

NEXTschool

LEARNING - DECOMPARTMENTALIZED

**Phase 1 ~ Summary Report
Research & Development
November 1st, 2017.**



a  **learn** initiative

CONTENTS

INTRODUCTION

- **Executive Summary** 3
- **Objectives** 4
- **Why *NEXTschool*?** 5
- **Context** 7
- **Assumptions** 13

KEY FINDINGS

- **A Global Perspective** 15
- **Emerging Pedagogies...** 16
- **Setting** 18
- ***NEXTschool* Levers** 19
- **Nuts and Bolts...** 19
- **Convergence and Divergence...** 20

CONCLUSIONS

- **Toward a Systems-thinking Solution** 22
- **Systems Drivers** 23
- **A ‘Day-in-the-Life’...** 25
- **Summary Conclusions** 28

RECOMMENDATIONS 29

- **Epilogue...** 29

Appendix ‘A’ – Chronology of R&D Activities 30

Appendix ‘B’ – EGG Membership 31

Appendix ‘C’ – References 32

EXECUTIVE SUMMARY

Objectives

The objective of this initial R&D phase of the *NEXTschool* project has been to conduct a research of literature, expertise, and practices related to innovation in the organisation of secondary school, in our attempt to address the needs of the next and future generations of students. The expected outcome is a shared realization that the changes that need to be made to the conventional high school experience are urgent and dramatic; and that the most significant challenge is the ‘culture shift’ that will be required to achieve such a transformation.

Process

The R&D phase took place over an eighteen-month period and included literature search and reviews, participation in major innovation conferences, visits to exemplary high schools settings, and interviews with innovative researchers, leaders, and practitioners. It should be noted that our findings and conclusions at this point are observational and will be subject to the rigors of the projects upcoming design phase.

Findings

There is a widely-held belief, shared by educators and public alike, that high school as we know it is rapidly losing pace with the changing world around it, an evolving and unpredictable labor market, and most importantly a generation of students who are becoming less engaged with the processes we currently employ to achieve learning outcomes. In short, high school as we know it is long overdue for a complete ‘makeover’.

Readiness

The English school boards of Québec, with a graduation rate of 85%, present a relatively low risk environment, and have a long history of innovative practices, advanced technological infrastructure, and extensive professional development opportunities. The Québec school curriculum (QEP) ranks among the ‘Top-5’ innovative curricula in the world, and the government has renewed its focus on and funding for the application of innovative and alternative approaches to conventional ‘delivery of instruction’ models.

Primary Conclusions *(see page 28 of report for complete list)*

- ‘Adaptability’ is the universal skill for the 21st Century, and applies to both the learner’s skillsets and the invariable reorganization of the school experience.
- Sustainable and scalable innovation, particularly for high school, is wholly dependent on a ‘systems-thinking’ approach to organizational transformation.
- The establishment of ‘clusters’ or ‘schools-within-schools’ is essential to ensuring the flexible and interdisciplinary organization of learning experiences.
- The assumptions and principles underlying the *NEXTschool* project have been validated, supported, and are part and parcel of a global change movement.

Core Recommendation *(see page 29 of report for complete list)*

- That the project be approved for a ‘Design Phase’ and mandated to develop a framework for the future piloting of *NEXTschool* in a variety of settings.

INTRODUCTION

We are pleased to present the preliminary report on Phase 1 of the *NEXTschool* project. This phase constitutes the research and development work that has been undertaken with the approval of the Directors General of the English School Boards of Québec (ADGESBQ), following a review by the Directors of English Education Network (DEEN). This report is a prelude to the proposal of a Design Phase and subsequent piloting of the *NEXTschool* project. The research has been conducted over the past eighteen months and includes an extensive sourcing of literature related to the project, physical and virtual visits to innovative high school settings, participation in a series of world-class conferences and workshops, as well as numerous interviews with leading global innovators and educational practitioners

The inspiration for the *NEXTschool* project derives from three sources. The evolution of the Community Learning Centers project in Québec over the last ten years, the design and aspirations of the Québec Education Program (QEP), and at its root, the outcome of a design workshop generated by a staff of high school teachers who were challenged to ‘invent’ the high school of the future.

Objectives

The objective of this initial phase of the project has been to conduct a thorough research of literature, expertise, and practices related to innovation in the organisation of secondary school in our attempt to address the needs of the next and future generations of students. The expected outcome is a shared realization that the changes that need to be made to the conventional high school experience are urgent and dramatic, and that the most significant challenge is the ‘culture shift’ that will be required to achieve such a transformation.

The *NEXTschool* project has as its objective the development of a framework for the high school of the future that is responsive to natural learning patterns and can function within current regulatory parameters, and collective agreements, as well as government curriculum and legislation. We are convinced that such a school of the future is possible if undertaken as a whole-school initiative that integrates the organization of curriculum, scheduling, and the learning environment by employing a ‘systems-thinking’ approach. The original proposal was for a three-year project, beginning in year one with research, design, and school board engagement; continuing in year two with a preparatory transition in selected schools; and year three with the initiation of project pilots in a number of high schools. The project is intended to be the foundation for a wider implementation of this approach and will require significant preparation prior to piloting and implementation in schools. The objective is to create a menu of options for the possible large-scale application of these practices across the Québec school system rather than a singular recipe for success in individual settings.

Using the elements and successes of the Community Learning Centers (CLC) initiative as a starting point, the *NEXTschool* project expects to develop a prototypical model of a next-generation CLC ~ one that will nurture an ‘interdependent’ school-community environment that engages students with the local and global communities in a knowledge-based economy and which embodies the concept that learning occurs in an organic eco-system, and not uniquely within the confines of a building. The central premise of *NEXTschool* is the manifestation of the student-centered learning practices that have already been well researched and developed in response to the current limitations of conventional high school settings. This is why we refer to *NEXTSchool* as “Student-Centered, Teacher-Driven, Globally Connected, Community Engagement”.

This report will begin by providing the context and background of our approach, the challenges anticipated, and continue with our findings, concluding with a set of recommendations for the implementation of a second Design Phase of the *NEXTschool* initiative.

Why *NEXTSchool* ?

This is not an easy question to answer as it challenges many of the elements of formal education that we currently take for granted. After all, we have been teaching our children in essentially the same manner for the past two hundred years and it appears to have worked thus far, so why change now?

Arne Duncan, the former Secretary of Education in the U.S. argued the following:

“Until now the goal has just been ‘to get people to graduate’. But graduation alone is not enough. There are far too few decent jobs for such people anymore, and few or none for the young person without a high school degree. However a high school education must prepare students for the next step of education or “skill building”. That’s the fundamental shift. We should have made that shift twenty –five years ago. But we didn’t, so we have to catch up.” (2016)

While Duncan maintains that changing our schools should have occurred a generation ago, that significant change has not taken place. Many, if not most of our schools still employ didactic methodologies that do not support holistic learning, nor contribute to the development of cross-curricular competencies such as team building and communication skills. We need to make the next leap to systemic change. It is why there is an urgent need for a structural reformulation of formal education as we know it. The current fear of educators and citizens alike is that school will not be able to keep pace with the changes and expectations impacting on it. (Economist: Intelligence Unit, 2017).

Peter Barnard (2013) reflected, in a rhetorical fashion, on the question of what purpose schools serve today and paraphrased Tyack and Cuban in their book entitled *Tinkering With Utopia* (1995) in which he maintains that much of the reform we have seen thus far amounts to no more than “tinkering with the system” when in fact system-wide

change is required. Reformers have been comfortable with limited patch-work solutions that address issues at the periphery of the problem while using Industrial Age tools that are out of step with the demands of the Information Age (Friedman, 2012). We see governments and bureaucrats constantly throwing enormous amounts of public funds at interactive whiteboards, and new ‘apps’ for tablets, while expecting to see deep change or improvement as a result. Google classrooms are not the solution if they are not intrinsically linked to effective pedagogy. Barnard (2013) highlights how schools are not the products of accident, but of inherited and out-dated design that inhibits our ability to change.

There is no question that it is hard to change. It is certainly frightening; given that we are referring to the education of those who in the coming years will be asked to sustain our businesses, governments, and institutions. The real questions we need to ask ourselves are, “What happens if we don’t change?” and “Who will assume the responsibility for having complacently accepted the status quo?”

Not only does everyone today need personalized and enhanced education to develop the critical thinking and problem-solving skills that are now necessary for any good job; students also need an education that nurtures them to be independently creative servers. That is, “*We need our education system to not only strengthen everyone’s basics; reading, writing, and arithmetic, but to teach and to inspire - to add something new, something extra, or to adapt something old in whatever job they are doing.*” (Friedman, 2012).

Schools that answer the needs and interests of youth today need to be highly relevant, responsive and constantly adaptive and evolving. There is no place for a static model of school in the 21st Century. Everyone has heard how in the future people will have numerous jobs and careers, many of which do not exist today and for the time being remain indefinable. The solution clearly is not more of the same. As Einstein famously said, “*The definition of insanity is repeating the same thing over and over again, and expecting a different result.*” (Isaacson, 2007, Rainie, 2016)

The *NEXTschool* project is about transformational, systemic change that results in an environment that is substantially different from what we know now. We must align ourselves with the needs of the Information Age as described by Duffy (2008) and, “*...apply system drivers that alter the current culture, that are deep and pervasive, that are intentional, and that nurture a school environment that “continuously seeks an idealized future for itself.”*” (2008). The *NEXTschool* project is not just an interesting idea, or another ‘flavour of the month’ – it is our public responsibility - what Michael Fullan (2003) describes as our ‘Moral Imperative’.

