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The Mawson Centre, University of South Australia, Australia
Guida Moseley Brown Pty Ltd/Russell and Yelland Pty Ltd Architects in Association
2005 DesignShare Merit Award

"Designing School 2.0: A Study of Philadelphia's Science Leadership Academy"

"The school was to be an inquiry-driven, project-based school where students would be assessed by the work of their own creation.

What was frightening to me was, even with that idea in hand and a lot of experience with progressive curricular design, I had little idea how to make that idea come to life in the physical spaces of the building." - Chris Lehmann

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"Designing School 2.0: A Study of Philadelphia's Science Leadership Academy"

by Chris Lehmann, founding Principal of Science Leadership Academy (opened fall, 2006)

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Note:

> Like many in the school design community, we had heard about a push to create the school of the future in Philadelphia over the last few years after Paul Vallas arrived in the district with a mandate to spark enormous systemic change across the entire public school community. This past year, 4 new public high schools were given the opportunity to test new learning boundaries — *including the one of last year's "Recognized Value" DesignShare Award winners going by the eye-catching name of the "School of the Future"* (through a strategic partnership between Philadelphia and Microsoft).

> While this school certainly claimed a great many headlines and sparked a fair degree of debate as to the how 'scalable' the school could be given its budget-to-student ratio, we were also intrigued by another high school that opened up at the same time just down the street.

> **The Science Leadership Academy**, in partnership with the Franklin Institute, not only was preparing to open up in a very innovative office building renovation in City Center at a fraction of its peer's budget, but it was being described as one of the only examples of

"School 2.0″ in the United States (and beyond). While we'd heard much talk about 21st century schools and even schools of the future, we were very curious about a school that was echoing transformations in the field of communication technology and the Internet itself. Certainly a case study of this "School 2.0″ design grabbed our attention. And even better, we were curious about the design implications as the school's founder and architects tried to make the renovated space come to life to support a truly new way of embedding technology into the lives of their students/teachers.

Chris Lehmann, the school's founding principal, was kind enough to pen a piece for DesignShare that spoke to the pedagogical and design choices that underlie the creation of Philadelphia's first (if not the US') version of "School 2.0″. We think you — like so many who have already traveled from across the country and from abroad to visit the school in person in its opening year — will wonder why more architectural 'schools of the future' aren't following a similar design/curriculum/community path! By the way, keep an eye out for an upcoming issue of Edutopia. We've heard rumor that they've done a wonderful article on the school as well and can't wait to read it soon!

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Sooner or later, every teacher and administrator fantasizes about starting a school of their own. Few, however, move from off-the-cuff theory to the practical steps required to open the school house doors to real students and teachers.

Fewer still manage to start an urban high school of their own while only in their mid-30's, a school that manages to gain national/international attention within its first semester of operation, a school that has already received over 2,000 applications for only 120 9th grade spots available for the 2007-2008 school year. Chris Lehmann is just such a school founder.

The story of his newly opened school, the Science Leadership Academy, has already been hailed as one of the first legitimate examples of "School 2.0″ design in the world. Even better, it appears not to have cost an arm-and-a-leg to design a true 21st century school while taking full advantage of a renovated office building within a very lively urban context.

DesignShare had the opportunity to present alongside Chris Lehmann this winter and wanted to ask him to share with our community the design and lessons-learned from opening this remarkable school in Philadelphia, Pennsylvania. Chris wrote the following case study in an effort to share what he learned about school design along the way.

* * * * *

Looking Through the Swimming Pool for Something Different Entirely

It was 4:30 in the afternoon after classes officially let out for the day a few weeks back. I was standing in an open area near the stairs on the second floor of the school, leaning forward, arms resting on the ledge that overlooks a giant cut-out hole just outside my office.

This unique 'design' feature of our school allows us to look directly down into our café and public entrance located on the first floor. The interior walls of this cut-out structure had been painted light blue. As a result, the kids have nicknamed the space "the swimming pool" since we first opened up this past fall.

