USING INTERNSHIPS TO ENHANCE ENGINEERING PROGRAMS – THE CASE STUDY OF AN INDUSTRIAL PARTNER

Antoine Côté

Département de mathématiques, informatique et génie, Université du Québec à Rimouski
Antoine.cote@uqar.ca

Many institutions recognise the importance of internships. As part of the training of future engineers, these opportunities confront students to the realities of job market. The University studied in this case is one of those institutions. It has developed its way of integrating internships with the engineering bachelors degree.

The University in question gives high importance to practical knowledge. As third and fourth year students complete their studies, they are asked to manage full-scale projects – from Design Brief to assembly, along with Plans and Specifications. These courses are bound to the University's engineering Chair, who accompanies students in their design process. All subjects come from real customers who either have heard of the Chair, or discovered it via internships. In fact, a major part of the Chair's clients comes from partnerships developed in summer time, outside of the walls of the University: the confidence and trust built in internships propel the program. Recently, this symbiosis was brought up to a new level.

The University is equipped with a high power (3 kW) fiber laser. Mounted on a six-axis robotic arm, the laser cell is reserved to graduate level studies. It was originally built for heat treatments and welding. The cell attracted a second year bachelor student in the last months. As he was completing an internship in an industrial research center, the chief of the laser division team approached him. The head of department wanted to create a contest linked to laser technology – most specifically, their industrial applications.

Actions were rapidly undertaken. As the student accepted, he contacted one of his professors and convinced him to embed the contest to two courses as experiments. The chosen subjects were laser heat treatment for the materials course, and autogenous welding, for the automated production systems course. From mid-summer to autumn, protocols were drawn up in close cooperation with the research center. As the internship ended, the project continued using the University's metallographic characterisation machines. Being newly acquired

equipment, they permitted students and auxiliary teaching staff to familiarise themselves with it.

Steps towards the project stimulated the University to hold a training session on the laser cell. In the past years, only post-graduate students were acquiring experience; as studies advanced, they were becoming the only experts available. It was a real problem, since all knowledge was vanishing with the graduation and departure of students. To counter this situation, educational assistants were given an advanced training of the cell – part of which was organized and given by the research center linked to the emerging contest.

By November, everything was finished. About 50 students from first and third year completed experiments and interacted for the first time with the cell. As manipulations advanced, the group was brought to the research center where they could benefit of high-end technologies to complete the tasks. The activity was a real success, as students could clearly establish links between theory and industrial realities. A promising partnership was also established.

As proven by this experience, institutions could benefit a lot from students' internships and should therefore put in place incentive measures. As future engineers, graduates will play a major role in public protection. Going beyond basic conceptualisation therefore isn't just interesting: it becomes indispensable. Universities can't possess all technologies that the future Engineer will come across; linking programs with industries gives access to new possibilities and a glimpse of day-to-day reality.

While some establishments already tint their curriculum with industrial contexts, many should make use of opportunities created with students to supplement their programs and adapt their course offer. Involvement could even come from recent graduates, while links with professors are still fresh. Universities really should encourage students to keep contact with them.