How a Network of Microlabs Might Lead Us to the Next Generation of Learning

An Innovation Strategy for K-12 Education by Dave Lash   15 February 2010

> "Economists may continue to measure labor productivity as if the entire world of work could be represented adequately by the assembly line, but their measures will be systematically indifferent to what is most valuable in the informated organization. A new division of learning requires another vocabulary — one of colleagues and co-learners, of exploration, experimentation, and innovation."
>
> Shoshana Zuboff
> *In The Age of the Smart Machine*

Will computer learning rescue our schools? Vouchers…or charters? Merit pay for teachers?

The remedies currently on the table seem inadequate to the challenge. A perfect storm of sorts looms over the state of public education as the persistent inability to adequately educate all American children is now exacerbated by a gigantic fiscal crisis and growing awareness that "21st century skills" could not be further from our current reality.

The key question we are all wrestling with is: **What system of innovation will produce effective, substantive changes in practice that can be scaled quickly?** To that end, I would like to propose for consideration a network of microlabs housed in existing schools that might:

1. Pioneer the conversion from time-based to mastery-based learning architecture;

2. Power that conversion with a network of local teacher-innovators supported by a "national lab"; and

3. Foster a natural migration of traditional schools to the next generation of learning.

Dave Lash is a facilitator and consultant specializing in strategy and innovation. He is a co-author of *The Turnaround Challenge*, the influential 2007 research report that presents a new framework for turning around failing schools. Over 175,000 copies of the report have been downloaded. Dave works at the nexus of learning, technology, and product/process design, including work for United Technologies, MIT, Massachusetts General Hospital, and the Kauffman Foundation. From 1991 to 2003, he played a key role in establishing a new Massachusetts independent school serving students from years 3 to 15 in multi-age classrooms.

The microlab scenario described in this paper builds on our research on high-performing, high-poverty (HPHP) schools summarized in *The Turnaround Challenge*. Faced with student populations of widely varying backgrounds and readiness to learn, and constrained by an assembly-line education architecture designed on the myth of student homogeneity, these heroic HPHP teachers and principals do everything in their power to reassign and reconfigure resources to ensure that every student is actually learning.

That HPHP research galvanized my belief that incremental improvement to the current system perpetuates fatal flaws — in both high-poverty and high-income schools — that cannot be overcome without significant system redesign. Accordingly, as I participate in education innovation initiatives and discussions, my focus is on "what" system change is needed and "how" can we achieve it, particularly when the existing dominant design[1] has proven so resistant to change for so long. Fortunately, we have a substantial body of research we can apply on "how breakthroughs happen" with respect to innovation and its diffusion in the face of mature systems.

Given this context, I believe our best chance for success is an innovation strategy for transforming education built on three core ideas:

1. That the single most important cornerstone for the next generation of learning is to create multi-age learning communities that model and motivate personalized learning;

2. That the single most important ingredient in education innovation is a robust cohort of passionate and persistent teacher-innovators; and

3. That the fastest avenue to changing the education system is to establish, incubate, and expand a new model within existing schools.

