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UDC 378

## Super Courses – a Bridge Between University and Incubator

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Engineering studies are based mainly on projects and implementing solutions and are the most required selection criteria in the industrial market, particularly during economic crisis where finding jobs isn't guaranteed anymore and only Operational engineers can become job creators. To help engineers become future entrepreneurs, super courses or accelerated undergraduate studies are becoming necessary to provide extracurricular experience in a short period of time. Here comes the important role of CDIO standards, which helps engineering students from designing patterns to integrate the professional significantly world.

**Key words:** teaching, learning, accelerated scheduling, implementing, operating.

Today's market has totally changed from a market where you search for a product or a service to a place where only innovators can survive.

To catch-up with this quick transformation, and with the exponential growth of IT and ubiquitous computing, many universities and engineering schools in Tunisia have faced a big challenge ensuring the employment of their graduates.

As a solution, ESPRIT, private school of engineering & technology, started since September 2012 a pedagogical reform that aims to transform some curricula into

programs based on Projects Based Learning (PBL) [1].

The following table 1 summarizes the differences between the classical projects in ESPRIT before the reform and the adoption of the PBL pedagogy.

At the beginning this experience has encountered some difficulties but succeeded afterwards thanks to the investment of stakeholders.

Only 16% considered that it was a bad experience and 17% of the team members have not been able to resolve internal misunderstanding or conflicts.

Table 1. Classical Projects Vs PBL Projects

	Classical Projects	PBL
Nbre of Projects/ Year	1	2
Nbre of Students/ Team	2	5 to 6
Nbre of proposed Projects	100	5+5
Validation	At the End of the Project Development Process	During the Development Process
Monitoring	1 Supervisor/binomial	2 to 3 tutors/ Group (Class)
Academic Projects in Parallel	Yes	No

This successful experience allowed ESPRIT in 2013, to become member of the CDIO initiative and proved that it is preparing a new generation of «operational» engineers rather than mere graduates. This experience has allowed ESPRIT to reach a percentage as high as 72% of its Alumni, being active in medium and big enterprises.

We've also noticed that there are effective smart graduates who are unemployed.

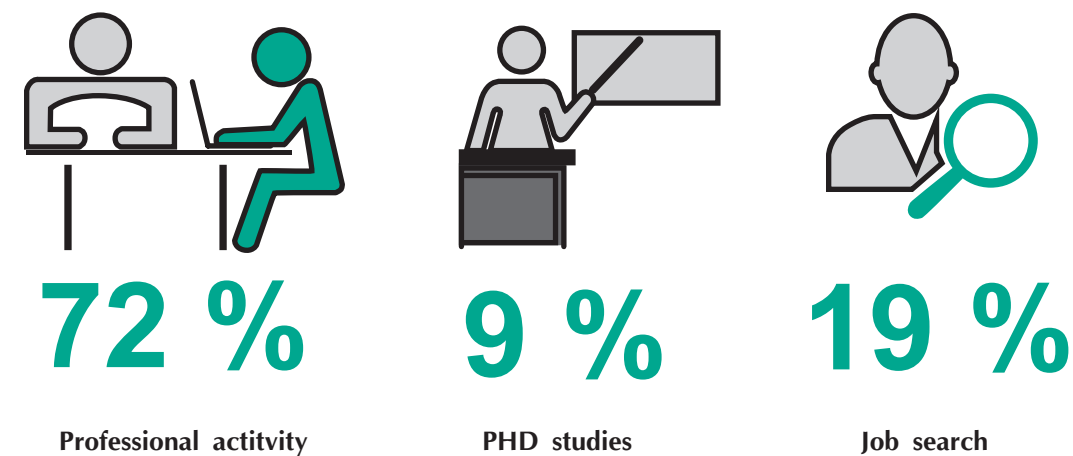
This contrast is maybe due to the economic crisis or the unstable political situation prevailing in Tunisia but ESPRIT didn't give up.

ESPRIT has kept reforming its curriculum by adopting a teaching strategy mostly entrepreneurship-driven. This approach has led the university to fit with the international standards [2] in the term of teaching soft skills like management and marketing using active pedagogy while respecting the number of credits (15% of the curriculum) required by French CTI (Commission des Titres d'Ingénieurs) which allowed ESPRIT to become officially accredited by EURACE this year. (June 2014).