To put it another way, Ken Robinson refers to the ‘myth of education’ that permeates our daily practice to this day; “*Young people go to elementary school mainly to learn the basic skills of reading, writing, and mathematics. These skills are essential so they can do well academically in high school. If they go on to higher education and graduate with a good degree, they’ll find a well-paid job and the country will prosper too.*” (2015)

Context

To provide an appropriate context that situates the principles behind the *NEXTschool* project; we need to briefly revisit the history of school and community relationships over the last 150 years. The research we have uncovered leads us to an exposé of the relationship between school and community over three eras; Then, Now, and Next. It is well documented that compulsory public education arose from the rapid development of the industrial economy of the 19th century, and served as a vehicle for the legal exclusion of children from the labor force (Booth et al, 2013). Education in the ‘Then’ era relied exclusively on school-bound learning experiences and teacher generated knowledge, delivered within a culture of compliance. Learning was confined within closed boundaries through which only minimal social interaction with the outside world was permitted. The guiding principle of school at the time was that its function was to serve the community and provide training for the labour market. Let’s fast-forward to the educational innovations of this century and we find ourselves in the ‘Now’ era, an information-based economy demanding of schools a culture of cooperation rather than compliance. Schools responded with controlled boundaries and are more dependent on community-based knowledge. Moderate social interaction with the wider community is encouraged, primarily through extracurricular activities. Community service as a part of school life is now in vogue, as exemplified in projects such as Québec's Community Learning Center Initiative, International Baccalaureate programs, and many private school service-learning programs.

As we look ahead to the expectations of 21st Century schooling, we can foresee ourselves transitioning to a ‘Next’ era in which a knowledge-based economy demands the stimulation of creative efforts by students for the development of learner-generated knowledge. The anticipated culture is one of collaboration with minimal and permeable boundaries coexisting between school and community. The school-community relationship becomes one of symbiotic interdependence whereby the guiding principle is that community and school are at the service of each other in the development of a continuously adaptive citizenship. The comparative characteristics of these three eras are illustrated in the following chart:

	THEN	NOW	NEXT
ECONOMY	Industry-based	Information-based	Knowledge-based
COUPLING	by Mandate	by Association	by Purpose
KNOWLEDGE	School-based	Community-based	Student-based
CULTURE	Compliance	Cooperation	Collaboration
BOUNDARIES	Closed	Controlled	Minimal
OBJECTIVES	Exclusive	Complementary	Harmonized
INTERACTION	Minimal	Moderate	Fluid

© nEDworks/LEARN 2017

While this evolution is experienced as slow-moving because of the extensive time over which it has occurred, it is important to note that the rate of change in society, as evidenced by innovations like artificial intelligence, is itself increasing at an exponential rate. This accelerating rate of change has resulted in significant challenges

to conventional education practices. In his seminal work on change entitled '*Schools That Learn*', Peter Senge (2012) identifies five key challenges to the status quo of school organization:

- *Accelerating pace of knowledge* - as characterized by such plentiful information sources as Wikipedia and Google scholar;
- *Worldwide interdependence* – manifested in manufacturing processes by which robots assemble products from materials that are sourced from around the globe;
- *Economic stress and social uncertainty* - as witnessed by the current instability in the management of global politics and natural resources;
- *Rapid technological change* - as attested by the advent of virtual reality and artificial intelligence; and finally,
- *Growing public frustration with the quality of education* - perhaps a cover for their unfulfilled expectations about school's ability to 'keep up'

We are reminded here of a less famous quotation of Charles Darwin in which he elaborates on the notion of the 'survival of the fittest'; "*It is not the most intellectual or the strongest species that survives, but the species that survives is the one that is able to adapt to or adjust best to the changing environment in which it finds itself.*" (Moran et al, 1982)

NEXTschool is therefore an attempt to answer the call for schools to become more proactive in their approach to constantly changing needs of students and their communities. One of the leading proponents of 21st Century skills, Charles Fadel (2015) defines the 21st century skill set as a four-dimensional construct that includes knowledge, skills, and character; complemented by the proposal of a fourth element which he identifies as 'meta-learning', more commonly understood as metacognition or 'learning to learn'. This concept strikes at the heart of the expectations of a future vision of school in which the singular skill for the 21st Century will be the capacity of adolescents, as emerging adults, to continually identify, understand, and situate themselves throughout their lifetime in an uncharted future world.

The emerging expectations for high school are perhaps best amplified through the voices of students themselves, through which we are acquainted with an acutely aware and savvy perspective on schooling. A comprehensive research study entitled '*Project Tomorrow*' (2011) reveals students, as a cohort of 1900 participants, responding with the following set of expectations for the high school of the today:

- The co-creation of knowledge,
- Interdisciplinary and applied learning,
- Real-world problem-solving challenges,
- Entrepreneurial and leadership experiences,
- Career and personal growth orientation, and
- Generic and transferable life skills.

The ready availability of instantaneous worldwide news and knowledge-rich information has led students to become increasingly wary of the future and acutely

NEXTschool R&D Report 8

sensitive to problems facing their world. This level of externally sourced knowledge has also led to an evolving disenchantment with the credibility of high school as a trustworthy preparation for their future. When exposed to works such as the United Nations ‘*Millennium Project*’ and its identification of global survival challenges; students are surprisingly conversant and passionate about the big picture challenges facing our world today. The project identifies 15 global challenges to Sustainable Development, as illustrated in the chart below. In the context of the school’s ability to respond to the external forces that impact on its stated curriculum; the inference is that the ongoing relevance of school is directly proportional to its ability to acknowledge and respond to the critical challenges that lie ahead for our students in a world in which they will be expected to survive and thrive.



(Millennium Project, 2017)

If we reflect on our earlier discussion of school-community relationships ‘Then’ and ‘Now’, it is evident that the enduring structures of school and its organization of learning remain mired in a ‘Then’ reality of school-based knowledge embedded in a culture of compliance, inhibited by closed boundaries and minimal community interaction. As such, the very survival of school as a viable preparation for citizenship in the 21st Century is at risk. According to Prince and Swanson (2016), school's ability to adapt to a rapidly changing reality is actually decelerating in relation to the rate of change swirling in the world around it.

If the name of the game is “Pass the test of school and apply learning to life”, we do extraordinarily well, as evidenced by conventional recipe-based curricula and a finely tuned assessment culture. The game, however, has changed to “Apply life to learning and pass the test of performance”, and at this we fail decisively. In a recent ‘Tell Them From Me’ survey in a large school board an interesting anomaly was revealed. Senior

students, who were scoring among the top academic performers in the province, expressed a distinct level of ‘disengagement’ with school. This should be disturbing to us in its suggestion that student’s valuing of school has been seriously compromised by the discouraging experience of ‘playing the game’ and filling in time, while stressing about their future prospects.

As we turn our attention to the external environment, Chris Grams (2013) offers up a sobering look at the expectations of the labor market in the following graphic in which he elaborates on the ‘*Enemies of Adaptability*’. In this exposé of the corporate world’s attempt to build adaptability into the workforce, Grams identifies twelve challenges to organizational adaptability that impede their responsiveness to the forces impacting on them.



On closer examination, the majority of these traits could be easily attributed to the organizations we call schools, which manifest a bygone reflection of society and continue to fall short in addressing the majority of these twelve challenges.

#1: Hierarchy - *Top-down, control-based hierarchical structures discourage individual initiative and reduce autonomy.*

#2: Fear - *Command-and-control systems lead to organizations filled with anxious employees who are hesitant to take the initiative or trust their own judgment.*

#3: Decision Bias - *Defensive thinking, fossilized mental models, and contentment create a bias in favour of the status quo.*

#4: Habit - Lack of proactive change often has to do with mindsets and behaviours: we must want to change, and also understand how to change.

#5: Centralization - When the responsibility for making big decisions is concentrated at the top, a handful of executives favouring status quo can thwart change.

#6: Inflexible Business Practices - Optimized business systems are efficient, but assets, skills, and processes are more specialized, and change becomes more incremental.

#7: Rigid Structures - In many organizations, rigid unit boundaries, functional silos, and political fiefdoms hamper the rapid realignment of skills and assets.

#8: Skills Deficit - Employees don't have skills, training, and coaching they need.

#9: Short-term Thinking - Compensation and incentive systems often truncate executive time horizons and skew perspectives.

#10: Insufficient Experimentation - Management processes arrive at the "one best strategy" through top-down, analytical methods, without bottom-up experimentation.

#11: Lack of Diversity - Management systems value conformance and cohesion at the expense of diversity and divergence.

#12: Lack of Purpose - A paucity of organizations without a shared purpose may have trouble aligning on a natural path for adaptation. (Grams, 2013)

Of particular relevance to our work is the challenge of rigid structures. We need only to look at the following example of a typical high school student schedule to witness a systemized obsession with what we refer to as the 'compartmentalization' of learning.

Monday (1)	Tuesday (2)	Wednesday (3)	Thursday (4)	Friday (5)	Monday (6)	Tuesday (7)
7:50 Class 1 English	7:50 Class 1 Reading	7:50 Class 1 Math	7:50 Class 1 PE	7:50 Class 1 Social Studies	7:50 Class 1 Science	7:50 Class 1 Art
9:05 Morning Meeting	9:05 Advisory	9:05 Electives	9:05 Class Meeting	9:05 break 9:25 Class 2	9:05 Morning Meeting	9:05 Assembly
9:55 Class 2 Math	9:55 Class 2 Music	9:55 Class 2 Social Studies	9:55 Class 2 Science	Spanish 10:40 break 10:55 Class 3	9:55 Class 2 English	9:55 Class 2 Reading
11:10 Lunch / Recess / Homework Help	11:10 Lunch / Recess / Homework Help	11:10 Lunch / Recess / Homework Help	11:10 Lunch / Recess / Homework Help	Reading	11:10 Lunch / Recess / Homework Help	11:10 Lunch / Recess / Homework Help
12:10 Class 3 Social Studies	12:10 Class 3 Science	12:10 Class 3 Art	12:10 Class 3 English	12:10 Lunch / Recess 12:50 Class 4 Music	12:10 Class 3 Math	12:10 Class 3 PE
1:25 Recess	1:25 Recess	1:25 Recess	1:25 Recess	2:05	1:25 Recess	1:25 Recess
1:45 Class 4 Spanish	1:45 Class 4 English	1:45 Class 4 YO	1:45 Class 4 Math		1:45 Class 4 Social Studies	1:45 Class 4 Science

Google Images

A second look at this schedule, in contrast to the outer world, reveals a number of awkward and unintended results. First of all, the working week is a cycle of seven rather than five days. Secondly, we see the learning experience fragmented into eleven

disciplines and study areas, a complete contradiction to the way we naturally experience the world, learn, and generate knowledge from it. Further, there is no apparent purpose to the times of day at which these disciplines are scheduled, which appear to be more random than purposeful to the learner. Thirdly, we see the restriction of learning within rigid blocks of approximately one hour, creating the false assumption that students are ready, willing, and able to master specific elements of knowledge at arbitrary times and for variable durations. What is even more perplexing is that this is not even a uniform schedule; as there probably exist as many as twenty variations of this schedule applied to various students within a grade level, in turn, a significant inhibitor to collaboration among teachers and students. Such organization of learning is clearly more focused on the efficient operation of the school and teaching-time allocations than it is on needs of the students and the characteristics of effective learning.