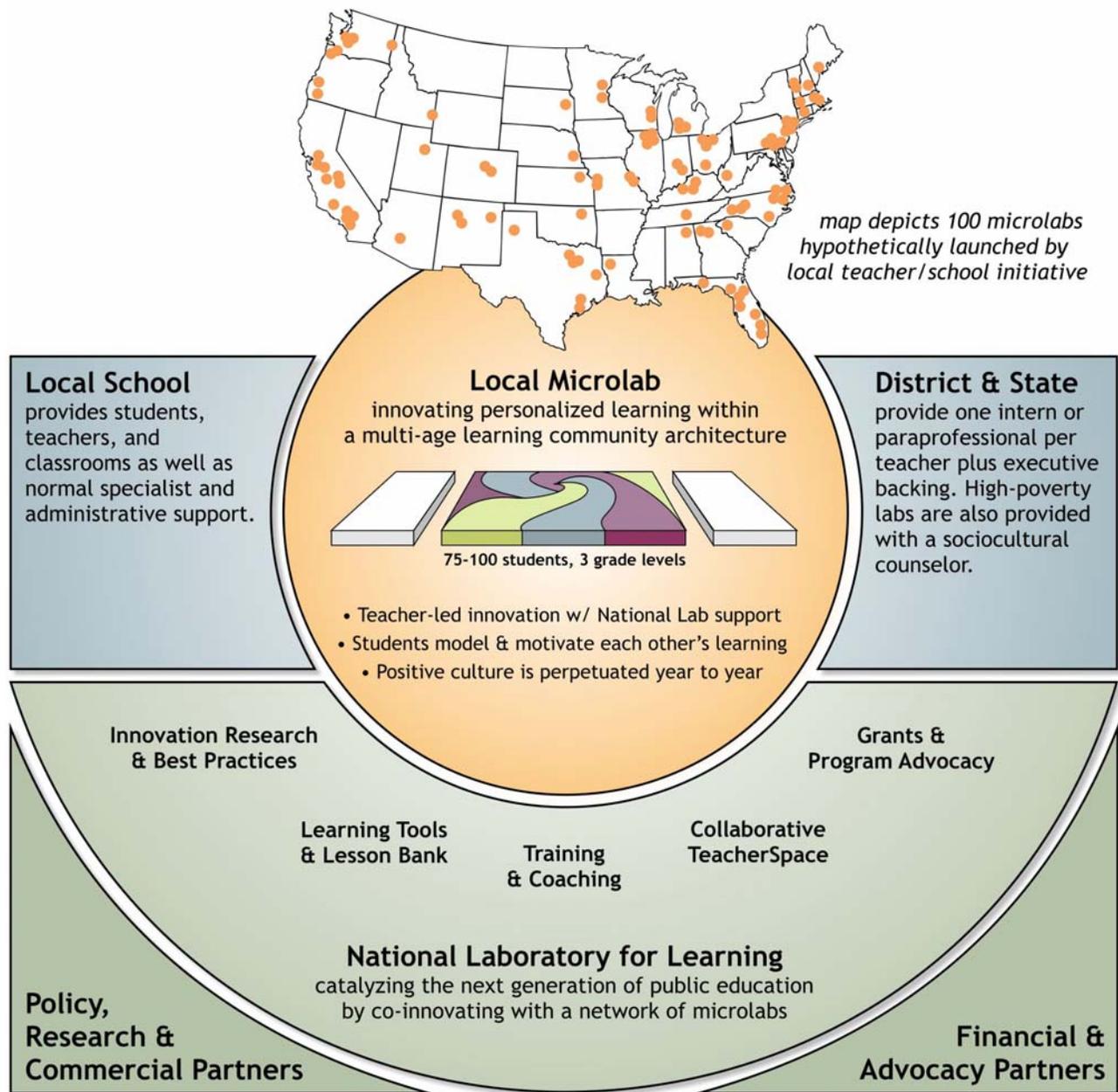I will discuss these assertions below, following a description of the proposed initiative.

How might the microlab system work?

1. An alliance of education advocates creates a National Laboratory for Learning to develop the next generation of learning through co-innovating with local microlabs.

2. Each microlab is a small, local unit of innovation focused on transforming a cluster of three or four time-based, age-graded elementary classrooms into a multi-aged learning community.

3. Any group of three (or four) teachers of consecutive grade levels can apply as a team to become a microlab. Example: a team comprised of a first, second, and third grade teacher.

4. Microlabs are opt-in ventures: the application must be endorsed by the school, district, and state; only those students and parents wishing to participate will be in the program.

---

[1] James Utterback, in *Mastering the Dynamics of Innovation,* describes how industries often evolve towards a set of conventions that inhibit or lock out alternative approaches, as in K-12 and many other fields. In such cases, innovations must find ways to survive and co-exist until they develop the traction to gain a competitive foothold. The resiliency of the dominant model in K-12 is nicely described in *Disrupting Class* by Christensen, Horn, and Johnson, p33.

How a Network of Microlabs Might Lead Us to the Next Generation of Learning

map depicts 100 microlabs hypothetically launched by local teacher/school initiative

Local School
provides students, teachers, and classrooms as well as normal specialist and administrative support.

Local Microlab
innovating personalized learning within a multi-age learning community architecture

75-100 students, 3 grade levels

- Teacher-led innovation w/ National Lab support
- Students model & motivate each other's learning
- Positive culture is perpetuated year to year

District & State
provide one intern or paraprofessional per teacher plus executive backing. High-poverty labs are also provided with a sociocultural counselor.

Innovation Research & Best Practices

Grants & Program Advocacy

Learning Tools & Lesson Bank

Training & Coaching

Collaborative TeacherSpace

National Laboratory for Learning
catalyzing the next generation of public education by co-innovating with a network of microlabs

Policy, Research & Commercial Partners

**Financial & Advocacy Partners**

© 2010 Dave Lash & Company

5. If accepted by the National Lab into the program, each microlab is a partnership of the school, its state/district, and the National Lab.

6. Each microlab receives three years of funding, training, and research support from the National Lab which also facilitates and supports online and face-to-face collaboration between all microlab teachers and district personnel.