Despite all these advantages among which a good international exposure,

ESPRIT faced a problem with the proposed academic projects, especially the ones that have in their evaluation process «pitching projects», «presenting projects business plans», simulation of market studies or financial projections, yet their cases are not based on real ones reflecting market's situation. The reason behind this is that such projects are credit-driven choices (for credit) and modules are made in a purely academic context. Besides, having these projects as modules made them evaluated like any other module in the curriculum. Indeed problems such as absence or conflicts between team members working on these academic projects doesn't really allow teachers to select the best of their students and to encourage them getting involved in related international competitions and challenges. PBL courses are similar to the milestones projects adopted to follow up the CDIO standards and practice active learning. We have noticed that the majority of these integrated courses are given since the 1<sup>st</sup> year of the engineering studies (2 years before graduation), we consider at that level the taught soft skills and management practices can be forgotten easily once the

Fig. 1. Graduates' status



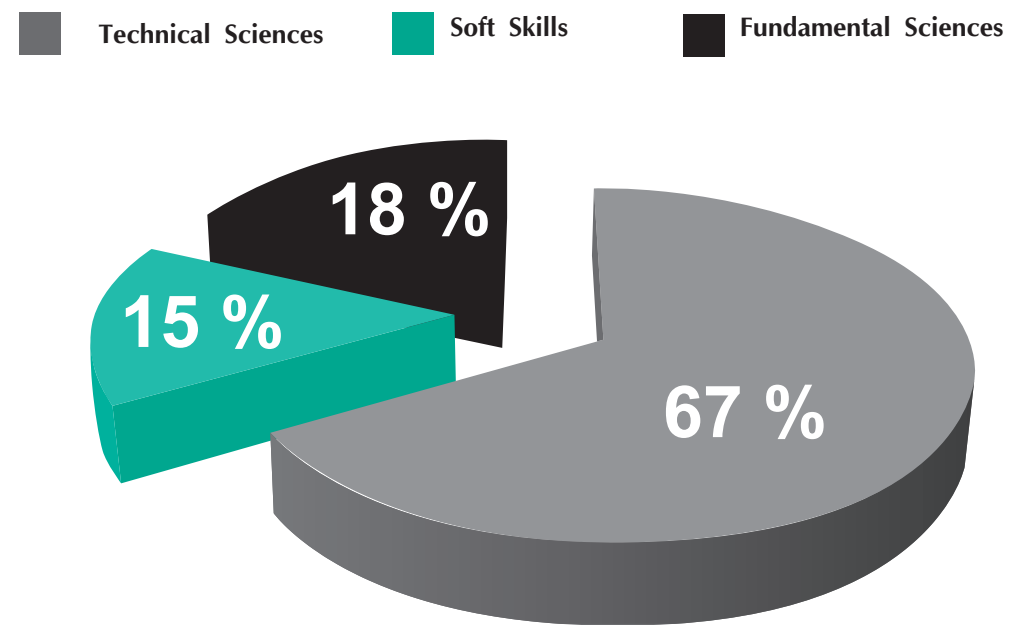
student moves to other modules without keeping practicing these important learning outcomes [3].

Here we can realize the importance of super courses, these extracurricular courses reminding the student these concepts and helping him/her building up his/her knowledge on entrepreneurship by empowering the competences, the engineering skills and also helping him/her thinking about exploiting these outcomes to move from the academic phase to the operating one in a professional manner which can even lead the student to the creation of his/her own start-up. Being aware of the importance of the technology entrepreneurship culture within the engineering curriculum, ESPRIT has worked for the last 14 months drawing the first steps of launching an "academic" incubator. This new and very important entity in the life cycle of the school, will add to the 11 years of shining image of ESPRIT as the First private school in Tunisia.

ESPRIT Incubator has already started its awareness campaign within the campus about its incubator's model and all the process of screening, incubating and graduating incubatees. Despite the fact it is not operational yet, Esprit-Incubator has already signed a partnership with SAMSUNG which is organizing very soon a one month training program similar to super courses teaching best practices managing technology Start-ups meant for potential candidates, which will start next January 2015. The latter will help 24 innovative students (6 teams of 4) and even faculties having brilliant ideas to compete and go through a screening process before integrating this super course and the incubator.

By creating several partnerships and such a professional environment the incubator will certainly help spreading the culture of entrepreneurship and bridging the market environment with its industrial needs to Esprit engineers to be their

Fig. 2. Modules by Category



solution finders certainly. To build this whole ecosystem, academic support has to be brought continuously and in parallel with classical for credit curricular modules. Super courses can prepare motivated students to make their ideas feasible and responding to the market need. In fact, it can be even part of the ideation phase before integrating the incubator [4, 5].

These super courses can be the solution for the discontinuity of the learning process which can cause memory lapse of the knowledge students only learn to have marks or validate credits. This idea is inspired from ESPRIT Incubator partner, Digital Media Zone (DMZ) the academic IT incubator of Ryerson University in Toronto,

Canada, that uses these courses to prepare new generations of future entrepreneurs before leaving the school [6].

So ESPRIT is committed to ensure graduating «operational» engineers among whom few can create their own Start-ups and be Tunisian business leaders in a country where the need is burning.

These super courses are mainly divided into 70% of workshops, 25% of seminars and 5% of the time is about pitching ideas to evaluate communication and soft skills. The evaluating committees are composed of experts, coaches and businessmen who got a deep knowledge about the market needs and are able to guide students build their business models and plans.

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