To put this obtuse view of the world in perspective perhaps a reality check is in order. David Hood (2015) in *'The Rhetoric and the Reality'*, best illustrates the folly of this compartmentalized approach to secondary school teaching and organization. The story is called *'Disenchanted Workers'* and it goes like this:

My friends and I started work with the same company at the same time. On our first day we were sent to a room with a supervisor. We were given the company rules – there are a lot of them – and told what was expected of us. We were given our first work to do.

After one hour a bell rang. We all trooped off to another room with another supervisor with a different personality, different expectations, and different work to do. Every hour the same thing happens, five days a week, every week of the year. During each week we have eight different supervisors; not one of them has explained if there are any connections between the work we have to do for each. We have discovered that supervisors don't do any co-operative planning so there is no overall plan, no cohesion in the work we are doing.

With a supervisor we all get the same work to do: some of it is interesting, but most of it is dull, boring and repetitive. Some of the workers are considered to be 'less bright' than the rest of us; they're put into different groups and the work is 'dumbed down' because it is assumed they cannot do what the rest of us do.

We have little say in what we do. We are not consulted; we are not asked if we have any ideas on how to make the work more interesting, or how to improve the quality of our work. 'Discipline' is tight. We have no union to represent us; there is even a suggestion box.

Our company seems not to have read any of the research that shows that interesting work and involvement in decision-making that impact on employee's work are essential to job satisfaction. Instead it operates on the traditional theory of human behavior known, I think, as stimulus-response psychology – the belief that people can be made, through reward and punishment, to do with the supervisor wants them to do, whether they like it or not.

Most of the supervisors expect us to take work home with us every day and

at the weekend. However it is rarely checked, so most of us do as little as we can get away with.

We get little constructive feedback on our work. Instead our progress is assessed through 'tests' rather than the work we do during a normal day. The company has the view that work you do with others is 'cheating'. After three years we get tested by someone outside the company who we've never met. We have to hope that what the supervisors have given us fits with what this person expects. Everyone in the company gets the same tests. You get marks or grades. If you get a 'failing' mark or grade it is made pretty clear that you have few career prospects in the company, or the industry.

You do have some opportunity to transfer to another branch, but by all accounts they all run on much the same ones.

The name of our company? It's called secondary school!

Assumptions

Confronted with the many daunting challenges that face educators and administrators today, we began our research by trying to focus on the larger barriers to innovative learning environments. While we observed many successful innovations including Problem and Project-based learning, Universal Design for Learning, STEM and STEAM programs, the International Baccalaureate and Inquiry-based Learning, to name a few; it became apparent that while these initiatives have been successfully implemented at a localized classroom, school, or board level - they demonstrate a distinct incapacity to be 'sustainable', which is to say have a long life span, or 'scalable' which is to be replicable on a system-wide basis. In other words these innovations are not easily replicable because they are rarely implemented on a 'systemic' basis, which would entail embedding them in the culture of the school. Our curiosity then led us to identify barriers that impede a systemic response to the challenges facing our conventional organization of high school education. The scope of the *NEXTschool* project is therefore to develop a system-wide framework for teaching and learning that is both sustainable and scalable across the province's network of high schools.

Our initial assumption is based on a perception among educators that school as we know it is rapidly losing pace with the changing world around it, an evolving and unpredictable labor market, and most importantly a generation of students who are becoming less engaged with the processes we currently employ to achieve learning outcomes. Further to this assumption is an urgent and universal appetite for significant change to occur over a short period of time. (Pearlman, 2002) This impression has been confirmed in multiple conversations we have had with a full range of stakeholders and is shared by parents, teachers, students, and administrators alike. As such, this serves as a powerful motivator and driver for the advancement of the *NEXTschool* project.

Our second assumption is that the inability of formal educational settings to keep up with a rapidly changing world is not a result of poor teaching practices or the availability of innovative pedagogies; but is primarily due to the inhibitive structure

and culture of high school as we know it, and which we have perpetuated for over one hundred years. We began with the premise of three structural barriers to good teaching practices and responsive learning environments, falling under the broad categories of Matter, Space, and Time. Matter refers to the content of learning in the prescribed curriculum and the compartmentalization of learning into specific disciplines at the high school level. Space refers to the setting of learning experiences, whether it is within a classroom, a school, or in a lab or workshop in the wider community, as well as the broader spectrum of learning in a global context. Time refers to the synchronization of the time occupied in the teaching-learning relationship within a scheduled day and the distribution of curricular-specific time-on-task across that schedule. Although this may seem an oversimplification of a complex set of elements and relationships; it was important for us to remain focused on the larger systemic barriers to avoid getting ‘lost in the trees’. We were and remain convinced that these structural barriers are the primary inhibitors to the sustainable and scalable innovative educational practices that have been successfully implemented, although on a limited and sporadic basis, throughout the developed world.

Our third assumption regards the infrastructure that constitutes the framework and boundaries of teaching and learning in Québec. We are convinced that our curriculum, the Québec Education Program (QEP), the teachers’ Collective Agreement, the Basic School Regulations, and the Québec Education Act are already configured in a sufficiently flexible fashion that they are capable of supporting this level of comprehensive change (MEES, 2016). The core principle at play here is the decentralization of control over the teaching-learning process. In effect it is our belief that the mantra of ‘letting go’ is one that permeates *NEXTschools* ambitions – which advocate the Principal ‘letting go’ of the need to control when and where teaching and learning takes place – Teachers ‘letting go’ of constraining the myriad interests and learning needs of the classroom – and Students ‘letting go’ of the obligation to accumulate knowledge without context or interest. To paraphrase Alan November, “*We need to find the way, show the way, and get out of the way.*” (2012).

The application of ‘Project-based Learning’ (Larmer, et al, 2015) for example, enables us to both accommodate student-centered learning and benefit from the untapped creativity and resourcefulness that resides in each student when activated through their personal areas of interest. Or as Ken Robinson put it – “*...our job is not to command and control - but to provide climate control*” (2015). This is to say that our role as educators is to provide the optimal conditions for 21st Century learning to occur. The *NEXTschool* project strives to identify and embed these conditions in a flexible framework for the future in our high schools.

KEY FINDINGS

A Global Perspective...

As our research unfolded we quickly became inundated with what could easily be called a ‘tsunami’ of literature on educational innovation and practice. As a result we sought out a research source that would give us a broader perspective and a comprehensive understanding of promising educational innovations on a global scale. The Organization for Economic Cooperation and Development (OECD) is perhaps best known in educational circles as the purveyor of the infamous PISA tests that are conducted in its seventy-two member countries to determine and rank the level of proficiency among adolescents in Mathematics, Science, and Literacy. One of the lesser-known but more fitting initiatives that the OECD has commissioned is the Center for Educational Research and Innovation or CERI. Over the past ten years this agency has initiated extensive worldwide research on educational innovation and has conducted a series of studies that have resulted in three seminal reports. The first, entitled ‘*The Nature of Learning: Using Research to Inspire Practice*’ (Dumont et al, 2010), sought to understand and illuminate the latest developments in our understanding of how people learn best. This initial study generated a set of seven ‘*Principles of Learning*’ that were conceived as the measures of effective schools. We are convinced should that these constitute a reliable rubric for the assessment of the presence of the appropriate innovative practices to address transformational needs of a *NEXTschool* environment. These are summarized in the following table:

OECD’s 7 PRINCIPLES OF LEARNING:

Learner centredness

The learning environment recognizes the learners as its core participants, encourages their active engagement, and develops in them an understanding of their own activity as learners.

The social nature of learning

The learning environment is founded on the social nature of learning and actively encourages well-organized c-operative learning.

Responsiveness to motivations and emotions

The learning professionals within the learning environment are highly attuned to the learners’ motivations and the key role of emotions in achievement.

Sensitivity to individual differences

The learning environment is acutely sensitive to the individual differences among the learners in it, including their prior knowledge.

Demanding of the learner

The learning environment devises programs that demand hard work and challenge from all without excessive overload.

Assessment for learning

The learning environment operates with clarity of expectations and deploys assessment strategies consistent with these expectations; there is a strong emphasis on formative feedback to support learning.

Horizontal connectedness

The learning environment strongly promotes ‘*horizontal connectedness*’ across areas of knowledge and subjects as well as to the community and the wider world.

(Dumont et al, 2010)

The second OECD publication of this series, *‘Innovative Learning Environments’* (OECD, 2013), reports on a series of case studies, spanning the globe, that showcase exemplar schools where evidence of these seven principles are manifested. The most recent report, entitled *‘Schooling Redesigned: Towards Innovative Learning Systems’* (OECD, 2015), is an extensive analysis of design principles and conditions that have successfully rendered, using a ‘systems’ approach, the implementation of the seven principles of learning. As such, the studies conducted by the CERI and OECD have validated our intuitive assumption that a ‘systems-thinking’ approach is key to the successful implementation of scalable and sustainable innovation. As a byproduct of this discovery, we have sourced and collated a series of abstracts from more than 150 articles cited in the CERI studies to serve as a portfolio of resources in the mapping of our further exploration (see NOTE following the Reference section of this report for a link to these articles). Another ripple effect of the CERI studies has been the accelerated the adaptation of PISA testing to concentrate on deeper ‘problem solving skills’ through situational assessment and a de-emphasis on the STEM skills. (PISA, 2003)

Overall the confirmation of these assumptions has led us to believe that the *NEXTschool* project, through a ‘systems-thinking’ approach, is both a viable and promising strategy for scaling up bona fide innovative practices across our entire high school network.

