

University Cooperation with the Local Palestinian Industry:

Example of Faculty of Engineering at Birzeit University

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Cooperation tools and mechanisms with industry

Statistical data shows that the Palestinian industrial sectors work at less than 50% of their real capacity, which makes it difficult to create a successful industry without cooperating with academic institutions in Palestine. University-Industry cooperation is thus a top priority in the university sector and has a specific strategic importance at Birzeit University (BZU).

Birzeit University's main tools of cooperation with local industry include the following;

- Scientific visits and student training: Four-year students have to undergo six weeks of practical training in local firms or industry, working in the engineering field.
- Graduation projects: Final year students have to complete a one-year project (five credit hours). The local industry and engineering community can be engaged in selecting or suggesting topics or projects. They can also be part of joint supervision and the final evaluation of student projects.
- Consultancy: Faculty members can offer consultancy to various companies in their field of expertise.
- Joint projects: Industry and faculty can formulate and seek funding for joint projects of mutual interest. Which might include development of products, production, training of engineers and technology transfer.

A glimpse of the Birzeit University Faculty of Engineering and its cooperation with industry

The Faculty of Engineering at Birzeit University was established in 1979. Currently, it houses four academic undergraduate engineering departments: Civil Engineering, Architectural Engineering, Electrical Engineering and Mechanical Engineering. The Faculty of Engineering is also providing six graduate programmes leading to Masters degrees in different disciplines.

The Faculty of Engineering houses a group of specialized laboratories. The labs are used to conduct certified tests in the fields of water and civil engineering. The faculty also has a Virtual Reality Gallery used for educational presentation purposes.

The Faculty of Engineering has several interactions with the local community and industry. Multi-disciplinary memoranda of understanding (MOU) have been signed between the faculty and specialized companies and associations like the United Motors Car Company (UMT) and the Palestinian Sustainable Solar Energy Association (PSSSES), Jerusalem District Electricity Company, Nassar Stones and many others. These memoranda lead to close and deep cooperation that aims at developing local markets in Palestine.

Specifically:

-The Mechanical Engineering department organizes two industrial visits per year for fourth and fifth year students to factories in the Nablus, Hebron and Ramallah industrial areas. The department is participating in a TEMPUS project with the Palestinian Federation of Industries that will establish a Master program in sustainable production and quality engineering.

-The contribution of the Electrical Engineering department to the local market is concentrated mainly on the cooperation with Jerusalem District Electricity Company (JDECO), the main provider for electricity in Palestine. Most of electrical engineering students get their practical training in the different sectors of the JDECO while a few students get their training in other local telecommunication companies every year. The staff of the department participated in the design of the SCADA interface system that has been used by the Electricity Company to reach electric switches of the net remotely and easily (see case study below).

-The Civil Engineering department contributes to the building and construction sector, which is considered the biggest in Palestine. One of the main contributions of the department is introducing a modern concrete technology in the Palestinian construction field, in cooperation with the Palestinian Concrete Association and the Palestinian Association of Engineers. The department concentrates on training students on Building Information Management (BIM) in cooperation with local and international contracting companies and municipalities. The department also participated in a project aimed at utilizing stone dust in further industrial activities, in cooperation with Nassar local company and the MIT institute (see case study below).

-The **Department of Architectural Engineering** has signed MoUs with Ramallah Municipality, Riwaq Company, Friends school, and many others. The activities of these agreements include holding seminars and workshops, development of public parks and gardens, and participation in the Building Information Management project with the CCC Company.

Case study 1: Cooperation with Jerusalem District Electricity Company

The Faculty of Engineering has participated in a project about Supervisory Control and Data Acquisition (SCADA) in cooperation with Jerusalem District Electricity Company. This project aims at presenting a solution for the lack of ability to control devices by SCADA, to understand SCADA protocol and to map them to control interface devices.

The main outcome of the project is building an interface unit card between the SCADA system and the controller of Auto Recloser. The interface has the ability to transmit a command control from the SCADA server to the Auto Recloser and from the Auto Recloser to the SCADA system, hence allowing communication between the SCADA system and the system components.