7. The school contributes three (or four) classrooms — perhaps 75 to 100 multi-aged students — plus the teachers and specialist support normally allocated to that number of students.

8. The state and district provide advocacy and political support for the microlab, plus three intern or teaching assistant positions. High-poverty labs would also receive a "Readiness to Learn" staffer who would serve what the Brits call "pastoral education" needs including liaison and resource coordination with social service agencies and community resources. (Funds for some of the state/district expenses might be shared with the National Lab.)

9. The National Lab provides the research and training (including both a summer and in-year training institute), a networked "TeacherSpace" infrastructure for peer learning, learning tools and a lesson bank, and a three-year grant. Microlabs could continue as members of the National Lab network beyond the first three years, but without the guarantee of further grant funding.

As described, the microlab initiative would focus on early and elementary grades to give each child a solid foundation for future learning. Many of the principles I am about to describe could be applied with modification to middle school and high school as well.

Why should multi-age learning communities be the first cornerstone in creating the next generation of learning?

Multi-age learning communities comprised of 50 to 150 students[2] are a powerful tool for driving mastery-based learning. There are five reasons they should be at the heart of system redesign: 1) generating student motivation, 2) diversifying teaching assets, 3) enabling personalized learning, 4) facilitating 21st century collaborative skills, and 5) overcoming system stasis.
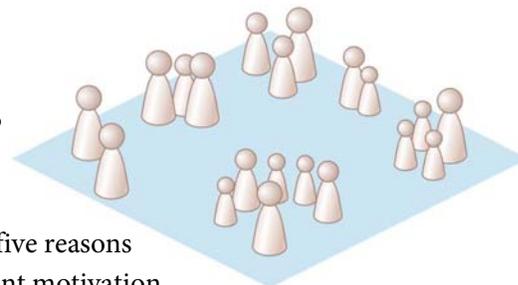
Generating student motivation

Learning happens when motivation meets opportunity. The next generation of learning should be as mindful and clever about student motivation as the present system is blind and dumb. To that end, motivation and the social experiences that shape it should be key design considerations.

To create social conditions that heighten rather than dampen motivation, I strongly endorse an architecture like the multi-age, multi-year classrooms I have observed in Montessori schools for 20 years. These classrooms are typically organized in the following sets: 3 to 5 year olds, 6 to 9 year olds, 10 to 12 year olds, and so forth. Children generally stay with a classroom for three years; as a result, the practices, relationships, and values of the classroom (in essence, the culture) perpetuate and deepen from year to year as teachers and approximately two-thirds of the students return, supplemented by new cohort of younger students to replace those that have "graduated."

Younger students take their cues from their older peers just as younger children have done for millennia. Older children are their role models. Accordingly, in successful multi-age classrooms, teachers do not need to *push* learning because the example of older students is *pulling* the younger ones along.

---

[2] A learning community could refer to a single classroom or clusters of cooperating classrooms.

Through the ages, older children want to be respected and looked up to by younger children. Setting an example for younger students, being a class leader, and showing empathy and patience are invaluable in developing maturity, responsibility, and self-esteem. **The role of self-esteem to learning is the crucial equation in high-poverty classrooms.** As urban educator Elizabeth Slade[3], says: "Few things preserve that fragile equation better than a multi-age grouping."

In a single-age classroom, self-esteem can plummet when a child answers a question wrong, gets laughed at, or messes up a test. In a multi-age classroom, students are busy working on their individual learning activities and are far less aware of who is an "ace" and who is "dumb." In fact, since a multi-age classroom is a true society with rich relationships, each student is valued for their personality and their contributions to the community more than their academic skill.
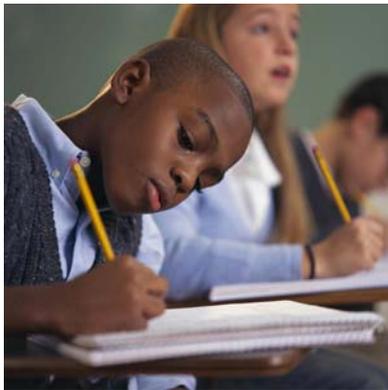
Furthermore, because skills vary widely across the three age levels within each class, differences associated with family background, special needs, or being an English Language Learner (ELL) are less apparent to other students. Instead, **the "message" of a multi-age classroom is that each student has his or her own work to do to learn and master new skills.**

Making multi-age learning communities a core component of the microlabs ensures that student motivation will be at the heart of our new architecture.

Diversifying teaching assets

One goal for designing the next generation of learning should be the diversification and resiliency of the system. The current system is remarkably dependent on the consistency and quality of the head teacher: it is fragile and prone to failure when the head teacher "asset" isn't right.