Emerging Pedagogies ...

Our conversations and correspondence with globally recognized innovators including Michael Fullan, Peter Senge, Pasi Sahlberg, and Alan November have confirmed our assumption that the necessary conditions for successful system-wide innovation are currently in place in Québec. Further, we have identified emerging pedagogies that are conducive to organizational transformation at the high school level. These are the concepts of *‘Higher Order Thinking’*, *‘Personalized Learning’* and *‘Project-based Learning’*.

There is clearly a need for a set of learner outcomes based on the premise that the nature of work, civic, and everyday life is changing and therefore increasingly requires that formal education provide young people with the mastery of skills such as analytic reasoning, complex problem solving, and teamwork (Bitter et al, 2015). This is embodied in the concept of Higher Order Thinking Skills (HOTS), which are based on the *Taxonomy of Educational Objectives* first developed by Benjamin Bloom and associates in the early 1950s, and updated fifty years later (Anderson et al, 2001). As established by their sustained use as the standard for the design of curricula; the taxonomy performs the dual function of differentiating the types and depth of learning objectives, as well as providing a critique of conventional education’s focus on the lower order thinking skills of memory, understanding, and application. The intention and expectation of the current movement is to encourage the application of the higher order thinking skills of analysis, evaluation, and creativity. Simply put, this encourages the “process of learning for transfer,” allowing a student to apply what’s learned in one situation to others (Pellegrino, 2012).

Personalized Learning refers to a diverse variety of educational programs, learning experiences, instructional approaches, and academic-support strategies that are intended to address the distinct learning needs, interests, aspirations, and cultural backgrounds of individual students. Personalized learning is generally seen as an alternative to conventional “one-size-fits-all” approaches to schooling (Clarke, 2013)

Project-based learning (PBL) refers to any programmatic or instructional approach that utilizes multifaceted projects as a framework for enhanced learning experiences. When engaged in project-based learning, students will typically be engaged in activities that require them to use diverse skills—such as researching, writing, interviewing, collaborating, or public speaking, in order to prototype and develop various ‘products’ (Bender, 2012). PBL is a dynamic approach in which students actively explore real-world problems and challenges and benefit from deeper learning experiences. The primary advantages of this approach are its focus on student-centeredness and the simulation of real-world work.

Of special interest to the project within the Québec context is the pedagogy of ‘Deep Learning’ developed by Michael Fullan. The Deep Learning approach systemically frames learning around six components; Creativity, Critical Thinking, Communication, Character, Citizenship, and Collaboration, referred to as the ‘6Cs’. (Fullan et al, 2017). As such, the model displays a remarkable affinity with the tenets and principles of the QEP; and speaks to the relevance and strength of the Québec curriculum and its capacity to support flexible implementation through the application Competency-based Learning and the integration of Cross-curricular Competencies, and Broad Areas of Learning. (MELS, 2004).

Our thinking thus far is that these pedagogies have a symbiotic relationship, in that the practices of Higher Order Thinking can be more successfully achieved and retained through the employment of Personalized skill development, as applied in Project-Based Learning environments. The proposed Design Phase of the NEXTSchool project will attempt to seek alignment and synchronization of these and other pedagogies to develop a portfolio of resources for differentiated *NEXTschool* applications. The cautionary tale here is that, as educators, we have all witnessed the intense and often exclusive attention that is paid to the adoption of innovative pedagogical approaches and teaching methodologies. As previously stated, these can be highly successful initiatives on an individual teacher or school basis; but typically rely on the dedicated leadership of a teacher, a teaching team, or the principal of a school to provide leadership and support that is by its very nature transient (Ritchhart, 2015).

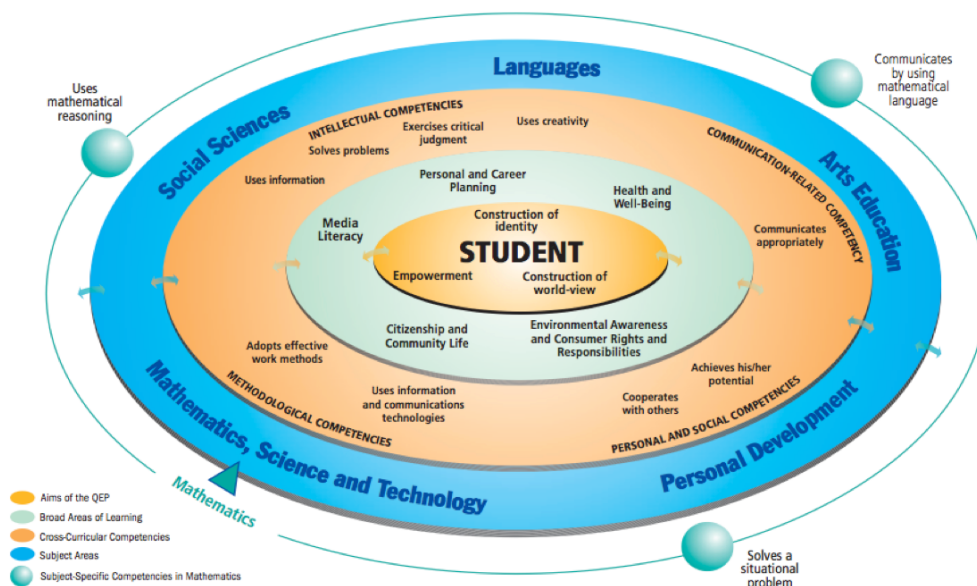
Of all the elements mined from the many innovations studied, the most common is the absence of an organizational framework needed to sustain these innovations on a school-wide or system-wide basis. The pivotal takeaway is that the design phase should focus on developing prototypes for the structural and cultural transformation of the high school environment. We must remain mindful that *NEXTschool* is neither a program of studies nor a specific teaching methodology; but a systems-based framework that will support a variety of innovative learning initiatives, present or anticipated. As such, the *NEXTschool* framework must be designed to coexist with a full range of programming, for example as a *NEXT-IBschool* or a *NEXT-STEMschool*.

Setting

The *NEXTschool* project proposes to initiate a number of pilot projects in public high schools within the nine English school boards of Québec. The advantages of this setting are threefold:

First, the English school boards of Québec currently enjoy a high school graduation rate of about 85% (MEES, 2014). This is 13% higher than the overall provincial success rate and 15% higher than that of the member countries of OECD (2017). As a result, the risk factor for the project related to student academic success is relatively low.

Second, the Québec curriculum, QEP schema below, informally ranks among the top five innovative curricula in the world, based on its application of socio-constructivist learning, the employment of competency-based pedagogy, interdisciplinary approaches, and its goal-oriented focus on cross-curricular competencies and lifelong learning skills. (MELS, 2004)



Third, and most importantly, is the level of readiness that is apparent in the English sector schools by virtue of our long history of innovative practices, an advanced technological infrastructure, and extensive professional development opportunities.

An additional opportunity is presented by the current government, which has recently generated a renewed focus on and funding for the improvement of student success rates through the application of innovative and alternative approaches to conventional ‘delivery of instruction’ models. (MEES, 2017)

***NEXTschool* Levers**

Employing the criteria established through OECD's Seven Principles of Learning, our reflection has led us to identify, within the Québec environment, what we would refer to as 10 *NEXTschool* levers for change:

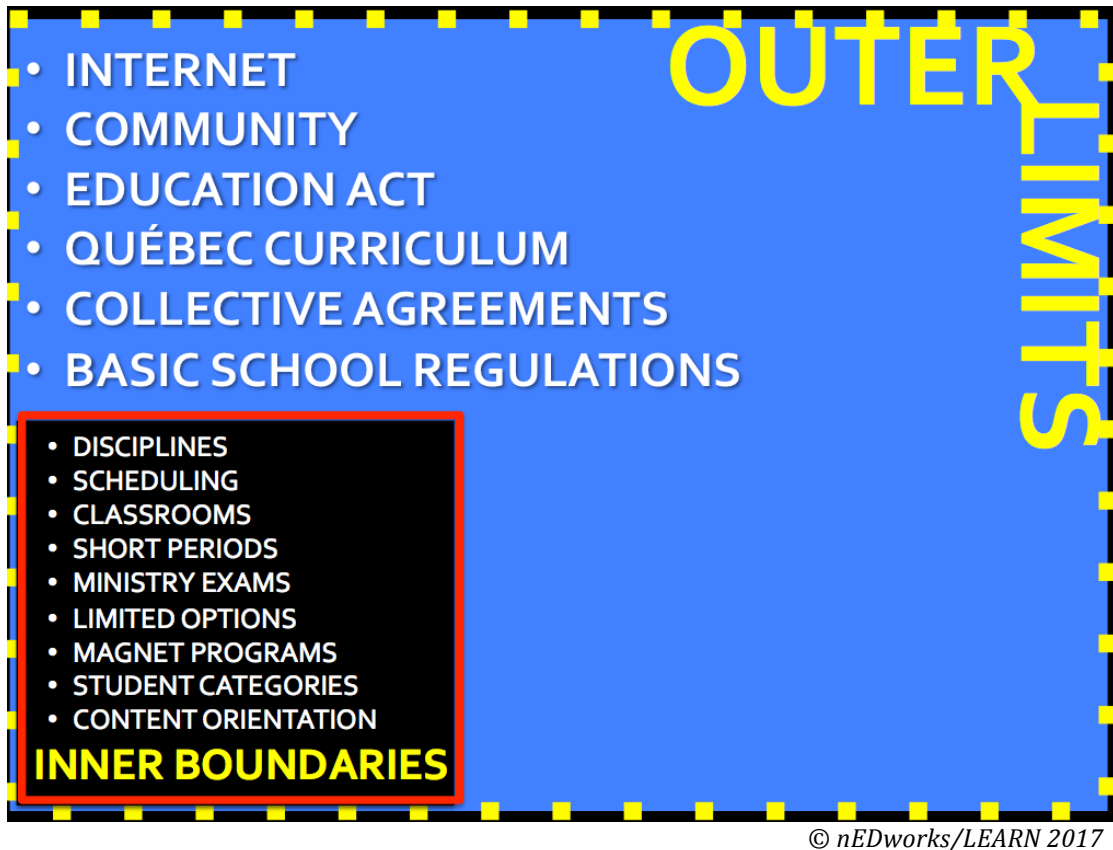
1. Competency-based curriculum
2. Lifelong, generic, and transferrable skills
3. Interdisciplinary project-based learning
4. Career-oriented learning experiences
5. Adaptive evaluation methodologies
6. Instructional management system (LMS)
7. School-within-school structures (clusters)
8. Flexible scheduling of learning time
9. Personalized learning plans for all (IEPs)
10. Community service and problem-solving

© nEDworks/LEARN 2017

Of the 10 elements listed above, we are confident that the first four are sufficiently addressed within the Québec curriculum (QEP) and a number of related initiatives. The remaining six essentials suggest to us the major components of a structural reformation of the conventional high school setting at the local level. As a result, we propose these to be the foundational building blocks for the transformation that *NEXTschool* advocates.

