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Cultivating intelligence: École Polytechnique de Montréal's new library

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Abstract

More than just a book repository, the new library at École Polytechnique de Montréal can be better described as a hotbed of intellectual activity. The library was specifically designed to foster learning, encourage research, facilitate collaboration and stimulate new ideas through its combination of technology, information, science and culture.

From spatial planning to equipment to furnishings, everything was designed around the idea of an “intellectual forum.” This article presents the process by which the idea became reality.

Keywords: University library, design

1 Introduction

In our 1999-2003 strategic plan, we had already announced our intent to transform the library into a focal point that would stimulate student life and intellectual curiosity.

The existence and promotion of this idea within the Polytechnique¹ community played a determining role in the events to come. It was only three years later, in March 2002, that the School obtained permission to construct a new building. Our strategic positioning, by then well established, made the library an ideal candidate for incorporation into the new space.

The vision informing our design was the following: “Located at the heart of the Polytechnique campus, the library is an intellectual forum where technology, information, science and culture come together to foster learning, research, collaboration and the proliferation of new ideas.” The user was central to the design, as was our wish to see the facility evolve from document repository to social and intellectual centre. As proof, witness the approximately 17% of additional floor space in the new premises that has been given over entirely to public space.

¹ Founded in 1873, École Polytechnique de Montréal is one of Canada's leading engineering institutions in terms of both teaching and research. It is the largest engineering school in Québec as far as its student population and the scope of its research activities are concerned. École Polytechnique provides instruction in 11 engineering specialties and is responsible for more than one-quarter of university research in engineering in Québec. The school has 220 professors and nearly 6,000 students. Its operating budget is \$85 million, in addition to a \$66.7-million research and infrastructure fund. Polytechnique is affiliated with Université de Montréal.

Polytechnique's campus now consists of three buildings: the main building, the Lassonde buildings, and the J.-A. Bombardier building, a research edifice shared with Université de Montréal (Photo 1).

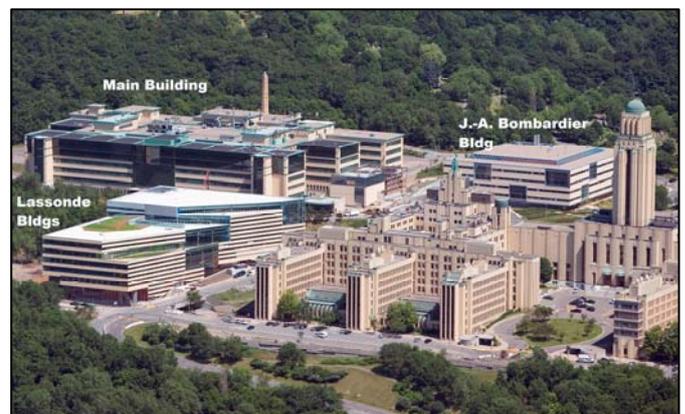


Photo 1 Polytechnique campus map

The Lassonde buildings are joined by an atrium; the library occupies the top two floors. Not only is it physically located in the midst of the population it is intended to serve, the library is also a pervasive presence due to its prominent position (Photo 2).



Photo 2 The library occupies the top two floors (blue)

This article details how each new role as expressed in the library's vision came into being. Its conclusion will list the main factors for success.

2 Fostering learning

In addition to its holdings, training programs and reference service — all of which share the common aim of fostering learning — the new library features more ergonomic furnishings, a fleet of computers equipped with the main desktop and engineering software used by students, and varied work environments.

There's no question that workspace needs have developed in recent years. It's not uncommon to see someone working on a laptop with a book to one side, and pen and paper on the other. Quite simply, the surface space of our former study carrels was insufficient.

After combing the market for ergonomic study carrels that were both “designerly” and green (and, let's face it, not overly expensive), we decided to design them ourselves. In fact, this is virtually the case with all of the library's new furniture, through a joint initiative involving ergonomists, designers, architects, the manufacturer, and us. Students also contributed to the process by testing various generations of prototypes. Our new carrels (Photo 3) now meet the three stated spatial needs: computer space, reading space and writing space.



Photo 3 Ergonomic study carrels

In line with the library building's green inclinations, these furnishings are also environmentally friendly. We prioritized the use of specific materials such as compressed straw panels and water-based glue. The proximity of various suppliers also minimized pollution engendered by emissions. And — surprise! — we even saved money: our self-designed, custom-made furniture ended up costing less than commercially available models.