System redesign is unlikely to eliminate head teachers but much can and should be done to design a system with more diverse and resilient teaching assets. By "teaching assets", I refer to the full aggregate of human and non-human resources that support student learning. In the traditional single-age classroom, the teacher is the key human asset with specialists and perhaps parents playing supporting roles. Non-human assets encompass textbooks, worksheets, and all print and digital learning materials.
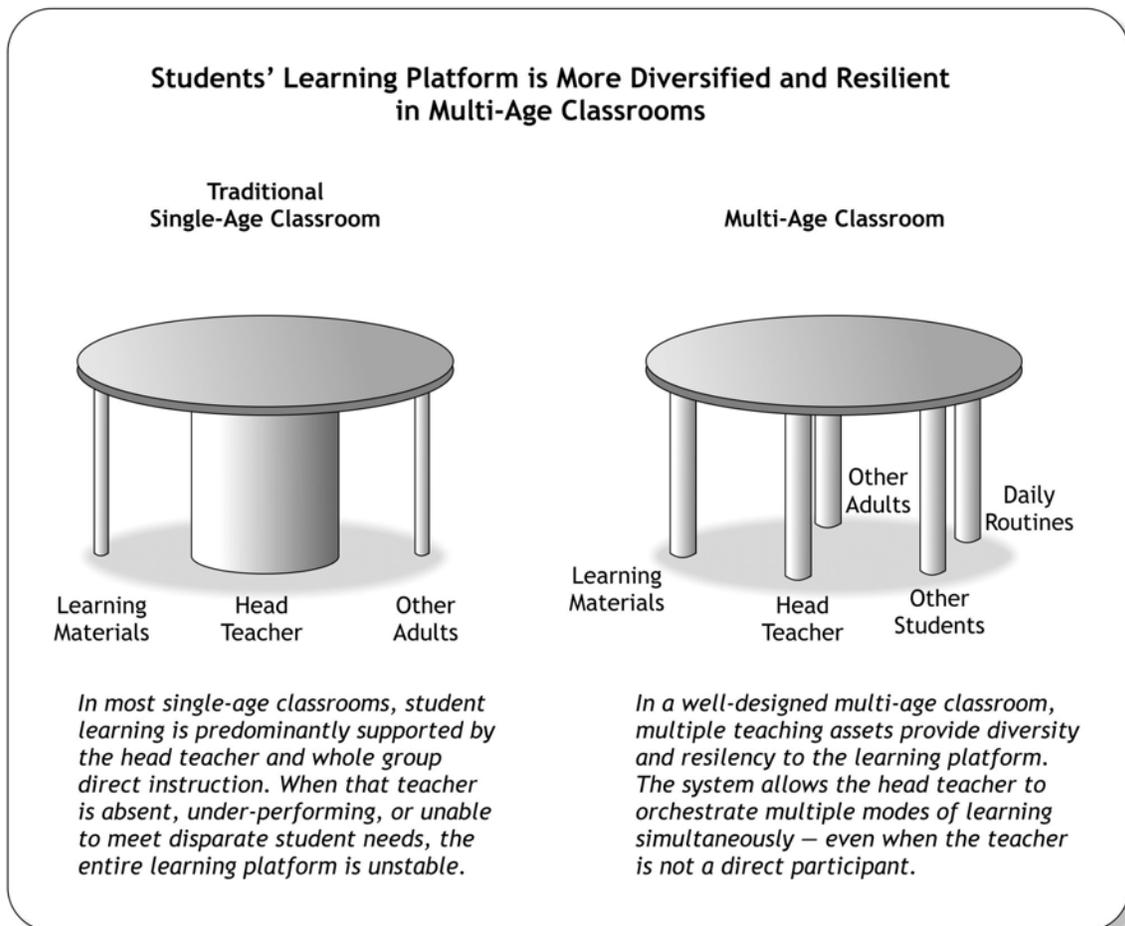
Redesign begins with a deeper understanding of how today's children interpret and respond to these inputs. In combination with his or her social experiences in school, each child's daily

---

[3] Elizabeth Slade has assisted inner city public school districts on effective Montessori initiatives for a decade. New View Montessori Consultancy. elizslade@yahoo.com

interaction these human and non-human teaching assets, and the relationship between them, comprises that child's platform for learning — essentially the system wide version of scaffolding.