Nuts and Bolts...

As we dug deeper into the design and mechanics of the conventional high school, we began to realize that we have been complacent in our reliance on a number of conventions that constrain our organization of formal learning at the high school level. We have identified these as the 'outer limits' and the 'inner boundaries' of school organization. As seen in the chart below, the outer limits are those that impact school externally, such as the Internet, community expectations, legislative regulations, and collective agreements that serve to govern our provision of educational programming.

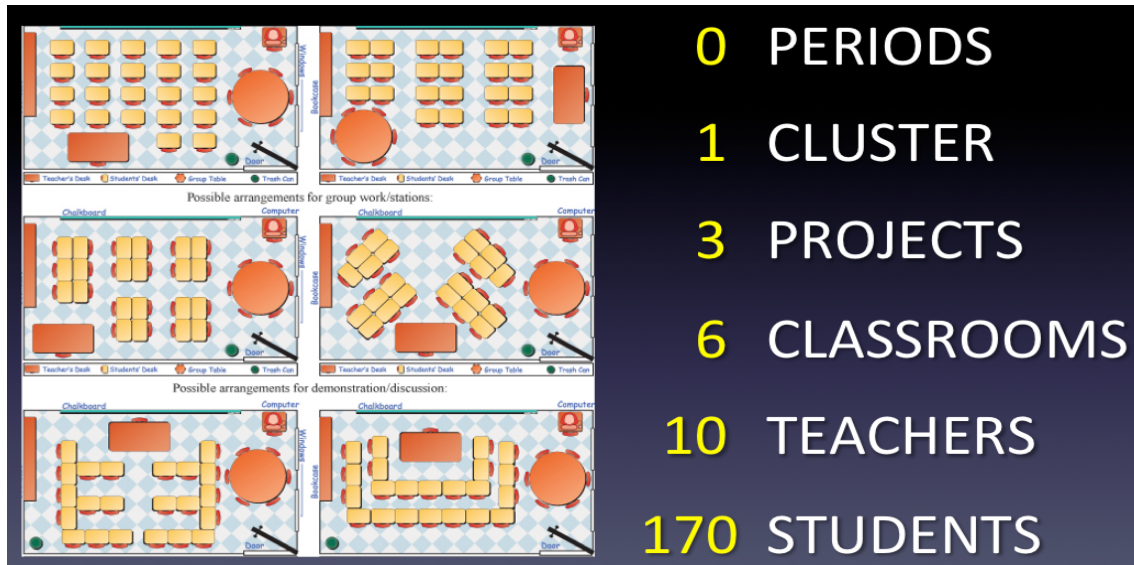


Our lasting inhibitions lie in a second set of inner boundaries that have been established over time. They are assumed to be the accumulation of best practices, but actually constitute a rigid set of limitations on our ability to organize formal learning in a flexible and adaptable fashion. Our discussions with innovative educators and visits to exemplary school environments has led us to conclude that these inner boundaries are locally derived, unessential, and often counterproductive to effective learning experiences. These are the division of learning into disciplinary compartments, the disruptive scheduling of learning experiences in random fashion, the restriction of the learning experience to formal classroom environments, the fragmentation of learning into short and sporadic periods, standardized testing, limited options for knowledge generation and application, magnet programs that inhibit diversity, and an enduring obsession with the ‘covering of content’. As constraining as these sound by exposing them here, they remain the unchallenged conventions restraining the design and structure of flexible and adaptable learning environments in our high schools.

Convergence and Divergence...

Our experience through readings, research, workshops, and conversations has been one of the continuous and cyclical convergence and divergence of ideas. The constant ebb and flow across the many elements of the complex system that is formal education leads us to conclude that there are critical stress points that serve to frame the *NEXTschool* design process moving forward.

Our understanding is that high schools, particularly the larger ones, need to be subdivided into workable structures that we are referring to as ‘clusters’. Although the ‘school within school’ movement, such as middle school, has been around for some time (Deweese, 1999); the inspiration for the *NEXTschool* cluster variation came from a workshop conducted about ten years ago with a staff of teachers in a large high school (Burke, 2009). The challenge posed in the workshop was to design a high school of the future that would enhance both learning and teaching experiences. Within a few hours participants had already broken down a large high school of 1000 students with 75 staff into groups of 170 students with 10 teachers housed in 6 classrooms functioning as learning ‘hubs’.



©nEdworks/LEARN 2017

The beauty of this construct lies in its convergent simplicity and the tremendous energy and versatility that it brings to the design of adaptable learning experiences. The immediate advantages seem obvious. Even in traditional classroom groupings, at any one time four of these teachers are not ‘teaching’, but available for curriculum mapping, planning, or individualized instruction – further professionalizing the teachers’ practice. The model also enables increased flexibility through a complement of 10 teachers, included 6 subject specialists, an Arts coach, 2 resource teachers (an unprecedented ratio), and a master teacher as the pedagogical leader of the group.

The key to this transition lies in the establishment of interdisciplinary teams of teachers to collaboratively design and facilitate learning, rather than the abolition of subject specialists. This mirrors the interrelational structures of most organizations, whereby complementary specialists are deployed in collaborative teams applying the principle of ‘team learning’ (Senge, 2012). In this scenario both teachers and students are able to escape the scheduling grind and autonomously manage time-on-task, ensuring personalized learning for all students. Students in such settings experience a heightened sense of belonging and collegiality that is impossible in the current random assignment to discipline-based classes (Robinson, 2015). This core structure in itself shows great potential in redressing the inhibitors of matter, space, and time identified earlier in this report.

CONCLUSIONS

Toward a Systems-thinking Solution

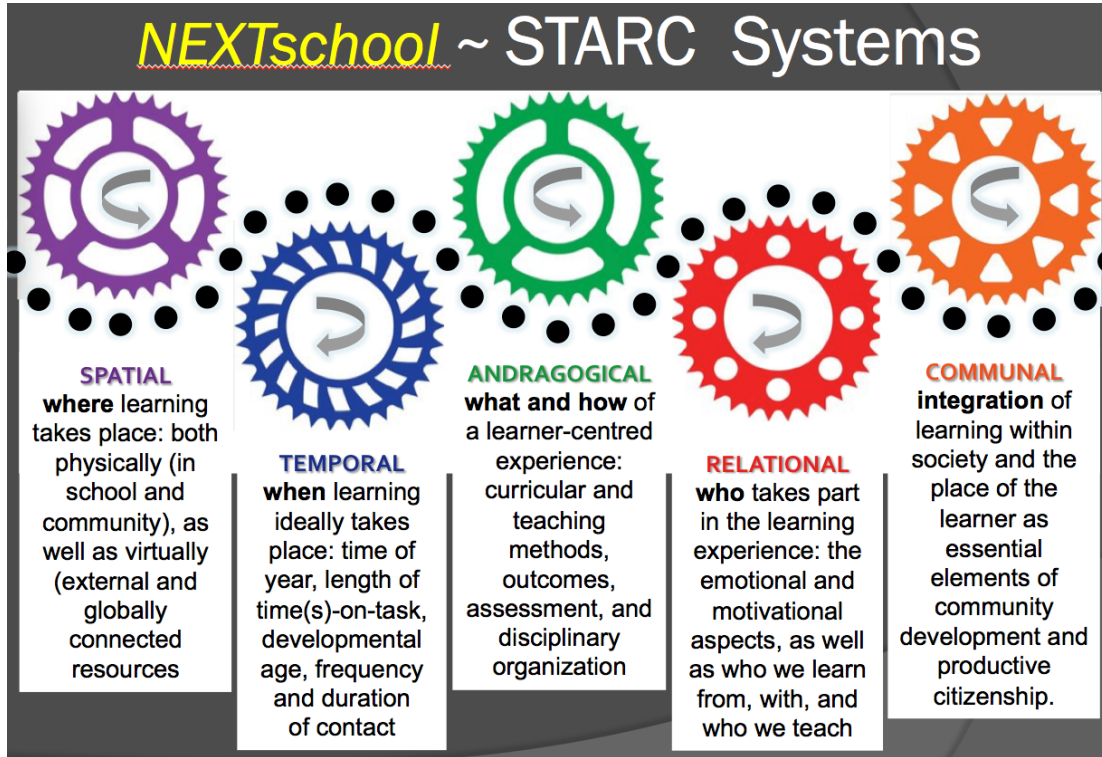
The convergence of our findings and prior assumptions uncovers the need to elaborate the conditions under which such ‘schools-within-schools’ could operate. Not only would it be necessary to modify many of the active systems within the conventional high school; but gives rise to the responsibility of continually adapting practice to the wide range of learning experiences that would naturally evolve within a collaborative cluster of teachers and learners. Coincidentally, a week was spent with members of the MIT Learning Lab in Boston. The seminars were conducted under the guidance of Peter Senge, creator of the concept of the ‘Fifth Discipline’ (2006) in the corporate world, and lead author of the monumental work, ‘Schools That Learn’ (2012). Senge’s work resulted in the conception of the notion of ‘organizational learning’, a model that is the precursor of the popular Professional Learning Community (PLC) movement. The Fifth Discipline, ‘Systems Thinking’, follows Personal Mastery, Shared Vision, Mental Models, and Team Learning. Senge’s mapping of formal school relationships led us to three conclusions: Systems thinking reveals the complexity of the relationships that co-exist in the structure of school. It also delineates the established and artificial boundaries of classroom, school, and community; and their frequent disruption by various stakeholders. Thirdly, it underscores that most basic of systems principles; that a change to any single element results in a direct impact on all of the other elements within the system. (Senge, 2006). These dynamics inspired us to think differently about how to map out a path through this complex theory of change. The articulation of systems thinking, particularly the interdependence of systems, took us on a divergent path that inspired us to create a platform for identifying and situating the many elements that would compose any changes in structure and culture.