Learning is also fostered by the availability of software, both desktop and specialized. For this reason, the library is now equipped with computers connected to the Internet and a printer (Photo 4). Access is free.

Lastly, learning is affected by the surrounding environment. It is misleading to state that all students need absolute silence in order to study. To best respond to differing needs, the new

library offers up an agreeable variety of work environments, diverse study areas that coexist harmoniously through the use of architectural elements. For instance, a passageway (Photo 5) separates the two distinct areas of the main floor.



Photo 4 Computers equipped with primary software

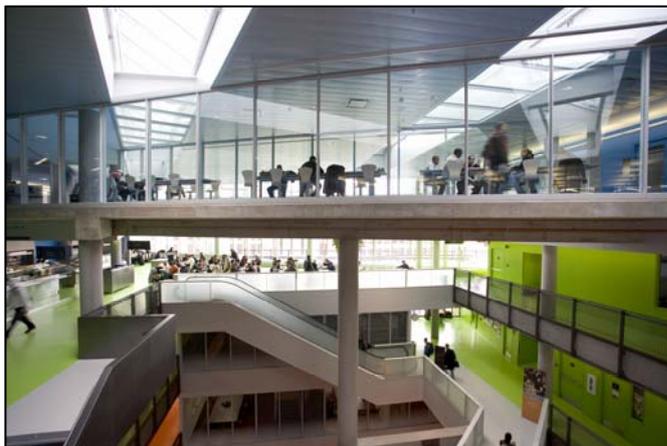


Photo 5 Passageway linking the two areas of the main floor

Figure 1 shows a plan of the main floor: the pale zone indicates “silent” work areas; while the darker-coloured area, where noise is better tolerated, is more activity-oriented. The same principle was applied to the top floor (Figure 2), where group workspaces and worktables were brought together in one wing (Photo 6).

By-the-numbers

- Surface: 3,967 m²
- 13 group work rooms (66 seats in total)
- 191 individual study carrels
- 173 group work spaces in the library
- 36 computers equipped with office software
- 27 “counter” places
- 56 armchairs
- 1 training laboratory (26-person capacity)
- 1 multifunctional room (30-person capacity)
- 300,000 books

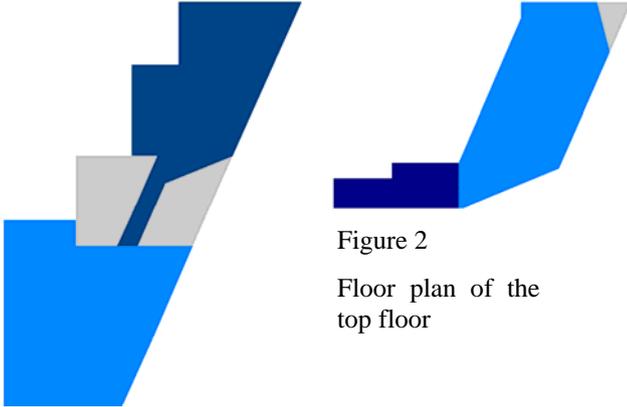


Figure 1

Floor plan of the main floor.
Grey indicates an atrium.



Figure 2

Floor plan of the
top floor



Photo 6 Group workspaces

3 Encouraging research

École Polytechnique de Montréal stands out for the sheer volume of its research. Naturally, this characteristic is reflected in the School's library operations [1]. Among other initiatives, one librarian works exclusively for the research chairs; the library maintains a directory of all the School's publications, and carries out a comparative analysis of the publications of 15 Canadian engineering institutions on an annual basis; graduate students develop their information-finding capacities through a compulsory research methodology course that requires them to create a portfolio on their research topic, work that is then graded by the librarians [2].

The only thing missing so far is a dedicated training space. This has now been rectified with the addition of a training laboratory equipped with student workstations (Photo 7). The lab is also fitted with the latest technologically mediated training tools. These allow professors to display their screens on the students' monitors, or use an electronic whiteboard and then save the content in .pdf format.



Photo 7 Training lab

4 Facilitating collaboration

Teamwork is a vital component of the School's pedagogical approach; the new library will be able to respond more fully to this need. Compared to the former facility, the number of group study rooms has more than tripled, going from four to 13. The rooms are also ready to use smartboards — a collaborative work tool that we feel will greatly benefit our students throughout their studies.