Case study 2: Cooperation with the Nassar Stone and Marble Company

The Faculty of Engineering has established a three year cooperation project with the Nassar Stone and Marble Company. The project aims at using the waste powder that comes out of the stone cutting in concrete industry. The Calcium Carbonate waste powder that results from stone cutting is considered one of the sources of environment pollution. Stone factories afford high expenses to get rid of these wastes. Other researchers and investors tried to use these wastes in other industries like plastic and cement industries but this did not have take-up in the local market. The university finds this powder to be a good material to be used in ready-mixed concrete. The university signed an agreement in which the company is responsible for providing the materials and funds for the project, while the university is responsible for preparing the research staff, methodology and implementation. The initial results proved that using this powder in concrete leads to a more workable and stronger mixture and smoother surfaces. In addition, reducing the quantity of sand used in the mixture by replacing it with stone powder leads to cost reduction. This project is considered one of the ‘green’ projects because it leads to reduced air pollution and usage of wastes as industrial material.

Next steps: Developing a Cooperation center with industry

In light of these activities, BZU intends to establish a contact point in the university in the form of a ‘synergy center’ for cooperation. This contact point aims at strengthening the relations of the

university with industry and broadening the possibilities of scientific research that can be funded directly by industry to solve existing industrial problems, instead of depending on costly external experts. Another objective is to raise the level of scientific research in the university to international levels and support knowledge exchange between academic staff and local engineers.

The specific goals of this center are summarized in the following:

- 1- Solving the automation problems in production lines, in cooperation with the mechanical engineering, electrical engineering and mechatronics staff.
- 2- Cooperation between the Jerusalem District Electricity Company and electricity companies and the to the electrical engineering department to solve the different problems that arise in modern and scientific techniques.
- 3- Active participation in the design and execution of public and private buildings and construction, and contribution to urban planning for cities.
- 4- Maintaining the Palestinian heritage and culture by providing local projects with the best architectural design for the landscape.
- 5- Holding seminars and training courses for engineers working in the local market.

In addition, students can be supported at an early stage with practical training, which will lead to quick and more efficient employment with local industry.

The center would be led by a consultancy supervising committee for cooperation with the local community. This committee will be responsible for the contact with the industrial and commercial enterprises in the Palestinian local market.

The expected outcome from this center is to ameliorate the overall scientific level of both industry and the university, by generating fluid collaboration. The cooperation center and its staff will be made sustainable through nationally and internationally funded research projects.

Conclusions

This short article emphasizes the importance of deep cooperation between the Birzeit University Faculty of Engineering and local industry, and serves as an example of cooperation between academia and the private sector. Cooperation already exists in a few fields but it does not reach to the required level for truly enhancing Palestinian industrial activity. Increasing and strengthening this cooperation can lead to better industrial development by increasing the overall scientific level and productivity of local factories, leading to a better industrial reality. However,

development of new laws to facilitate the culture of cooperation between industry and the academy is still needed. The role of state here is critical, as it can increase trust and confidence between universities and industry and decrease the gap between research institutions and the local market.

Comments by the NEO in Palestine:

Ahmed Abu Hanieh is a Higher Education Reform Expert (HERE) member in Palestine. He started this work depending on the results of a national Tempus project called Career Oriented Curricula Development for Road Vehicle Maintenance (CODE). Thanks to this project, many cooperation agreements and research partnerships were established between Birzeit University and the local car dealers in Palestine. Abu Hanieh as a HERE member also participated in other European projects like the Middle Eastern Partnership in Sustainable Engineering (ME-Eng). This project as well, started serious relationship with the general Palestinian Federation of Industries that make a link between BZU as higher education institution and local enterprises and companies. Abu Hanieh is a board member in the Higher Council of Innovation and Excellence in Palestine. This council was founded and supported by the Palestinian president office to encourage innovation in Palestine. The innovation activities expanded to include some small companies and enterprises that organize innovation competitions for school and university students. These efforts aim at reclaiming the gap between academia and industry and establishing new research projects to solve the real problems facing local market in Palestine.