

Report from the study visit to the Politecnico di Torino, 26th-27th May 2011

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1. Politecnico di Torino: overview

1.1 History, structure and key numbers

The Politecnico di Torino was first established in 1859 as the Technical School for Engineers. In 1906 the Regio Politecnico di Torino was founded in its current form. The Politecnico is globally ranked amongst the top 100 universities in Engineering (57th place in the Shanghai Jiao Tong University ranking). The mission of the university focuses on five points: training, research, technological transfer, services for the local area and finance. The Politecnico has a long tradition of collaboration with the industry (particularly, in the past, with FIAT), which helps their graduates find a job quicker: 80% of graduates are employed within a year from graduation, compared to the 61% average for Italy.

The Politecnico is governed by the Rector, the Academic Senate and the Board of Governors. The Rector acts as the Chairman of the Academic Senate and the Board of Governors. It has three Vice Rectors in charge of the Third Mission of the Politecnico:

- Vice-Rector for support and Initiatives in Social Integration and Rights of Disabled People;
- Vice-Rector for Special Projects and Professionalizing Education;
- Vice-Rector for Cultural Initiatives.

The Politecnico consists of four Schools of Engineering, two Schools of Architecture and the Graduate School, which was set up in 1998 to overlook all aspects of graduate studies. The 18 Departments of the Politecnico organise research in a wide range of scientific sectors. Teaching is organised in such a way as to overcome departmental boundaries, allowing more flexibility. The Departments include:

- Control and Computer Engineering
- Electronics
- Electrical Engineering
- Energetics
- Aerospace Engineering
- Housing and City
- Physics
- Mathematics
- Mechanics
- Human Settlements Science and Technology
- Architectural and Industrial Design
- Building Engineering and Territorial Systems
- Materials Science and Chemical Engineering
- Production Systems and Business Economics
- Structural and Geotechnical Engineering
- Land, Environment and Geo-Engineering
- Inter-University Department for Territorial Studies and Planning
- Hydraulics, Transport and Civil Infrastructures

The Politecnico offers thus two main types of Interdepartmental Centres: those whose functions are crucial for the organisation of the whole university (Architecture Interdepartmental Teaching Services, Politecnico Library System, Centre for ICT Services and Centre for Distance Learning and Multimedia), and those relevant to the organisation of teaching and/or research in a specific geographical area or in one specific research field (Prototyping Centre and Politecnico Centre for Quality).

In 2009/2010, the Politecnico had 29,300 students (65% undergraduates and 35% graduates) and 900 academic staff (30% Professors, 42% Assistant Professors and 28% Associate Professors). In 2010/11 it offered 53 educational programmes and 124 courses (2007/2008). Its budget for 2010 was 380 millions euro, out of which approximately 70% comes from partnerships with public and private institutions. Currently there are approximately 3,550 international students studying at the Politecnico and 3,100 internships are offered to the students. In addition, the Politecnico has 340 international cooperation agreements.

The main research areas include industrial engineering, information technologies, civil/architectural engineering, environmental engineering, management engineering, architecture and industrial design. Research activities focus especially on ICT, sustainable energy, automotive, nanotechnology, aerospace and aeronautics, environment, and management.

2. People met during the study visit

During the visit to the Politecnico di Torino we met the following persons from the university staff:

- Prof. Enrico Macii, Vice Rector for Research, Technology Transfer and EU Affairs
enrico.macii.@Politecnico.it
- Prof. Patrizia Lombardi, Full Professor, Planning and Economic Evaluation
patrizia.lombardi.@Politecnico.it
- Prof. Mario Calderini, Professor of Innovation Management. Consultant to Ministry of Education
mario.calderini.@Politecnico.it
- Mr. Shiva Loccisano, Research Contracts and Industrial Liaison Office
shiva.loccisano.@Politecnico.it
- Mr. Alberto Cuttica, Research Contracts and Industrial Liaison Office
alberto.cuttica.@Politecnico.it
- Prof. Fulvio Corno, Assistant Professor, Responsible for e-learning
fulvio.corno.@Politecnico.it

Our main host was Professor Patrizia Lombardi, who accompanied us during the two days of the visit.

Most meetings took place at the Rectorate offices of the Politecnico on the 26th and 27th of May 2011. Several people attended the meetings and were interviewed.

Two areas were visited. The first one was the Centre for Distance Learning. This centre leads an innovative initiative centered on giving online support for undergraduate students. The centre has an extensive scheme of lectures recording and distributing (via web) for distance learning but also for regular students who want to enroll in the program, called 'Politecnico online'. While the program is now conceived mainly for undergraduate level, there is a great potential for it to develop as support for postgraduate students and CE activities.