A few students were hanging out with me that afternoon as we carried on a conversation with some of the kids in the café below. School had been out for an hour and a half already, but the building still resonated with energy and noise.

As the conversational volley mellowed for a minute, Naima, one of the students standing next to me, looked my way and said, "This school really is different, isn't it?"

"Yep, it really is." I replied, and we both smiled as we looked down through the blue "swimming pool" cut-out into the café below and heard the conversation build once again.

The Transformational Power of Innovative School Design

As the founder and principal of newly opened Science Leadership Academy (SLA) in Philadelphia, Pennsylvania, I found myself often thinking about the impact of the architectural decisions made as we prepared to open up for our first day of school a few months ago. A couple of core questions stayed with me from the very beginning:

- What happens when a design idea becomes an educational idea?
- What happens when architects care as much about pedagogy than bricks-and-mortar?
- What happens when a community realizes that creating a new school building won't matter much if it is ultimately founded on the same educational ideas of the iconic school houses of our past?

Recently, I spent a day presenting to the Gladstone, Oregon community about the design of what we call "School 2.0," the founding of our new school in Philadelphia, and what I've learned about merging new ideas about education into the architectural process itself. The Gladstone community passed a bond for $40 million dollars to renovate their old high school. John Weekes and his architectural team at Dull Olson Weekes Architects suggested that before they were ready to start sketching plans, the town needed to think about the future of learning beyond what was commonly known. This is why several of us were invited out to Oregon to speak with the community.

It was one of the more powerful days of my educational career, watching an entire town come together around the idea of transforming education in unexpected ways rather than just rushing to design a 'new' high school. They were willing to work together to transform the very idea of school with the design of the building serving a specific pedagogy. I was truly inspired and felt once again much of what I experience as a founder and principal of a new school myself. That core idea – that the design of the building could serve a particular pedagogy – was central to the work we did before the opening of the Science Leadership Academy.

SLA was to be a new high school, formed in partnership between the School District of Philadelphia and The Franklin Institute, one of the oldest science and technology museums in the world. The school was to be an inquiry-driven, project-based school where students would be assessed by the work of their own creation. What was frightening to me was, even with that idea in hand and a lot of experience with progressive curricular design, I had little idea how to make that idea come to life in the physical spaces of the building.

Designing School 2.0

At the heart of Science Leadership Academy was what is the idea that is now becoming known as "School 2.0."

For many, this concept grew out of the world of technology where the concept of "Web 2.0" has gained a great deal of attention lately. Where the 'first version' ("Web 1.0") of the Internet still required most people to simply 'receive' information, social networking tools such as blogging have changed the very nature of finding, using, and creating information. These Internet-based tools are based upon the idea that everyone is an active/equal participant, and that information constantly flows in all directions rather than just from experts to passive audiences. Essentially, what this phrase means for education is the idea that technology allows students/teachers to create content as much as receive content. Furthermore, students/teachers are able to become vibrant members of global social networks where learning and collaboration occurs 24/7.

Even the U.S. Department of Education has recently been discussing the evolution of "School 2.0" in an effort to invite educators to re-imagine what is possible. Anyone that has spent time participating in the edu-blogosphere (blogs focused on education) as of late has certainly heard much about these ideas. And yes, we do embrace the front-edge of technology in our school everywhere you turn. This includes a complete "1:to:1" Apple iBooks laptop program for all students/teachers along with an open-source inspired web portal that uses Moodle, Drupal and Elgg. Not only do we expect our kids/teachers to 'use' technology, but we expect them to build and co-write the very software that our school uses. Education and technology in the 21st century can not afford to be a 'passive' business as it was, perhaps, in the past.

On the other hand, I believe that "School 2.0" goes well beyond the literal machines and software often associated with technology.

It is built around the notion that we must question the future of learning, and therefore the future of schools. It is built upon the dream of educational reformer John Dewey who argued more than a century ago that meaning is constructed as a community, that student learning should be judged by the work of the students' creation. And now, with the tools of the 21st century - blogs, podcasts, wikis, etc that rapidly increase students' ability to research, communicate and create - we can create schools that live up to Dewey's challenge. We can create schools where what we do with the information we can access is

more important than the information we can memorize.

