



lessons learned

white paper on educational design and how
traditional thought is quickly evolving

2016

mcCallumSather



It started with St. Jean de Brebeuf Catholic Secondary School. Joanne McCallum and Greg Sather, new co-founders of mcCallumSather the architectural firm, completed an addition and renovation that successfully integrated sustainability and energy efficient design concepts.

It quickly became a prototype for neighbouring school boards who were inspired by this progressive approach.

“We are all parents, aunts, uncles. We all want to make sure we provide our children with the benefits of appropriate environmental solutions,” says Joanne McCallum, Director of mcCallumSather.

“We know definitively that sustainable design positively impacts children’s ability to learn and improve academic performance. We realized this was a unique opportunity to teach students, through their built environment, the value of environmentalism. Who better to convey the message through both instruction and building design, than our educational institutions?”

evolving spaces based on evidence based design

The traditional pedagogical thought dictated a curriculum focused on individual learning, taught by a solitary teacher at the front of the room, with an emphasis on individual learning and memorization. In fact, as recently as the 80’s, school’s in Ontario routinely boarded over windows in order to save energy costs and keep student’s attention trained on the board.

Yet, in the last two decades teaching styles have quickly evolved, pushed forward by new research that questioned old assumptions about learning.

As a result, school design needed to adapt in order to support new teaching styles, whether through renovation within the defined constraints of current facilities, or in the imaginative reinvention in new construction.

Now, gone are classrooms with desks lined in neat rows, reminiscent of industrial assembly lines of the 19th century, where students were encouraged to remain static and quiet. The quality of ventilation, views and lighting have quickly taken on a new importance based on research from the late 90’s.

“Evidence based design clearly indicates children’s access to natural light and ventilation score better on test results. It’s simple,” says McCallum.

Our priority as designers is to create healthy environments, which pay careful attention to:

- the quality of light
- support for the body’s natural ability to recognize the time of day
- spaces which allow generous sight lines and views to the outdoors/nature
- design that naturally reduces eye strain

This increases the demand for a highly integrated approach, one that carefully incorporates mechanical, structural and electrical components to create a high-functioning building. Instead of boarding up windows, we now focus on the quality of the building envelope, mechanical systems and creating natural ventilation.

Another shift began to occur with an increasing appreciation for and accommodation of the idea that **Everyone Learns Differently.**

Curriculum continues to evolve allowing for these differences, as teachers seek to support and encourage learning in all of its forms. Here flexibility is paramount.

Schools have also adopted unique identities, catering to different strengths, values, methods and teaching styles, ideally providing parents with options to tailor their children’s education to their individual strengths.

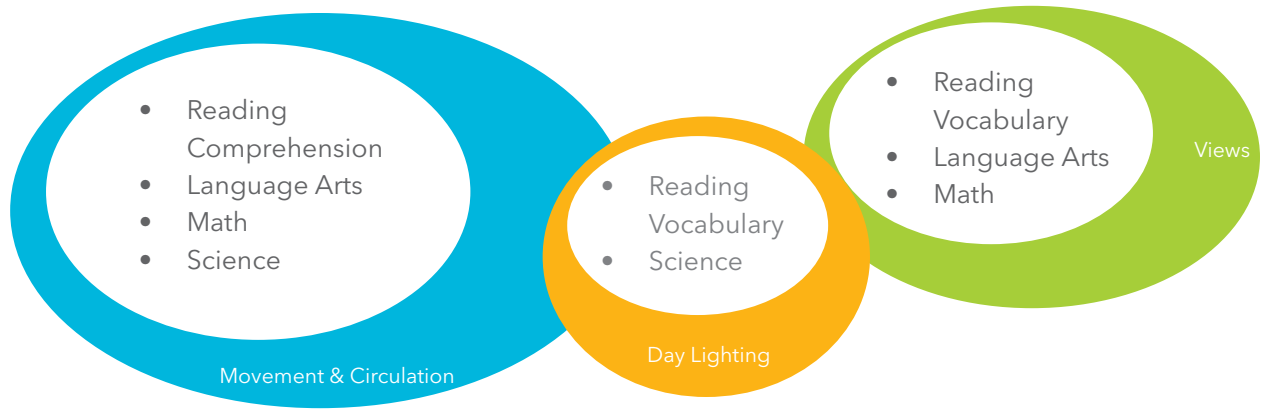
“At Appleby College, where we developed a 50 year master plan for its campus, its curriculum and teaching style supported and encouraged the integration of technology. Its goal was to ensure every student had a tablet.”