The second area visited was the I3P Business Incubator. We visited the facilities and met the staff responsible for this area (Mr. Loccisano and Mr. Cuttica, who previously had attended one of the meetings in the Rectorate Building). They showed us the facilities and outlined the results achieved by the Business Incubator.

3. Comprehensive features of the Best Practices

3.1 Description of the Best Practices and of the most successful projects

- (a) **I3P Incubatore Imprese Innovative Politecnico, Torino.** The I3P, founded in 2000, is the main Italian university-based incubator and one of the leaders at European level. It is a non-profit joint-stock *consortium* funded by the Politecnico of Torino, the Provincia di Torino, the Chamber of Commerce of Torino, Finpiemonte, the City of Torino and the Torino Wireless Foundation.

Its mission is to promote the creation of new science-oriented firms with high-growth potential. The activity of I3P follows the global strategies of the Piedmont region, in order to sustain research, technology innovation and new entrepreneurship. Specifically it aims to:

- provide consulting services during the enterprise creation process (these services are free of charge);
- manage a network and a high profile marketplace involving entrepreneurs, managers and investors;
- provide a location for enterprises to create reciprocal synergies.

I3P is open to students, researchers, Politecnico faculty members and members of other research bodies, enterprises which plan to create spin—offs for the exploitation of research results, and anyone else interested in the creation of a knowledge-based firm and which could benefit from being located at the Politecnico and Cittadella.

The companies located in I3P pay a monthly fee inclusive of all services (consulting, real estate, financial advisory, networking etc.). The fee is aligned to the market rate and it is increased with time according to the growth of the company. In some cases, I3P can ask for a percentage of the turnover in year 4 and 5 after the company leaves the incubator instead of the fee. In this way the incubator shares the risk with the company.

The incubation period lasts three years, with a possibility of a one-year extension. The incubation process is shown in Figure 1:



Figure 1: Incubation process

The incubator offers the following services:

- tutoring on ideas and start-ups, and support in business plan development;
- technical, managerial, administrative, legal and intellectual property consultancy;
- team building;
- support in accessing public funding and R&D;
- special relationships with banks, helping securing loans at preferential conditions;
- links with equity investors (business angels, firms, Venture Capital funds);
- networking with local enterprises and employers' associations.

Up to 2009, I3P created 336 hi-tech start-ups; its companies generated over 78 million of aggregate revenues, employed 1,462 people and registered 134 patents. 80 out of 140 companies that went through the incubator survived in the world outside the incubator.

The Politecnico is one of the recognised Italian Patent Information Points. In 2004, I3P won the 3rd Edition of the “Best Science-Based Incubator Award”, in which more than 50 incubators participated.

(b) **The Cittadella Politecnica.** The main project of the Cittadella Politecnica (Polytechnic City) endeavours to conceive a new role and a new strategy for the Politecnico on the regional territory and to provide spaces for productive and directional activities; at the same time, the project provides services for companies, universities and citizens, implemented by research and didactic activities. The main objectives include:

- become a top quality centre of research and education and encourage initiatives in favour of the social knowledge of science, technology and innovation;
- create a systematic and structured offer of long-term education;
- give space and encourage multidisciplinary initiatives of education;
- create a Torino Business School with the Athenaeums of Piedmont, the entrepreneurial associations, the Banking Foundations and the Region;
- offer integrated services.

The Cittadella Politecnica project is localised on the areas of the “Former Workshops Great Repairs” and owns 170,000sqm of space close to the main campus.

- (c) **The Politecnico Business Research Centre.** The centre, located in the Cittadella, offers modular spaces for offices, laboratories and factory facilities to create a common workspace to be shared with industries. It aims to develop permanent relations with companies which want to work with with universities to foster innovation.
- (d) **SARTT – Support Area for Research and TT.** It involves the following activities: fund raising (from EU, national and international sources); patent management; spin-offs; coordination activities and Innovation Front End (marketing included), promotion and dissemination.
- (e) **Other activities.** During the interviews with Politecnico staff we identified a number of other Third Mission activities. Professor Calderini observed that the most important channel of technology and knowledge transfer at the Politecnico and other Italian universities is private consultancy carried out by individual professors. The consultancy is usually carried out in one of the following three ways: (a) full time professors can act as private consultants, but can only engage with companies approved by the Politecnico; (b) companies pay the Politecnico, which retains 30% of the money and devolves the remaining 70% to the professor; (c) part-time professors, whose salaries approximately correspond to 30% of the full time professors', can work with companies on an unpaid agreement (there are some time limitations imposed, but no authorisation is needed). The number of part-time professors is a good indicator of the level of this type of activities. Other activities include organisation of events open to the public, students teaching computer skills to the patients of trauma departments, Masters Programmes designed specifically for industry, etc. For the time being there is no structure for Social Engagement activities at the Politecnico.