"School 2.0" is further built upon the idea that words like analysis, synthesis, creation, communication, reflection and wisdom have taken on added importance in our society in this day and age. These words, therefore, must become paramount in our schools as well. Nothing like shooting for lofty goals, I always say.

Making Brick-and-Mortar Decisions

In the very early days of my planning year as a soon-to-be-principal, I was told, "Take a look at the plans for the school when you get a moment. You've got a meeting with the architects, the builder and the School District folks in three days. They're going to ask you for your input."

Panic and fear seemed to be the predominant feelings that swept through me. These were, after all, decisions that would be permanent. These were brick-and-mortar decisions that I would be making for the students and teachers who would inhabit SLA for years to come. And I could not get it wrong.

Uniquely, the building space we were given as a new urban high school presented a great many challenges from day one. The space is a converted office building in the heart of Philadelphia's Center City. Worse, the building is actually three buildings merged into one. To make matters even more complicated, I was walking into this process late with a pre-existing building plan already being fine tuned that a lot of good people had spent a lot of time on already.

Fortunately, many of the early decisions the team had made were fantastic and we had a great base to begin with. This left us with the following questions:

- So what were the things we wanted to change?
- What could we realistically expect to change?
- What were the things that truly would make a difference to the way we looked at teaching and learning at SLA?

Here are the key areas we focused on:

Re-Imagining the Administrative Suite

First, we needed to make both a symbolic and a meaningful change by redesigning the Main Office space. The original design was a classic school main office complete with a huge Principal's Office in the back of the main office guarded by a phalanx of secretaries. (It did have nice windows, I must admit.) Because our school's core principles stress the collaborative and transparent nature embedded in "School 2.0" thinking, we moved the Principal's Office to the front of the office suite with a door leading straight into the main hall. Better yet, we wanted no "gate-keeper" guarding access to my office.

From day one, the students and teachers would see my office as their office. Within the overall administrative suite, we made the offices smaller and created space for teachers and administrators and support staff to gather together. The office essentially was designed as community work-space and a dynamic teacher's lounge all in one. We designed the area to be the true hub of activity for the school, with conference rooms for private work and open spaces for collaboration. Its design became a symbol of the pedagogy we wanted to infuse throughout the building.

Re-Imagining the Cafeteria

The second challenge could be found on our first floor because we only owned a small piece of the overall footprint.

We share the floor with a business, and so our first floor could only house our cafeteria and a fitness room. Originally, the cafeteria was going to small and recessed to allow for a more traditional school entry way. Given that our first floor has amazing windows along much of the exterior of the building, however, we wanted to enlarge the cafeteria so that it was the first thing you saw when you walked into the building.

Likewise, we wanted the students to have a really wonderful, well-lit place to eat and hang out and for anyone walking down the sidewalk to see the lives of our students unfolding in real-time. And with that change came a change of name as well. We started calling it the café to attempt to signify the change in mindset the space represented. Every space - including what could have 'just' been a cafeteria - would be

re-imagined as dynamic, collaborative, and public spaces that echoed what SLA and "School 2.0" stand for.

Re-Imagining Presentation Spaces

Our third challenge included creating a wing on the third floor for performance and creation. Our performance studio, our digital production laboratory and our artists' studio are all gathered together in a part of the building we nicknamed Times Square throughout the design/planning phase.