“By contrast, Newton’s Grove, where we are currently assisting in the development of its campus, prefers text books and face-to-face interaction with its students. While computer rooms and technology have a place, they are not encouraged in every classroom,” describes Drew Hauser, Director at mcCallumSather.

“You’ll find there is no one right answer in designing an educational environment.”



WHERE DESIGN SIGNIFICANTLY INFLUENCES STUDENTS SCORES



Effects of School Design on Student Outcomes, C. Kenneth Tanner, December 2008

This has led to greater tailoring of our design. As Joanne McCallum explains, the first, critical step in the process is to work with a principal to learn how each institution and its instructors teach.

For instance, when we renovated two science rooms including prep rooms for the District School Board of Niagara, we brought forward eight to 10 options based on best practices and our own research, working through these alternatives and testing our design ideas in close collaboration with instructors to see which model would work best for its specific style and evolving needs. As a renovation, we then carefully weighed these alternatives to best work within the space constraints of its defined space.

“We thought outside the box from the get go. We then challenged pre-conceived notions of educational spaces, things such as the linearity of lab benches, the traditional organization of space and the static nature of classroom design,” McCallum describes.

“There are issues we need to deal with in each unique case, in order to create options and help a Principal examine and reinterpret space within the overreaching parameters established by the school board or governing authority. ”

forward thinking

Much like when we began incorporating sustainable practices in St. Jean de Brebeuf 20 years ago, McCallum Sather continues to push the boundaries of educational design.

We foresee three transformative design approaches that we believe will continue to inform educational environments in the next 10 to 20 years.

1. creating learning focused environments

We see a greater demand for spaces that go beyond the traditional classroom, but larger common environments designed for learning, whether that be instruction based, collaborative or individual.

Perhaps the strongest representation of this form of innovative learning environment can be found in our recently completed Phase 1 renovation and addition at Hamilton District Christian High. Here, we incorporated a Learning Grove downstairs and Learning Atrium upstairs.

“Students and teachers just want to be there. It is small by comparison to other spaces, however, it is always filled with people,” describes Drew Hauser.

The space is filled with light, skylights and natural materials, including a fig tree growing within the entrance, creating a visual connection between the outside and indoors. We paid special attention to the acoustics of the space, allowing for natural groups to form and collaborate, while respecting areas for individual study.

Working in close consultation with the school’s leadership, we tied our design concepts of the metaphors of Campfires, Cafes and Caves based on Prakash Nair’s work in designing schools, a philosophy which connected with the school’s deep sense of mission and vision.

For the school, one of its first priorities was to create an environment that responds to and supports the connection



“The students really take pride in their new space and the teachers are genuinely happy.”

Bert Poort, Facility Renewal Administrator with the District School Board of Niagara describing the reaction to our design of the two new science rooms and prep areas.

between being an individual with specific needs, and balance that with maintaining that students are valued members of the larger school community.

“There is an authenticity in the space,” says Hauser. “You can visually scan the space and immediately see where you can meet, without having to arrange a meeting. Teachers can easily breakout with a smaller group of students and work through ideas. Students can tuck into caves for individual study, while groups begin to form around natural collaborative areas.”

“There is something transformative about these spaces,” expands Joanne McCallum. “It accommodates the way we learn now. In the case of the Hamilton District Christian High, you have a huge, great table in this space and you can see students and teachers gather around. Its design encourages interaction, and as a direct result you can see the barriers between students come down. You can see them interacting in a different way, just because the space has been provided.”