3.2 Creation of Third Mission activities

According to Prof. Calderini technology transfer activities have been emerging in the bottom up process rather than being driven by the top down policy. There has been almost no open discussion about third mission at an institutional level – it seems as if the subject is avoided- while at the same time several people are involved in the activities that can be described as third mission. However, according to Prof. Calderini, the individuals involved in these activities are not clear about their motivations for committing to them: perhaps it is because they are interested in royalties, or perhaps because they want to manifest their capabilities, or alternatively because everyone does it. In Prof. Calderini's opinion, there is no political consciousness and intentionality in technology transfer, it is done upon private individuals initiative.

The Technology Transfer Office (TTO) at the Politecnico was created as part of a national initiative. The Piedmont region universities received an investment for the creation of the TTO. Prof. Calderini was in favour of creating one TTO for the three universities in Piedmont. However, the institutions involved decided to divide the funding and create each one its own TTO.

3.3 Positive and negative components affecting the raise and the development of the Best Practices

The factors of success identified during the visit are:

- campus location in the middle of the city, which facilitate good connections with the city and its institutions and companies;
- high levels of specialisation;

- long tradition of relationships with industry, such as FIAT and GM; for a long time FIAT had a strong influence on the city and the Polytechnic, which also had negative effects, such as Polytechnic being a school without Arts, Humanities and Business departments;
- culture of ownership and loyalty to the Politecnico, which can be linked to its military traditions.

Prof. Calderini emphasised the importance of policy cycles and learning from failures in the implementation of policy in regard to Third Mission projects. Sometimes wrong policies, or right policies introduced at the wrong time, can refrain an institution from considering different options and developing a better understanding of the issues related to Third Mission projects. It has been evinced that an initial amateur phase may facilitates later professional development.

Prof. Calderini also stated that policy makers need time to develop an understanding of Third Mission activities. He gave the example of the ‘fake incubator’, meaning that no companies failed in it and therefore didn’t virtually need the ‘incubation’ period. In his view if no companies fail they are not innovative enough, which contradicts the purpose of an incubator. However, from a political and psychological perspective, the success of the incubator gave confidence to the decision-makers and made it easier to support those decisions, proving to be a positive experience for the development of TTO.

The main issue remains the lack of human resources, along with the disproportion between the expectations of the decision-makers and the resources employed to achieve them.

3.4 Characteristics of the relationship between the specific structure enquired and the university

Currently, Third Mission activities comply with several internal regulations, for example the authorisation of full time professors. However, no university policy on Third Mission has been conceived of.

3.5 Relevance of the public institutions attitude towards the University Best Practices

The national policy strongly promotes Third Mission. The first national policy was introduced in 2001 by Berlusconi’s government and the first intentional effort was the setting up of the Patent Commission, whose purpose was the evaluation of patents. In 2006 there was an initiative for setting up TTOs at Italian universities. The importance of Third Mission projects is emphasised at all government levels, including national, regional and local. It has been highlighted that the expectations placed on universities in regard to their role in social and economic development are often almost unrealistic, especially at the local level.

An agency for evaluation of universities in Italy has been set up recently and their first activity will be the measurement of Third Mission activities.

3.6 Future perspectives for Third Mission activities in the institution

The Politecnico has committed to Third Mission activities in its Strategic Plan 2007¹. The plan, in the Strategic Line 6 “Strong ties with institutions, enterprises and professions”, reflects the national and international policy drivers of Third Mission projects:

“Recent policy guidelines regarding development and innovation support, both on the national and international scale, emphasise the core role of academic institutions in local development processes. In particular, such guidelines affirm the need to define a model for involving universities in processes regarding the social, economic and cultural development of local systems, comprehensively structured to encompass the many and diverse occasions in which associations between the academic system, institutions, enterprises and professions translate into the transfer of knowledge, technology, values and behaviour and governance models.”

It also states the Politecnico response to the policy guidelines emphasising its commitment to Third Mission and Technology Transfer:

“Enhancements of the quantity and quality of the relations with local institutions, as well as with the entrepreneurial and professional world, standing recognition of its own infeasible decisional autonomy, is therefore one of the University’s principal strategic axes and may be structured in a number of major lines. For this purpose, the University intends to affirm its commitment in support of technology transfer, and in particular of the human resource aspect, encouraging researcher mobility between the academic institution and the entrepreneurial world, the creation of joint laboratories, the enhancement of existing public and private laboratories and the joint definition of learning paths of mutual interest. (...) The University proposes to support intense modes of technology transfer implementing, alongside the process of spatial proximity between universities and the entrepreneurial world, which is in progress within the Cittadella Politecnica, advanced form of proximity, based on the consistency of specialisations, lexical and cultural homogenisation, and on the shared definition of abstraction plans and of positioning inside the research stream.”