One of our core values in the school is presentation, and we wanted to create a wing of the school where many different facets of presentation – dramatic, digital and graphic - could all be made manifest. Our goal was by highlighting the different ways students could create, we would help every student find the power of their own presentation.
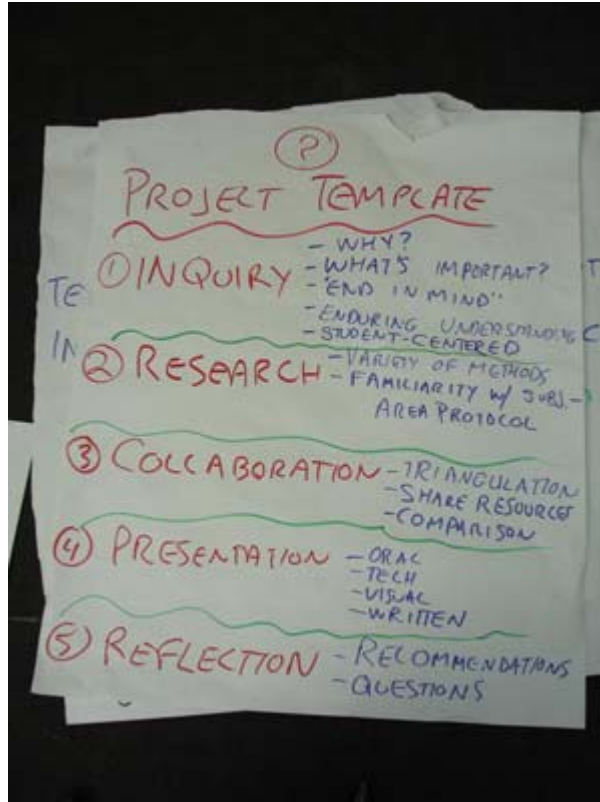
Re-Imaging Classroom and Lab Spaces

Our fourth challenge lay at the heart of the SLA experience: the classroom and lab.

Every classroom was planned to be large enough to accommodate project-based learning and flexible seating. The smallest classroom in the building is over 800 square feet, which for a former New York City educator feels gargantuan. We wanted students and teachers to be able to move and create.

And then there were the science labs, and here our architects did a brilliant job of creating 2000 square foot spaces where students could really have space to learn. We wanted to create spaces that could be both lab and classroom. We wanted students to see science as alive. We wanted teachers to be able to move seamlessly from explanation and instruction to laboratory. We didn't want "lab" to be something students experienced as separate from every day science class.

So we created space where students could have plenty of lab work but where teachers could still bring students together for a more traditional classroom experience when needed. Even the prep rooms were designed to be larger than usual because we wanted students who were pursuing independent projects to be able to use those prep rooms as lab spaces where experiments could be stored, rather than have the out in classrooms where as many as 150 students might come through a day.

We didn't win every design/re-design battle. This is vital to keep in mind for anyone working doggedly to connect future-leaning pedagogy and school design.

There were some challenges that the building presented that were too costly to overcome. So sadly, despite my deep-rooted belief in physical education, SLA has a small fitness room, but no gymnasium for the kids. Our performance studio has a regular classroom ceiling, rather than the high ceiling that would have let us install stage lighting. And our dream of an outdoor science center off of the third-floor roof, complete with greenhouse, weather station and astronomy center will have to wait until we can find a way to reinforce the roof to be strong enough for class access.

Hopefully in the years to come, SLA will find ways of incorporating some of these early design and program ideas into our future spaces.

Where Are We Now

We've already lived one academic semester in the school building so far. We've found some amazing ways in which our ideas have powerfully impacted the building, some really happy accidents, and some things we probably should have noticed the first time.

Our plans for the main office really did work quite well. The office has indeed become the hub of the school. It's where you can find teachers and students and administrators working together or just sharing a cup of coffee. The common space goes a long way in creating the collaborative team feeling we wanted. And we definitely have created a different kind of Principal's Office. Suffice it to say, that sense of openness has worked. It's rare that you don't find a crowd in my office during lunch or after school. And I couldn't ask for anything better.

It might in fact be one of the elements I'm most proud of as the founding principal who knew that we needed to challenge the traditional relationship between administrators, teachers, and students if we were going to really pull off "School 2.0" along the way.