As stated earlier, our initial concern was not the absence of innovative teaching practices; but the ability to embed these practices in the structure and culture of the school, and be able render them scalable and sustainable. Systems thinking enabled us to clarify the root cause of this problem as a persistent focus on a singular strategic sub-system – teaching methods. In most of the cases that we observed, these practices survive as standalone innovations which survive despite the insufficient support of surrounding structures, processes, and policies. Once we employed the tenets of systems thinking, we exposed divergent barriers that generate a cumulative negative impact on innovative efforts if they are not acknowledged and addressed in the change process. In other words, the discovery is that - what systems perhaps do best, when not monitored and mastered, is to perpetuate themselves (Meadows, 2008).

In an attempt to organize our thinking about the necessary conditions for successful innovation, we have developed a prototypical model composed of five interdependent sub-systems that characterize and embody the complexity of the teaching-learning environment and by extension, the school. The ‘STARC’ systems model we have developed is an early blueprint for the *NEXTschool* framework, and is expected to accommodate the interdependence of these five sub-systems and the symbiotic relationship with other systems that co-exist within and without the school boundaries.

Collectively these sub-systems serve to rationalize formal and informal learning settings; the synchronization of time with the needs of the learner; adaptive approaches that enable student-centered learning; collaboration with others in the learning process; and the interdependence of the learner with the community.

A simplification of the STARC interdependent systems model is shown in this chart:



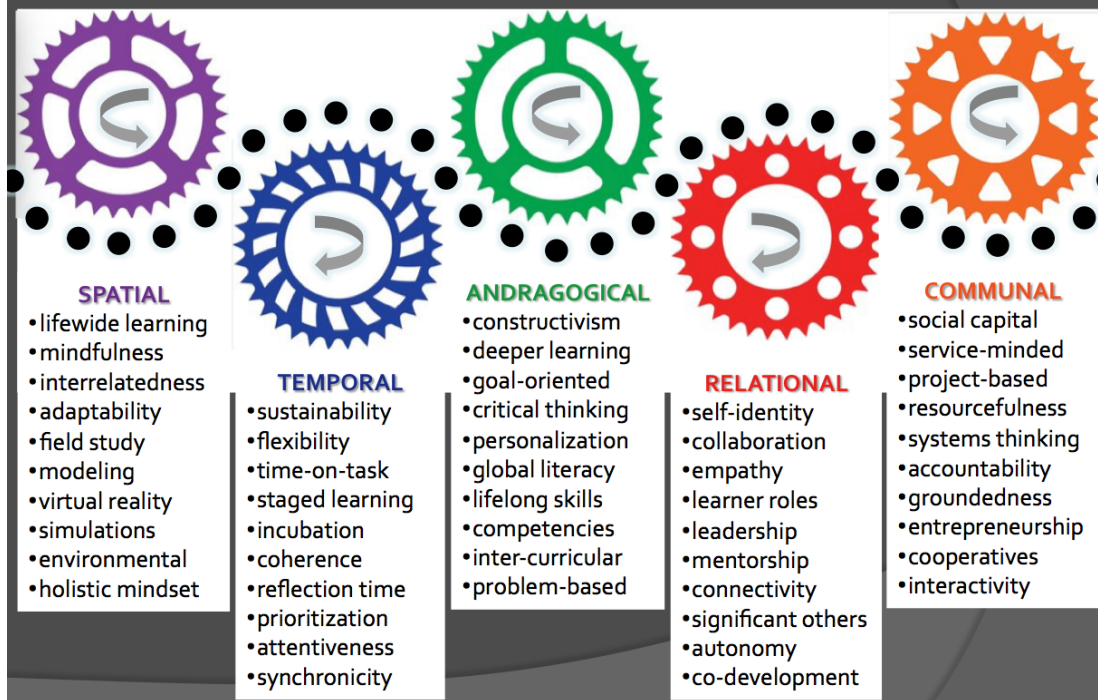
© nEDworks/LEARN 2017

It should be noted that our findings and conclusions at this point are observational, and will be subject to the rigors of the projects proposed design phase.

Systems Drivers

From this point we proceeded to diverge once again and distinguish, within each of these five systems, the drivers and expectations that are generated both internally and externally resulting in a continuously evolving mandate for the classroom and school. This in turn will necessitate a set of processes and conditions; beginning with a comprehensive design process that will accommodate a broad range of stakeholder interests. The chart below illustrates the design challenge going forward, which is to develop a framework around these five systems, one that will be responsive to the expectations expressed throughout this report. We have identified these drivers in the following table as they relate to each of the five STARC systems.

STARC Systemic Drivers



© nEDworks/LEARN 2017

As the Research and Development Phase progressed, we established an Exploration Guidance Group (EGG) to provide advice on and validation of the research activities. This is a group of twenty people, selected as a broad representation of educational stakeholders (*see Appendix 'B'*) including student, teacher, parent, and administrator; as well as municipal, community, and corporate representatives. One of our activities was to solicit from the EGG a list of “must haves” for the future high school. Following are the results of this informal survey:

- Professional development tailored to the needs of the teachers
- Evidence of a culture of innovation and risk-taking
- Balanced curriculum
- Place for the Arts and Physical Education
- Need to incorporate a variety of delivery modes into the learning paths
- Participatory environment
- Consideration has to be given to the physical learning spaces
- Uncertainty as it relates to the future must be a driving consideration
- Flexible de-centralized scheduling
- Competency-based curriculum and incorporate cross curricular learning
- Pedagogical flexibility
- Differentiation and education for all
- Development of CCC skills
- Highlight Creativity
- Student-oriented
- Inquiry driven

- Learning must be personalized
- Evaluation– formative focus and flexible competency demonstration
- Growth Mindset in School Leadership
- Room for empathy
- SHTEAM / Humanities
- Incorporate independent learning
- Strive for intrinsic motivation
- Metacognitive skill development
- Program to develop personal, emotional and social skills
- Professional learning community created as a grassroots teacher driven activity
- Appropriate structure for the school and required support
- Principal-teacher relationship grounded in equity partnership approach
- Connected to the real world and generative in nature
- Consistently evolving
- Have an entrepreneurial component integrated
- Open architecture
- Community integration essential
- Should have an experiential learning component
- Environmental/sustainability component

A Day in the Life...

In the interest of rendering the vision of *NEXTschool* more realistic, we offer a ‘day-in-the-life’ scenario that should provide a concrete sense of what student life is like in a highly innovative ‘future-ready’ high school environment. The group that studied and recorded the qualitative student experiences share the power of storytelling in organizational culture. To wit;

“These narratives are used to bring together and test change processes, education scenarios, and stakeholder interactions. Education scenarios and day-in-the-life narratives, used together, are powerful tools for checking that the vision and direction of the school will deliver a final structure that is consistent with the needs of learners and the educational goals of the community.”

(G&D Associates, 2013).

Following is the scenario of a typical day for a 14-year old student abstracted from a District 11 high school in Colorado.

SCENARIO

Scott and his teammates are working on a project with the Cheyenne Mt. Zoo to help create a new aquarium. They are collaborating with the Boston Aquarium, Toronto Zoo, and The Deep (Hull UK).

> EARLY MORNING

Scott is up early. He accesses his calendar and puts in his lunch order, at the same time he books a working space as he will be running an external guest session and the only time his guest (Dr. Wilborn) is available is around lunchtime. Scott has flexibility over his work time but as he is collaborating with a larger group and a guest he decided a working lunch would be the most effective. Scott had considered a live video chat with Dr. Wilborn but having worked with him for the past month he knew that this was not the best means of communication for him, plus, he thought that he might as well take advantage of him being local.

After booking lunch and space, Scott emails Dr. Wilborn a meeting request and a link to the appropriate Google Street View to ensure he gets the correct building as he knows from experience that his building can be hard to find. Finally Scott sends Dr. Wilborn an electronic pass to his building in the form of a secure QR code, this will enable him to register on entry and gain access to their meeting room.

Having finished organizing his meeting, Scott has breakfast and reads what is rapidly becoming his favorite novel, *The Hunger Games*. He has an iPad version of it but much prefers a paper book when he is reading for pleasure.

> MORNING

Scott gets dressed and heads out to meet his teammates and teacher at the zoo. The student team is meeting with zoo personnel for a planning meeting. The director (Ben Fiddens) has asked the group to walk his team through their ideas for making the displays surrounding the aquarium interactive. The group have put together a short animation showing their ideas for interactive aquarium displays and coupled this with video footage of a horseshoe crab environment at the Boston Aquarium that allow visitors to handle the crabs in the presence of their keeper.

After seeing the group's work Ben asks Scott and the team to expand on the ideas in the animations and develop them into a proposal, the format of which is open but it must take into account the needs of the zoo's board and the fact that some of them are not comfortable using technology.