All the same, the number of available group study rooms remains inadequate in the face of current demands. This has led to the implementation of a second strategy: the creation of booths in the open areas (Photo 8). Much like restaurant booths, these "work booths" are equipped with a large-format flat-screen monitor, electrical outlets and network ports, making computer-assisted group work possible. That they also take up less space than a traditional workroom is an undeniable advantage.



Photo 8 Group work booths

A counter in the passageway (Photos 9 and 10) is also fitted for group work, as are the four-person tables on the upper floor.



Photo 9 Counter in the passageway



Photo 10 Another view of the counter in the passageway

A 30-seat multifunctional room completes the facilities designed to promote collaboration. The room's furniture can be moved as needed, while its three sets of glass doors allow it to open out completely onto an adjacent area. The room will eventually be fitted with sound and projection equipment. The great flexibility offered by this modular space augments its usage potential: seminars, institutional events, launches, noontime conferences, openings, themed exhibitions, workshops, and so on.

Lastly, collaboration is facilitated by the wireless network and the availability of laptop computers.

5 Stimulating the generation of new ideas

Since taking on the additional role of stimulating new ideas, the library has had to innovate in more ways than one.

To begin with, students will undergo greater exposure to culture. After all, the human mind cannot live on science and technology alone. To these ends, the library has acquired a collection of cultural works and has set aside an exhibition space for artworks.

Acquisition of the cultural collection was funded by the two student associations (undergraduate and graduate). The collection includes biographies, poetry, travel literature, and books on music, theatre, film, politics, sports, cooking, economics, and so on. The adjoining relaxation area makes this section particularly popular with the students (Photo 11).



Photo 11 Relaxation area next to the cultural collection

The exhibition area (Photo 12) on the top floor, in turn, is for displaying works by students and staff. A first exhibition gave one undergraduate student the opportunity to share his participation in a humanitarian aid project, the construction of a HIV screening centre in Malawi. The top floor also features an immense mural that underscores the accent on culture (Photo 13).

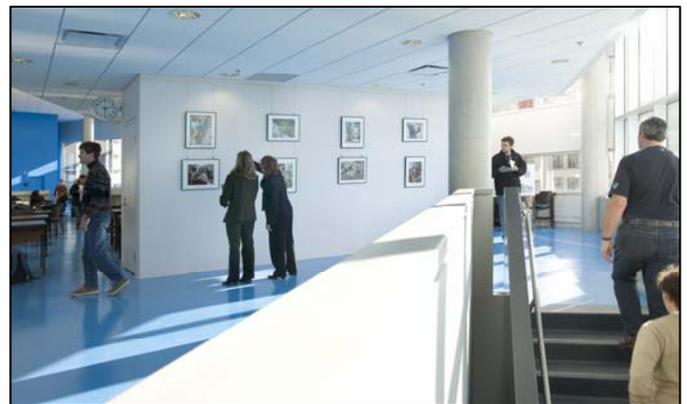


Photo 12 Exhibition area

The library's foray into culture is in line with the School's vision: namely, to produce engineers who are autonomous, good team players, aware of the need for continued professional development throughout their careers, and open to other professions and cultures. The cultural collection and the exhibition area both subscribe in particular to the notion of maintaining an open outlook.

Several future projects will complete the means currently deployed to stimulate new ideas. Among these are the planned brainstorming "islands" which will be scattered

throughout the library. These will consist of a number of seats grouped around a whiteboard, effectively creating spaces where students can spontaneously convene to solve problems, sketch out projects or simply hold discussions.



Photo 13 Mural on the top floor

A video wall is also part of our future plans. This project is intended as both a means of providing relaxation and of building awareness (Figure 3). The space will contain nine television screens that will simultaneously broadcast programs from specialty channels: continuous news coverage, documentaries, sports, music, and so on. Viewers can hear the central television close to the wall, or use headphones to tune into any of the other broadcasts. The nine screens can also be synced to broadcast from a single channel for special events.



Figure 3 Future video wall

Inspiration can strike at any moment. With this in mind, we plan to extend our opening hours. In other respects, the idea of limited access to the new library during certain periods

was a built-in concept right from the design stage. Here, too, specific architectural elements come into play to enable partitioning. At present, a simple metal-mesh curtain wall confines students to the active zone of the main floor (dark blue area on Figure 1).

6 And the staff?

One of the design challenges of the new library lay in the equitable division of natural light between library staff and users. After all, the former spend many hours there. Figure 4 shows the geographical distribution of the employee offices. All of them benefit from natural light, either through windows or the atrium.