Our production spaces do have that sense of creativity, too. The wing of the building, while not technically called "Times Square" anymore, does always have a feeling of creativity and exploration going on. Even better, this energy translates to the other classrooms and learning spaces as well. Our plans for the science classrooms and the general classrooms have borne amazing fruit so far. And our café does feel different than almost any other school eating space you're going to find.

And I have to admit that there was one part of the design that I had to be convinced to keep that I am thrilled about now.

The architects designed wide hallway "streetscapes." I wondered at the time if those spaces would be better served in making even larger classrooms. Fortunately, the design team helped us see the value of having larger public spaces where 'learning' can break-out into in ways that our students and teachers co-create together on a daily basis. Our classes are certainly big enough for what we're trying to do, and the long, wide hallways contribute to the sense of openness that defines the school's culture/attitude. I love how much space my kids have in the halls whenever I walk around the school. As you can tell, I am thankful that I was talked out of changing the "streetscapes" concept in those early days.

The Happy Accidents

The happy accidents? There are two, and both deal with stairs that almost were built. Yes, *almost* built.

There was going to be a master-stairwell right at the entrance to the building that would have taken one from the first floor straight to the Main Office. It certainly would have given visitors a sense of a grand entrance as they climbed it and for many urban schools in a similar situation this would have been an appropriate decision. In the end, however, it ended up being an engineering nightmare to pull off. Ironically, this was only discovered after a gigantic hole was cut in the existing second floor floor to allow access to the new stairway.

The solution? The builders built a low wall around it, painted the interior light blue, and our "Swimming Pool" was born. It's ended up making our café feel even more airy and special as light from above poured in. Even better, it really ties that first floor space into the rest of the building and allows connections to remain strong at all points in the day.

The other accidental space that was created - also because of a stairwell that wasn't built - occurred in the middle of the building between the second and third floors. The space that was going to be a stairwell ended up creating two alcoves, one on each floor. These spaces can now be used as student-owned space. On the third floor, the space sits outside of the performance space in our creative suite section of the building. It becomes a natural student exhibition space. On the second floor, it resides outside the library and across from the Main Office. This makes for a perfect place for a student lounge area and for allowing less formal conversations between students and adults throughout the day. We believe each of these 'accidental' alcoves will become vibrant hubs of interaction in the years to come as our school grows and truly takes shape.

An Honest Look at What Didn't Work

So what didn't work?

Well, in retrospect, there's one glaring mistake that none of us thought through. I offer it up for anyone planning a school: do not put the performance studio over the library. I find myself smiling and shaking my head a bit as I type that.

Our library really isn't the classic "no-noise" library. It's meant to be more of an extension of the collaborative spaces our classrooms and labs are, a place for conversations and research to intermingle. At the same time, however, when twenty-five kids all start doing dance, movement, and exercises at once on

the floor above, it's not easy to get much done in the library spaces below.

Furthermore, as much as I love the design of our café, we didn't think that our open space meant that keeping the kids on the first floor for the entire period would be a challenge. Essentially put, we can't do what gets called a "captive lunch," i.e. — we can't keep kids in the cafe during lunch. Because the space is so open that, with only one
security guard, we can't keep kids away from the back stairwell. Now, pedagogically, there's something nice about letting kids feel like they aren't warehoused during lunch, but practically, it can be a logistical nightmare that does put added pressure on staff to monitor students. (Because, sadly, high school kids don't always do great
things with free time.) It's a trade-off that I'd still make today, but I wish I could say that it was a conscious choice we made.

Looking Back / Looking Forward

There are days when I cannot believe we are more than halfway through our first year as a new school community.

Part of me cannot wait for year two to start. Part of me wants to hang onto every day of this first year. Likewise, part of me is completely petrified about how much more work has to be done between now and September 2007.

Amazingly, we've already had 2,000 students apply for the 120
9th grade spots available and we interviewed over 600 students for those spots already. 2,000 applicants for a 2nd year school with only 120 openings just amazes me! Likewise, we're about to advertise for our next four teaching positions and the feedback from educators across the country has been amazing. Clearly the story of this new, innovative urban high school has begun to get out.