The Team leaves and heads to a local coffee shop with their teacher to summarize the meeting, through collaborative cloud based documents they are able to input their thoughts as they are discussed and plan out their next steps. After much debate the team cannot agree upon suitable formats for the proposal so they decide to continue the discussion by Skype later that afternoon. As the team's lunchtime meeting is getting close, they jump in the minibus and head back to school, just in time to see Dr. Wilborn walking into the wrong building! Their teacher has a different meeting and tells them that she will be back after lunch.

> LUNCH

Scott and Robert (his friend from the team) head to the lunch room to pick up the sandwiches for the meeting; this includes Dr. Wilborn's vegan meal that he was able to order through an online menu Scott had sent him.

The team meets with Dr. Wilborn (who has now found the correct building) in a 'flex room' - the school has a number of these rooms (about 50% of the school is designed in this way). The flex room contains a standard technology kit that includes interactive display both wall and table mounted and high quality sound. Each ex room has furniture that can be arranged in different ways to create more effective working

environments. The furniture differs room to room so they are booked based on a group's needs.

This is easier than it sounds due to the fact that booking is online and the system will suggest a room based on your requirements i.e. number of people and type of activity. Dr. Wilborn is an expert in marine wildlife and the team has asked him to come in and help them develop a shortlist of possible species for the aquarium. They had originally tried to do this meeting by video-conference but had decided that face to face was a more effective solution. The team briefs Dr. Wilborn on their progress so far, which includes showing him mock-ups of three different aquarium designs on the display table. After much discussion the team settles on a shortlist that they will share with Ben before their next visit. Knowing that Ben likes to be aware of how decisions were reached, the team have videoed the discussion session and will send him a link to it.

> AFTERNOON

Scott heads to the auditorium for a large group live video presentation from an author based in New York. As Scott walks into the auditorium he is automatically logged in, the purposes of the auto login is to provide Scott with differentiated activities developed around the author's presentation and also give him access to the "back channel". After the presentation, Scott heads to his literacy class. Although literacy is not his strong point, he really enjoys the lessons because they are highly personalized both in terms of delivery and environment.

Today he is working with two other students to produce "marketing copy" for his aquarium project. After completing this work Scott revisits the video from the author's presentation and then chooses one of five menu options for applying his learning. Some students in the room choose to work together around tables while others are sitting on the floor working individually. The teacher is available to answer questions, guide and motivate. There is no designated teacher space in the room.

> AFTER SCHOOL

When his literacy session is over Scott heads to the gym for a workout that is guided by his personalized workout plan accessed via his phone. After his workout he heads home.

Before dinner Scott Skypes the members of the aquarium team as arranged to finalize the format for the zoo board proposal. They eventually agree on an electronic format using ISSUU because it has the look and feel of a book or magazine with the advantages of electronic storage and delivery. They also decide to print out copies for those uncomfortable with the technology.

After dinner with his family Scott logs into his personalized Math simulation from 10pm to 10:30pm. He spends 15 minutes watching the Math direct instruction video from his teacher. This is guided by tomorrow's schedule, which includes his math assistance class.

Finally Scott checks his calendar that shows his schedule for tomorrow. This includes a creativity session, team project collaboration, and?

(G&D Associates, 2013)

Summary Conclusions

The adoption of a systems-thinking approach to the transformation of high school brings us to the limits of the research and development phase of this project. Any further elaboration would take us into a discussion that must necessarily engage a broader and larger representation of stakeholders than we have employed so far. We are currently hosting a Learning Lab of 35 graduate students at McGill University who will be generating a series of literature reviews and position papers as a foundation for the design work in the next phase of the project. The design challenge going forward will be to explore and develop a viable framework that can ensure successful piloting of a range of *NEXTschool* applications with the goal of a sustainable and scalable transformation of the high school experience in Québec. Overall then, our conclusions from the Research and Development phase are as follows:

- The current organization of the high school is out of step with the expectations of student learning, growth, and survival in the 21st Century.
- The notion of school as the central repository and exclusive mode of delivery for information and knowledge is no longer viable in an Internet world.
- The global imperative for the transformation of high school structures is driven by the rapidly accelerating rate of change in its outer environment.
- Students are keenly aware of the world around them, the challenges it faces, and their need to be fully engaged and prepared for citizenship within it.
- Adaptability is the universal skill for the 21st Century; and applies to both the learner's skillset and the continuous reorganization of the school experience.
- Myriad successful educational innovations suffer from an absence of cultural and structural supports that would render them sustainable and scalable.
- Many of the conventional structures, practices, and policies that dictate school organization are artificially established and only assumed to be compulsory.
- The QEP design ranks among 'Top 5' curricula worldwide by incorporating socio-constructivism, competency-based learning, and generic life skills.
- 'Higher Order Thinking, 'Personalized Learning' and 'Project-based Learning' constitute the emerging pedagogies of the high school of the future.
- Sustainable and scalable innovation, particularly for high school, is wholly dependent on a systems-thinking approach to organizational transformation
- The establishment of 'clusters' or 'schools-within-schools' is essential to ensuring the flexible and autonomous organization of learning experiences.
- The central premise of *NEXTschool* is the decentralization of the control and management of the teaching-learning experience to the teacher and learner.
- The assumptions and principles of the *NEXTschool* project have been validated, supported, and are part and parcel of a global change movement.
- *NEXTschool* is feasible within the Québec curriculum, the Collective Agreements, the Basic School Regulations, and the Québec Education Act.
- The ideal criteria for the framework design and subsequent applications of a *NEXTschool* should be the '7 Principles of Learning' established by the OECD
- The greatest challenge to *NEXTschool* implementation will be the 'culture-shift' necessitated by the scope and scale of the proposed transformation.

RECOMMENDATIONS

Following are the recommendations for the next phase of the *NEXTschool* initiative, endorsed by the Exploration Guidance Group, which was established to provide expertise and advice on the Research and Development phase of the *NEXTschool* project:

1. That the *NEXTschool* project be approved to continue with a second ‘Design Phase’, and given a mandate to develop a workable framework for the piloting of *NEXTschool* applications in a variety of settings.
2. That a ‘Design Group’ be established and include a broad spectrum of stakeholders – with particular attention paid to the input and expectations of the Learner-Teacher-Parent triad and broader community engagement.
3. That a ‘Design Lab’ be initiated to function as an incubator of ideas and a producer of models and prototypes for various *NEXTschool* applications.
4. That a Vision-making event be held early next year to validate a report from the Design Group that would be delivered in April, 2018.
5. That a *NEXTschool* ‘Summer Institute’ be held in July 2018 for all interested parties – to be hosted by our university partners.
6. That 2018-19 be considered as a ‘Preparation Year’ for schools that might pilot *NEXTschool* beginning in September 2019.

Epilogue...

In considering the potential of the *NEXTschool* initiative we should be mindful that this concept is not new. Innovative thinkers such as John Dewey (1922) and Ivan Illich (1970) have been advocating this kind of change for nearly one hundred years. This urgent call to action is echoed in the conclusion of the Estates General (1996) of Québec Education, which inspired the QEP, that; “... *Schools must break with traditional views of schooling, existing educational structures, the current division of responsibilities, and certain acquired privileges.*” More recently, the Conseil Supérieur (2009) concluded in its seminal report on secondary education that; “... *to realize the potential of the QEP requires the removal of systemic barriers that can hinder its implementation.*”

The key advantage for Québec educators in 2017 is our sectors ‘readiness’ for this transformation, given our firm belief that all the essential elements are in place and primed for activation. The challenge proposed by *NEXTschool* is to seize this unique opportunity, and act now to establish our rightful place as a world-class leader in high school education for the future.

APPENDIX 'A'

CHRONOLOGY OF *NEXTschool* R&D Activities

DATE	ACTIVITY	OBJECTIVE	CONTACT
160929	Working Session	R&D Strategy planning	Michael Canuel
161026	Meeting	University Partnerships	Lynn Butler-Kisber
161103	Conference/Interview	Systems Thinking Approach	Peter Senge
161202	Working Session	Human Systems Approach	Don deGuerre
161203	Interviews	Systems & Clustering	MIT Learning Lab
161202	Teleconference	Next High School Application	Zak Eckenerry
161208	Presentation	R&D Overview	LEARN Board
170113	Presentation	Project Overview	DEEN
171210	Compilation	Innovation Literature	CERI / OECD
170114	Presentation	Project Overview	EPCA
170118	Presentation	Project Overview	NFSB
170119	School Visit	Deeper Learning / LMS	Ottawa Catholic SB
170127	Working Session	University Partnerships	Concordia
170130	Presentation	Project Overview	MEES/DSCA
170202	Webinar	Design Thinking	ASCD
170309	Partnership	Professional Development	Lise Palmer
170317	Teleconference	Finnish Innovation	Pasi Sahlberg
170323	Conference	Flex-time & Clusters	NSBA
170327	School Visit (D-11)	Personalized Learning	Scott Fuller
170401	Conference/Meeting	Deeper Learning	Michael Fullan
170516	Presentation/Feedback	Project Overview	Student Group
170521	Establishment	Exploration Guidance Group	Michael Canuel
170530	Meeting #1	Exploration Guidance Group	Members
170601	Working Session	Design Process Strategy	Don deGuerre
170602	Teleconference	School Clustering	Steven Edwards
170609	Teleconference	Student Centredness	Alan November
170616	Presentation	Project Overview	QPAT
170620	Meeting #2	Exploration Guidance Group	Members
170629	Meeting	Project Overview	David Birnbaum
170706	Meeting	Concordia Partnerships	Alan Shepard
170721	Meeting	New Zealand Model	Luke Sumitch
170723	Conference/Interview	Future Speaker Selections	Alan November
170724	Meeting	Problem-based Learning	Michael Gorman
170724	Meeting	Personalized Learning	Donna Teuber
170810	Working Session	Design Process Design	Don deGuerre
170725	Meeting	Personalized Learning	Daren Kurapatwa
170823	Presentation	Design Lab Partnership	Robert Cassidy/CTL
170901	Working Session	Learning Lab Initiation	Lisa Starr/McGill
170905	Learning Lab	Validation of R&D Work	35 Graduate Students
170906	Teleconference	Town Hall Exploration	Shawn Apel - CBC
170913	Working Session	Research Partnership	Steve Jordan/McGill
170920	Meeting #3	EGG – Report Feedback	Members
170926	Presentation	Project Overview	Kate LeMaistre/ABEE