2. parkour inspired design

We incorporated a Parkour space within the Appleby Campus Master Plan and it inspired us.

The definition of this exercise form is:

“Seeing one’s environment in a new way and imaging its possibilities. It is all about movement, running, swinging, jumping and rolling, or whatever form of movement deemed suitable.”

Mirroring our movement away from static, formulaic approaches to learning, we see great potential as schools move away from static, formulaic spaces. This movement towards more flexible environments has implications for all areas of a school design. It’s all about imagining the possibilities.

Research continues to connect physical activity with behavioral and academic outcomes.* In response, we see school’s creating spaces that go well beyond our ideas of a traditional gymnasium. Newton’s Grove is incorporating a Smash Tennis Academy. Appleby College included a Parkour course design within its Master Plan.

◀ Hamilton Public Library, Downtown Location, Maker Space.

In the classroom, we are starting to see new furniture styles and classroom organizational theory that encourages movement. Labs no longer have two students sitting at a static lab desk, but flexible lab benches that easily accommodate movement and ever changing groupings of students.

Additionally, where once we saw school boards neglect outdoor spaces, boards such as the Toronto School Board have set out guidelines that discourage traditional asphalt and turf approach in lieu of a variety of textures and sensory experiences.

We foresee a movement towards outdoor classrooms and greater connection between a school’s indoor and outdoor environments, with an increased emphasis on sustainability and environmental site management.

3. hands on learning

Perhaps inspired by the design of the modern office, Maker Spaces are springing up in a variety of educational environments, no longer confined to the technical schools or arts colleges.

As the name implies, this is a space where students can create tangible projects, whether online, with 3D printers, traditional arts and crafts or through the use of other tools or techniques. Maker Spaces can be designed to focus on one area of scientific study, or become more broad and inclusive of various creative disciplines.

It is a further realization of the movement away from teaching in only one way, where students are tied to a page in a book to learn how things work. Maker Spaces allow students to work with their hands, build, create, develop and experiment in a safe environments. A Maker Space, when done well, ultimately encourages individual thought. What students create is only defined by the limits of their imagination.

We are currently integrating Maker Spaces into McMaster University, University of Guelph, Newton’s Grove Private School Campus and Hamilton Public Library.

* Centre for Disease Control & Prevention: The Association Between School-Based Physical Activity, Including Physical Education and Academic Performance, 2010

case study

Examples such as Phase 1 of Hamilton District Christian High renovations illustrate many of the best practices we have seen developing in the design of exceptional educational spaces.

The school's administration was looking for a designer willing to listen and work with them on the development of an innovative new environment. Management and administrators were committed to change, one built on the idea of Campfires, Caves and Cafes pioneered by Prakash Nair's work on school design. Working together as a collaborative and effective team, we brought about a vision that we both believed in.

"It's not about what to change, it's about how to change," Siebenga explains. The administration's goal with this renovation and reinvention of the school is to create a "place of inspiration". But it was a significant departure from traditional thought.

"We recognized this was a major shift and so Phase 1 is a test of our ideas in a smaller space, to make sure this style would work for the school before we took those ideas to a larger platform. Phase 2 currently in design development, because what we found is that this model works very well for their school."

The team at HDCH point to three factors they believe were central to supportive educational environments:

- 1) A space that has an adult feel and demands respect. The design at HDCH does not underestimate its students. Instead it is a space where students feel valued.
- 2) It is collaborative, with multiple opportunities to gather in large or small groups. The hubs play an important role, creating the feeling of privacy without being isolated.
- 3) Flexibility is paramount. Just as our spaces must be flexible, the architectural elements and the building systems must be able to change, easily, so that we can continue to evolve.

"Leadership has to push the envelope," says Siebenga. "As we push our learning and teaching concepts forward, we have to ensure the architecture of the space evolves to match and support this work."



