take advantage on a more microscopic vision related to students compartments based on experiences already made in course development. Frugier [7] analyses the realism and ethics of the position of managers of a higher education institution to encourage students to entrepreneurship. Though dynamism and enthusiasm are characteristics of young people, a strong faith is that it is better to have a fist professional experience and be reasonable before creating one's enterprise. However, pedagogic activities such as innovation project can, in the course followed before entrepreneurship, give a sense of defy or a play aspect to project construction that can counterbalance a position that seems more reasonable.

The lack of experience of young people is also shared by creators that are no younger, because it appears in fields such as management risk evaluation or experiment of markets. This lack of experience can be counterbalanced by a teaching to specific management of creation and by real accompany in incubators. Moreover, innovation projects compensate the lack of experience, giving concurrent advantages. This would not be the case of projects on very concurrent markets.

The positioning of the course we present here tries, in one's specific way to take in account all these remarks.

2 DESCRIPTION OF THE CURRICULUM

2.1 General requirements and specificities

We tried to design a curriculum that is at the same time interesting and attractive for students of the engineering school and also for other students so as to increase the number of enterprises created in the region bringing great added value in our region. The students can come from one of the masters of the two universities or school engineering included in PRES but also from other Universities of France or French Speaking countries. Moreover it will be possible to follow the course just after the master degree of engineering or during the 2 last year of their PhD, in Orleans we have many research organisms (INRA, CNRS, BRGM) that could create value through start up. There will be also people coming from enterprise in a continuing education demarche. All these people will constitute a mixed public very interesting for creativity.

The course includes the acquisition of knowledge necessary to build an innovative enterprise, skills concerning management of an enterprise, personal development specific knowledge, elements concerning eco-design, innovation by services and creative design, but also the tutoring of the project from the emerging step to the real creation. Each student will have a tutor which is an actor of economic life working in the same area. The aim is to develop also the competences linked to the process of creating an enterprise, and not only the competences of management of an enterprise.

Our specificity is also to include a societal approach and an eco-design approach so as to be sure to build the innovative enterprises of tomorrow.

2.2 Sequences of the course

The first part of the process consists in the selection of the students; it will be done in two phases:

- at first, through a file selection, to be sure that the student has the mandatory level of study (master degree) except for continuing education postulants), the file will also include a motivation letter concerning their project for enterprise creation
- in a second time, an interview in front of a set of people coming from professional and academic worlds will take place. This aims at determining the ad equation of the personality of the candidate with entrepreneurship.

As the course has the aim to give the student not only a toolbox for creating an enterprise but also the concrete elements to do so as soon as the course ends, the professional thesis based on the project of creation will develop the maturation of the project all along this one year course[Fig 1].