APPENDIX 'B' EXPLORATION GUIDANCE GROUP (EGG)

DELEGATE	NAME	SOURCE	EXPERTISE
<i>NEXTschool</i>	Noel Burke	nEDworks	Project Design
LEARN	Michael Canuel	LEARN	Project Implementation
Ed. Ministry	Elaine Roy	MEES / SSCA	Policy & Program
Commissioner	Dan Lamoureux	QESBA	Public & Policy
Directors General	Tom Rhymes	ADGESBQ	School Leadership
Educational	Deborah Foltin	CS Littoral SB	Curriculum Leadership
Service Directors	Mike Helm	New Frontiers SB	
Consultant	Sam Bruzzese	Independent	Info. Technology
Principal	Francois Leblanc	ADGESBQ	School Leadership
Teacher	TBA	QPAT (TBC)	Collective Agreement
Parent	Rhonda Boucher / Debie Germann	EPCA	System Accountability
Student	Sabrina Sorger	S.W.-Laurier SB	System Beneficiary
Community	Gabriel Bran Lopez / Helene Moise	Fusion Jeunesses	Youth Engagement
Community	Dennis Smith	City of Pte. Claire	Civic Engagement
Corporate	Avery Rueb	EDTEC	Labour Market
Academic	Don DeGuerre	Concordia	Human Systems
Academic	Lynn Butler-Kisber	McGill	Qualitative Research
Academic	Robert Cassidy	Concordia/CTL	Learning Spaces

APPENDIX 'C'

REFERENCES

- Anderson, L. W., Krathwohl, D. R., & Bloom, B. S. (2001) *A Revision of Bloom's Taxonomy of Educational Objectives*, New York: Longman.
- Barnard, Peter A. (2013) *The Systems Thinking School: Redesigning Schools from the Inside-Out*, Lanham, ML: Rowman and Littlefield.
- Bender, William N. (2012) *Project-Based Learning: Differentiating Instruction for the 21st Century*, Thousand Oakes, CA: Corwin Press.
- Bitter, Catherine, and Loney, Emily (2015) *Deeper Learning: Improving Student Outcomes for College, Career, and Civic Life*, Washington: Educational Policy Center at American Institutes for Research.
- Booth, Ian, and Dunn, Judith F. (2013) *Family-School Links: How Do They Affect Educational Outcomes?* Abington, UK: Routledge.
- Burke, N.C. (2009) *High School From Inside the Box*, Montreal Gazette, OpEd (Feb. 18)
- Clarke, John, H. (2013) *Personalized Learning: Student-Designed Pathways to High School Graduation*, Thousand Oakes, CA: Corwin Press.
- Conseil Supérieur de l'Éducation (2009) *A secondary School Adapted to the Needs of Youth in Supporting Their Success*, Québec: Éditeur officiel du Québec.
- Deweese, S. (1999) *The School Within School Movement*,. Charleston WV: ERIC Clearinghouse on Rural Education and Small Schools,
- Dewey, J. (1922). *Democracy and education: An introduction to the philosophy of education*, New York: Macmillan.
- Duffy, Francis M. (2008) in Reigeluth, Charles M., Ed., *Future Minds: Transforming America's School System*. *Educational Technology*, v48 n3 p45-49.
- Dumont, H., Istance, D, and Benavides, Eds. (2010) *The Nature of Learning: Using Research to Inspire Practice*, Paris: OECD Publishing, Centre for Educational Research and Innovation (CERI).
- Duncan, Arne (2016) *The Myth of the 'Miracle School'*, in Whitmire, R. *The Founders: Inside the Revolution to Invent and Reinvent America's Best Charter Schools*, Chicago: The 74 Media Group.

Economist, The. Intelligence Unit. (2017) *Worldwide Educating for the Future Index: A Benchmark for the Skills of Tomorrow*, New York:
<https://dkf1ato8y5dsg.cloudfront.net/uploads/5/80/eiu-yidan-prize-educating-for-the-future-wp-final.pdf>.

Estates General on Education (1996) *The State of Education in Québec*, Québec: Commission des États généraux sur l'éducation
<http://collections.banq.qc.ca/ark:/52327/bs40857>

Fadel, C., Bialik, Maya, and Trilling B. (2015) *Four-Dimensional Education*; Boston: Center for Curriculum Design.

Friedman, T.L., and Mandelbaum M. (2011), *That Used to Be Us*, New York: Farrar, Strauss, Giroux.

Fullan, M. (2003) *The moral imperative of school leadership*. Toronto: Ontario Principals' Council.

Fullan, M., Quinn, J., and McEachen, J. (2017) *Deep Learning: Engage the World Change the World*, Thousand Oakes, CA: Corwin Press. (publication – Nov. 2017)

G&D Associates (2013). *A Day in the Life of a 14yr Old Student in District 11 – Scott Gregson*, Colorado Springs: District 11 School Board.

Grams, Chris, (2013) *The 12 Enemies of Adaptability*
<http://www.mixhackathon.org/hackathon/contribution/12-enemies-organizational-adaptability>

Hood, David (2015) *The Rhetoric and the Reality, New Zealand Schools and Schooling in the 21st Century*, Masterton, NZ: Fraser Books.

Illich, Ivan (1970) *Deschooling Society*, New York: Harper Books.

Isaacson, W. (2007) *Einstein, His Life and Universe*, New York: Simon & Shuster.

Larmer, J, Mergendoller, J., Boss, S. (2015) *Setting the Standard for Project Based Learning: A Proven Approach to Rigorous Classroom Instruction*, Alexandria, VA, ASCD Publishing.

Meadows, D. H. (2008). *Thinking in Systems: A Primer*, White River Junction, VT: Chelsea Green Publishing.

MEES (2014) Ministère de l'Éducation du loisir et du sport *Indicateurs de l'éducation*, Québec: Éditeur officiel du Québec.

MEES (2016) Ministère de l'Éducation du loisir et du sport *Basic School Regulations*, Québec: Éditeur officiel du Québec.

MEES (2017) Ministère de l'Éducation du loisir et du sport *Let's Talk About the Future: Toward a Policy on Educational Success*,
http://www.education.gouv.qc.ca/fileadmin/site_web/documents/autres/bureau_sm/pol_reussite_doccomplet_15sept_EN.pdf

MELS (2004)) Ministère de l'Éducation du loisir et du sport *The Québec Education Program: a Curriculum for the 21st Century*,
http://www.education.gouv.qc.ca/fileadmin/site_web/documents/PFEQ/chapter1.pdf

Millenium Project (2017), *The Fifteen Global Challenges*, Brussels: United Nations Publications. <http://www.millennium-project.org/challenges/>

Moran, Robert T., and Harris, P.R. (1982) *Managing Cultural Synergy*, Houston: Gulf Publishing.

November, Alan (2012) *Who Owns the Learning? Preparing Students for Success in the Digital Age*, Bloomington, IN: Solution Tree Press.

OECD (2013) *Innovative Learning Environments*, Centre Educational Research and Innovation, Paris: OECD Publishing.

OECD (2015) *Schooling Redesigned, Towards Innovative Learning Systems*, Centre for Educational Research and Innovation, Paris: OECD Publishing.

OECD (2017), *Education at a Glance 2017: OECD Indicators*, Paris: OECD Publishing. <http://dx.doi.org/10.1787/eag-2017-en>

Pearlman, Bob (2002) Reinventing the High School Experience; *Educational Leadership*, Volume 59, Number 7.

Pelligrino, J. (2012) *Education for Life and Work: Developing Transferable Knowledge and Skills for the 21st Century*, Washington, DC: The National Academies Press. <http://doi.org/10.17226/13398>

PISA (2003) *Problem Solving for Tomorrow's World: First Measures of Cross-Curricular Competencies*, Paris: OECD Publishing.

Prince, K. & Swanson, J. (2016) *Shaping the Future of Learning – A Strategy Guide*, Cincinnati, OH: Knowledge Works Foundation.
<http://www.knowledgeworks.org/shaping-future-learning-strategy-guide>

Project Tomorrow (2011) *Speak Up: Going to school in 2015: How Students Envision the Future!* Irvine, CA. <http://www.tomorrow.org>

Rainie, L. (2016) *Education in the Age of Fake News and Disputed Facts*, Washington, DC: Pew Research Center.

Ritchhart, R. (2015) *Creating Cultures of Thinking: The 8 Forces Me Must master to Truly Transform our Schools*, San Francisco, CA: Jossey-Bass.

Robinson, K. (2015) *Creative Schools, The Grassroots Revolution That's Transforming Education*, New York: Penguin.

Senge, P. M. (2006) *The Fifth Discipline (2nd Ed.): The Art and Practice of the Learning Organization*, New York: Doubleday/Currency.

Senge, P. M. (2012) *Schools That Learn: A Fifth Discipline Fieldbook for Educators, Parents, and Everyone Who Cares About Education*, New York: Doubleday.

Tyack, D. B., & Cuban, L. (1995) *Tinkering Toward Utopia: A Century of Public School Reform*, Cambridge, MA: Harvard University Press.

NOTE: Additional Resources

Below is a web link to the (152) downloadable articles and their abstracts that we have sourced from the OECD/CERI research on Innovative Learning Environments. These have been regrouped within the following categories for ease of access:

- Learning Environments (8)
- Cognitive Science (5)
- Learning Theory (10)
- Student Motivation (5)
- Biology & Neuroscience (7)
- Formative Assessment (13)
- Inquiry-based Learning (26)
- Innovation Implementation (20)
- Community as Resource (23)
- Family Effects on Learning (35)

<https://www.dropbox.com/s/y76jv9fz2dr7014/NEXTschool%20Article%20Abstracts%20copy.docx?dl=0>



NEXTschool

**STUDENT-CENTERED, TEACHER-DRIVEN,
GLOBALLY-CONNECTED, COMMUNITY ENGAGEMENT**