This year, unlike last, I also get to go through those resumes and interviews with the teachers and students who have helped to found the school this first year. While I suppose we occasionally take for granted the normalcy of students and teachers working together in all aspects of SLA's life, being able to form incoming student classes and discuss teacher applicants with our kids is an amazing gift we all share.

And I can't wait to open up
additional spaces and floors in our building as well as we expand one grade a year until we'll be full at the beginning of the 2009-2010 school year. We're ordering the next six classrooms worth of furniture as we speak. We'll use more classrooms as we expand to fill two whole floors completely. Likewise, we'll start to figure out what all the little office / practice room nooks can be used for. And with each part of the expansion of our school, we'll move that much closer to seeing how all the theories we had about how space would get used will play out in practice.

I'm looking forward to some more "happy accidents" along the way.

The Big Picture

The last year and a half has been an education in school design, and certainly, I've learned a few dozen lessons along the way. Most importantly, we've proven that converted office spaces can be unique, beautiful and can serve a specific pedagogy. And we've proven that the school of the future doesn't require an astronomical budget as long as its based on taking advantage of every creative resource at your disposal and fundamentally changing what we mean by 'school' in the process.

And I think we came up with some questions that will help guide us in the years to come. Perhaps, some of them will be of use to other school founders and communities looking to design learning spaces that will truly serve their educational goals for the future. For us, we had a chance to see if "School 2.0" could take place in real time. Each community, however, needs to find what it uniquely means by a "21st century school" long before it looks to design it.

Some of these questions retrofit to the answers we came discovered along he way. At the hear of them, however, is a feeling that all school designers should ask these questions before drawing up a single sketch – especially as we design schools that can move toward that notion of "School 2.0."

- What is the educational mission of your school?
- How can the spaces in the building contribute to that mission?
- How flexible and adaptable are your spaces?
- How do your spaces support student-centered learning?
- How will all the members of your community use 21st Century technology tools, and how does your building support their use?
- How can you create spaces that will allow all members of your community to collaborate?
- How can you create spaces that allow all members of your community to feel ownership?
- How can you build spaces that others may interpret differently than you and find new uses for?

Final Thoughts about the Design of "School 2.0"

In the end, what was most amazing about the design of SLA was that educators, architects and builders came together around the idea of what a school of the future truly could be. And even with some rather daunting challenges, we built an amazing school in the process.

And as I said earlier, "School 2.0" goes beyond technology. Likewise, a school that truly is designed for the future may also go beyond the literal building itself, or at least not require a massive investment in state-of-the-art campus design. Sometimes, as I've learned, it shows up in small choices that allow kids and teachers to connect, collaborate, and create.

Our building may never look like much more than a converted office space from the street itself, and there's not much about the space that will win innovative design awards from a "cutting-edge" design standpoint. Instead, it's a smart, beautiful, not horribly expensive to build space that allows all involved to learn together as we move forward into the 21st Century. This is what we mean by "School 2.0."

Although, I still wish we had a gym

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Bio:

Chris Lehmann — Chris is the founding principal of the
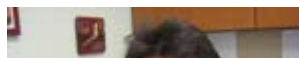
[Science Leadership Academy](#), a progressive science and
technology high school in Philadelphia, PA. Chris has returned to his native Philadelphia
after nine years as the Technology Coordinator at the [Beacon School](#) in New York City, one
of the leading urban public schools for technology integration in the nation.

In 2006, the [National School Board Association named Chris one of "20 to Watch" among
American administrators](#). In 2001, Chris was honored by [MOUSE](#) as a Champion of
Technology and Education for his work on building the portal at the Beacon School.

Chris has spoken at educational technology conferences all over the world, including the
[International Conference on Technology and Education](#) in 1998 in Edinburgh, Scotland and
at [LinuxWorld](#) 2000 in San Jose, California.

Chris received his B.A. in English Literature from the University of Pennsylvania and his
M.A. in English Education from Teachers College, Columbia University. Chris is the author
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