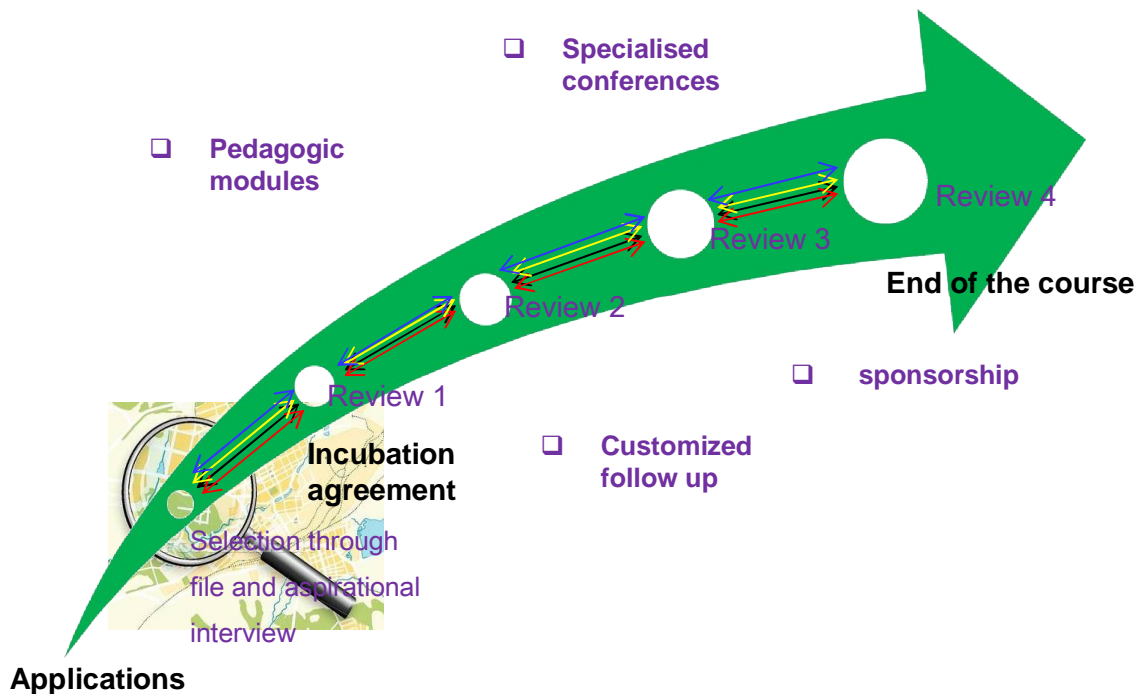


Fig. 1. Sequences of the course

The incubation of the project is discussed between the student and a professional coach of one of the incubator. An incubation agreement is then elaborated which defines a program of actions.

This customised program of action depends on the maturity of the project. It aims at realising or completing the studies of feasibility both on legal, economic and technological point of view. It includes a deep study of all the technologies that have an importance inside the chain of value and also the point of view of intellectual property.

Founding of the project will be also a problematic treated at the beginning of the course because each kind of project can have specific modalities of founding.

The choice of the incubator following the project will also be dependant of the nature of the project.

All along the project reviews of project will take place. Four of them should be integrated in the course.

The first one occurring one month after the beginning is a starting project review.

The second one (five month later) and third one (five month later) will be review to follow the advance of the project.

The last one at the end of the course must be the one of the real creation of the enterprise.

2.3 Organisation

The rhythm of the teaching will allow the student to mature its own project during a full year. Academic teaching takes place at the rhythm of 3 full days twice a month to let plenty of time for professional activities.

Student achieving the course together with their PhD studies will follow the course by half on two years, project reviews being organised during the second year.

The academic part of the course includes three kinds of teaching (Fig 2)

- Transversal teaching
- Basic teaching concerning entrepreneurship (about half of the academic credits)
- Specific teaching concerning Innovative enterprises

These academic teachings are completed by ten séances of support realised by a professional teacher of the same activity sector as the project coached, and by ten séances of coaching realised either by people having created an enterprise or by people that are professionals for accompanying creation projects.

During coaching the students are conducted to ask the good questions concerning either the personal or professional point of view of the creation.