Figure 4 Employee offices

7 Conclusion

It will soon be a full year since Polytechnique's new library first opened its doors. To date, some 350 colleagues from other Québec universities have paid the facility a visit. "Amazing," "impressive" and "luminous" are some of the adjectives often employed with regard to both the library and the Lassonde buildings' environmentally friendly aspects. As such, the project can be said to have lived up to expectations.

Its success can be attributed to a number of factors. Having a clear vision of our new library concept and its objectives was certainly a key component. This vision, which was supported by examples of other new libraries from around the world, was widely publicized within the community.

Time also played a key role. In our case, the vision preceded the School's decision to construct a new building by three years. It was then a matter of waiting for the announcement of a new expansion or construction project. Of course, one is always allowed to dream, even in a less-than-optimistic context. Witness the fact that our payroll had been cut by 30% when we began the strategic planning process that ultimately led to our intellectual forum.

Employee involvement in the design of the new library was a determining factor, to say the least. The managers and four employees met to oversee development of the operational and technical programs and planning for public and office space.

A blue library in “green” buildings...

Inaugurated in 2005, the Claudette MacKay-Lassonde and Pierre Lassonde buildings, named after two Polytechnique alumni, house the departments of computer and electrical engineering, the library and IT services.

The Lassonde buildings earned U.S. Green Building Council Gold Certification. Their energy performance is 60% better than the standard set by the Model National Energy Code of Canada for Building. Scoring 46 on the LEED (Leadership in Energy and Environmental Design) points scale — the highest score in Canada — the Lassonde buildings have set the standard nationwide for sustainable construction practices. École Polytechnique de Montréal is the first university institution in Canada to obtain the prestigious international certification.

The LEED certification process has many components, including sustainable site management, water savings, energy efficiency and atmospheric preservation, the use and re-use of materials and resources, indoor environment quality, and innovation.

Among the distinctive characteristics of the Lassonde buildings are the following:

- The recycling of heat from the chimneys of adjacent facilities to generate two-thirds of the heating for the new buildings;
- A “green roof” that limits heat concentration: more than 600 of the rooftop’s 800 m² surface is covered with clover, while the rest, covered in white stone, acts as an insulation barrier against external heat;
- Interior sensors that automatically shut off lights and air conditioning in peripheral areas;
- The use of HFC-134a in mechanical systems to minimize damage to the ozone;
- The use of paint, coverings, furnishings and doors that emit little or no volatile organic compounds or urea formaldehyde;
- The collection of rainwater and drainage water for re-use in the sanitation system, along with a number of double-flush toilets and sinks and urinals equipped with infrared sensors — all of which works to control water use, resulting in a 92% reduction in the consumption of drinking water;
- Parking designed in line with environmental standards: two-thirds of parking spaces are reserved for car-poolers, and six spaces are equipped with plugs to recharge hybrid vehicles;
- The recovery of 82% of construction waste;
- Approximately 50% of the materials used were quarried, extracted or manufactured at a distance of less than 500 km, thus reducing emissions produced by transport.

This approach had many advantages. To begin with, a shared reading of certain key works [3, 4] allowed us to rapidly increase our knowledge of the field and fall into step in our thinking. Each library sector and employee category was represented. Besides enhancing our reflective process, this approach helped us accurately define our needs, which in turn informed our discussions with the architects and engineers.

This involvement gave employees an unprecedented opportunity to shape their working environment and familiarize themselves with the ins and outs of such a far-reaching and complex project.

The final factor for success was community involvement. We held numerous consultations with both authorities and ad hoc groups to promote our vision, explain our concept, validate our plans or obtain advice regarding a specific problem.

Several steps remain to be completed before our concept is fully realized. These final phases call for sums which exceed the school’s ability to pay or entail an inappropriate burden on regular budgets. We are currently in the process of seeking a major donation.

Nonetheless, all the essential elements are in place. We sought to create a breeding ground for new ideas, a dynamic and stimulating intellectual environment, a forum for discussion and information exchange, and an agreeable atmosphere... And that’s just what we’ve got! (Photo 14)!



Photo 14 The front part of the library and its view of Montréal

“Rien n’est plus dangereux qu’une idée, quand on n’a qu’une idée.” [Nothing is more dangerous than an idea when it is the only one you have.]

Émile-Auguste Chartier, 1868-1951

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Ergonomist: René J. Comtois

Designer: François Dumas

Furniture manufacturer: AudioDesign inc.

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