The Strategy identifies four actions in order to achieve the Strategic Line 6:

- promotion of cooperation between Politecnico and enterprises, also through spatial contiguity;
- definition of learning path in conjunction with the entrepreneurial, professional and institutional world;
- improvement of exchanges between the University and bridging institutions;
- protection and valorisation of intellectual property.

Another aspect related to Third Mission activities covered by the Strategic Plan is the “Creation of University spaces open to the local community”. This initiative is related to the Politecnico’s plan to take part in a new territorial strategy in order to enhance its role as main actor in the development and economic growth of the Region and to support technological innovation of production processes and the creation of new professional expertise.

4. Measuring and evaluating Third Mission activities

4.1 Presentation of the project

¹ Politecnico di Torino, *An International University for local development*, Strategic Plan, June 2007.

All the People contacted during the visit had received all relevant information about the project in advance. This consists of a brief summary of the targets, phases and progress which should be expected from the Third Mission (E3M) project.

The E3M project was presented to university staff members in an initial meeting attended by Professor Macii, Vice-Rector for Research. The presentation outlined the objectives and concepts related to the E3M project, the work hitherto concluded and future tasks. During this meeting, as for other moments of the visit, the attending audience expressed doubts, asked questions and made suggestions, creating a vibrant and engaging debate.

4.2. Information about indicators.

After a general review of the indicators set selected for the E3M project, the debate about applicability and relevance of this set to the Politecnico di Torino gave us an important feedback on the opinions, feelings and problems that the use of these indicators may incur to in this institution.

The general opinion of the people contacted is that all indicators included in the proposed set were relevant and interesting. Regarding some of the indicators, staff members commented that at the moment the Politecnico does not have the necessary information to calculate them; however, they still considered the information given by these indicators highly valuable. This issue affects some of the TTI indicators, as TTI is managed by the Politecnico and its academic staff (which leads to high decentralisation, freedom for part time staff to commit to contracts with companies, etc.).

There were also some comments about the need to clarify some concepts in the indicators set, for example to define more precisely which is the target audience for University events with projection to the community, specifically indicating that the audience to consider does not belong to the University.

This decentralised approach also affects CE activities. There is not a central service to coordinate and manage CE courses and seminars. Instead, the organization of these programs is left to the Departments, Faculties and the Politecnico. For some activities, authorization is automatic, resulting in the fact that frequently there is no record about them. In those cases all information on participants, staff involved, etc, are difficult to collect and, when collected, incomplete.

4.3. Opinions from interviewed staff

One of the doubts raised concerned the lack of an indicator covering the political influence of the HEI in its city or region, through the presence of persons from the HEI staff in institutions, political bodies, etc. On the same hand, attention was brought to the possible interest of including indicators about cooperation with external Public Institutions and in the definitions of regional political strategies.

Moreover, some proposed the inclusion in the indicators set of regulating norms which would address TTI activities of academics. Prof Calderini commented that the creation of these regulations is a necessary step to achieve a wide involvement of academics in TTI activities. The debate about the modalities of TTI activities at the Politecnico showed us the wide variety of situations, different from one HEI to another, that any ranking and indicators set has to face, and has to be able to consider and measure.

Furthermore, the debate concerned two opposite tendencies remarked at the Politecnico and in other HEIs. On one side was noticed the tendency in political and academic governance bodies to emphasise the relevance and interest of Third Mission activities for the community and the universities. On the

other side, it was remarked the reluctance of academic staff to engage in Third Mission activities and to include these as part of their regular tasks. In this perspective, indicators evaluating the participation in TTI and CE were considered very important.

Moreover the debate included the need of distinguishing between the different types of HEI. In this case, the differentiation should be undertaken not only by disciplines, but also considering the entrepreneurial orientations of each HEI. Comparing HEIs from different disciplines, and with different Missions, can prove to be difficult and not necessarily relevant.

Another concern which was raised was the difficulty of establishing clear limits between the three Third Mission dimensions. As an example of this, Prof. Corno mentioned several research projects which were highly relevant to Social Engagement.

Finally, it was remarked the absence of indicators related to Alumni associations and Associations for service to community. Prof. Lombardi suggested it could prove to be constructive to include some indicators of this kind, as a measure related with SE. Also the lack of environmental engagement was commented upon, as well as the convenience of considering environmental impact reports for university activities.

Two final points which arose throughout the meetings were: 1) the interest of measuring not only the activities but also the impacts caused by this activities, and 2) the convenience of including indicators related to the Information Society (use of webs, participation in open access initiatives, etc.).