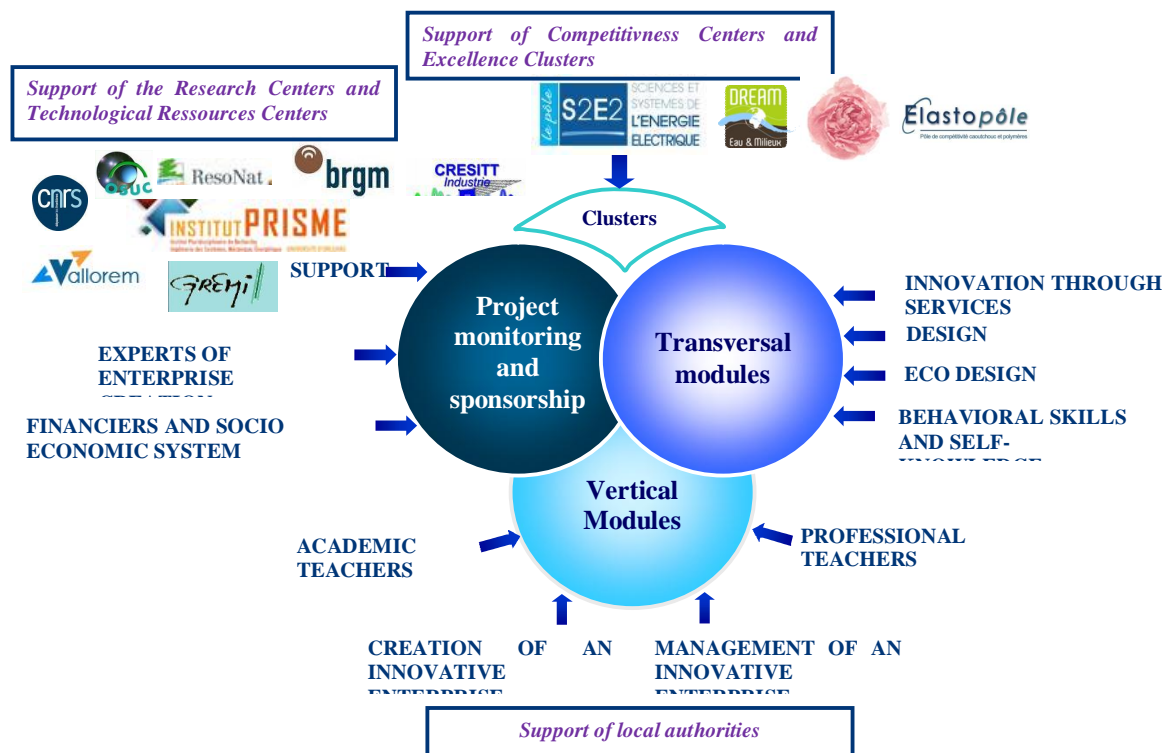


Fig. 2. General organisation of the course

2.4 Modules

In table 1, we give the details of the modules with the number of hours and credits associated.

The teachings linked to sustainability are placed in the category Transversal Teaching.

Table 1. Modules of the course

Name of the Teaching Unit	Conference	Exercise	Practical Work	Project	Total hours	ECTS
<i>Transversal Teachings</i>					64	8
Sustainable Design	12	8			20	2
Eco Design	12	4			16	2
Innovation through Services	12				12	2
Social Responsibility of Enterprises	16				16	2
<i>Basic teaching for Entrepreneurship</i>					196	25
Psychology of the creator		16			16	2
Strategy of development	16				16	2
Commercial strategy and negotiation techniques	14		12		26	3
Team Management	16				16	2
Diagnostic of concurrence: market study	16				16	2
Management of the project of enterprise creation	20				20	3
Law of the societies	16				16	2
Taxes	12				12	2
Law of workers	16				16	2
Accounting and financial analysis	22				22	3
Provisional and budget management	20				20	2
<i>Specific teachings for innovative entrepreneurship</i>					96	12
Innovation	24				24	3
Intellectual property and industrial watch	24				24	3
Strategic development of start up	16				16	2
Founding an innovative enterprise	16				16	2
Marketing of product and innovation	16				16	2
<i>Professional thesis</i>					66	30
Corpus of the project				560		30
Sponsorship				20	20	
Customised coaching				30	30	
Project reviews				16	16	

3 CONCLUSION

The first think that must be said is about the enthusiasm of all people that were solicited during the elaboration of the course: financiers, patron organisations, professionals of incubation and local authorities that decided to grant the students of the course if they really create an enterprise at the end of the course.

Such a course is something new for Doctoral Schools, but it is necessary that mind evolve if we want a real development of entrepreneurship, the fear for a responsible of a PhD student is that this student when concerned by enterprise creation is no more concerned by the research itself. We think that, on the contrary, it will boost its energy and creativity.

Moreover, we think that the curriculum of accredited French Grandes Ecoles is a good preparation for this course because it already includes: soft skills, active pedagogy, and risk management. Our role as manager of this school is to encourage them making them more self confident.

As we told previously, the minds of young people are more prepared to the initiatives concerning entrepreneurship: the generation of pupils having created "Mini Entreprise" is too young to be already in our Universities. But awards to good projects and sensitization actions develop at this moment and entrepreneurship is in the spirit of the time. It could make, we hope, not only students, but also, which is extremely important, their advisors and teacher think: Entrepreneurship, why not?

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