As illustrated in the following diagram, the students' learning platform in traditional single-age classrooms is heavily dependent on the head teacher's role in whole group direct instruction. Eliminate or reduce the effectiveness of that primary asset and the remaining teaching assets are typically wholly inadequate for much learning to occur. Consider teacher absences as one example. In a recent radio essay on substitute teachers, commentary Fred Fiske notes that on any given day, 5.2% of American teachers are absent (1.5 times the rate in Great Britain). He then presents the abysmal statistics on the lack of qualifications and training of substitute teachers. As a result, the unpleasant conclusion is that 5% of students' class time is largely wasted.[4]

Students' Learning Platform is More Diversified and Resilient in Multi-Age Classrooms

Traditional Single-Age Classroom

Learning Materials   Head Teacher   Other Adults

Multi-Age Classroom

Learning Materials   Other Adults   Daily Routines   Head Teacher   Other Students

In most single-age classrooms, student learning is predominantly supported by the head teacher and whole group direct instruction. When that teacher is absent, under-performing, or unable to meet disparate student needs, the entire learning platform is unstable.

In a well-designed multi-age classroom, multiple teaching assets provide diversity and resiliency to the learning platform. The system allows the head teacher to orchestrate multiple modes of learning simultaneously — even when the teacher is not a direct participant.

On the other hand, in most multi-age classrooms, individual and small group learning are at least as important as whole group instruction. The daily routine, learning materials, other adults, and even the role of other students operate in profoundly different ways, each adding diversification and resiliency to the learning platform.

---

[4] I have attached a transcript of Fiske's report as an appendix where you can also find the URL.

While it is beyond the scope of this short paper (and my knowledge) to fully describe these differences, **I would like to underscore with the greatest emphasis that multi-age classrooms have an extra, built-in teaching asset**: older (or more proficient) students who can coach and assist younger students. And the benefits accrue to the older student as well as the young one. If the best way to learn is to teach, there's no better place than in a multi-age classroom. If we are seeking to design a cost-effective, high-performing next generation of learning, we would be wise to leverage student-to-student teaching: in both formal and informal varieties.

I close this section on teaching assets and system resiliency with a recent personal anecdote. I happened to observe a classroom on a day on which both the head and assistant teachers were absent. The classroom in question is at the urban, high-minority, public Tobin School in Cambridge, Massachusetts and is one of a number that have been converted to multi-age Montessori configuration.

Elementary students at the public Tobin School explain the daily routines to substitute teachers before beginning individual work.

During the "morning circle" meeting at the beginning of the day, teachers and students dialogued about classroom rules, the daily routine, and schedule for the day. It was incredible to me how much classroom management the students had internalized and how invested they were in the day going according to plan despite the absence of their regular teachers. Following the 15-minute meeting, the students went right back to individual work from the previous afternoon. The substitutes relied on each student's learning diary for guidance. I never saw a single behavioral problem and, to my outsider's eye, learning progressed at a high level throughout the morning I was present.

An example of individual work at Tobin

This is the kind of resiliency that should be a design goal in the next generation of learning regardless of the method and configuration we eventually adopt. Multi-age learning communities are an excellent start.

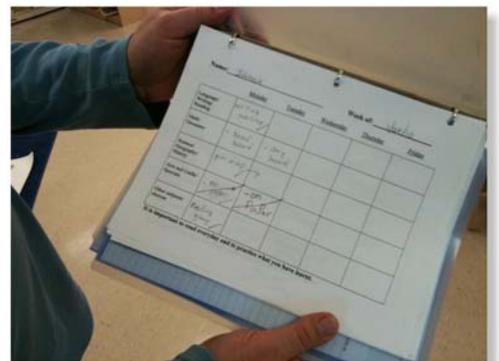**Enabling personalized learning**
Personalized learning has many fans but few practitioners within public education — with the exception of special education and some ELL, it is more aspiration than reality. **I define personalized learning as our ability to offer an educational experience aligned**

A student learning diary at Tobin

with individual needs, interests, and learning styles. It is more than mastery-based learning or individualized learning which depart from single-age grouping and time-pacing but do not typically provide the learning variety and options I associate with personalization.
In system design terms, I think we can agree that personalized learning is possible only after other precedents are met — two are generating student motivation and diversifying teaching assets. (Yes, I acknowledge that a personalized experience may contribute to student motivation, but would argue, is insufficient by itself.) If our vision is high student achievement by personalizing learning, then our new learning architecture must be smart enough to manage variability effectively and efficiently.[5]

As one potential enabler of personalized learning — educational technology — becomes more accessible, multi-age classrooms seems propitiously complementary: the technology delivers the variety of learning choices we seek while multi-age learning communities create favorable teaching practices and social conditions for individual motivation and learning through example, orientation, guidance, and fellowship.

Facilitating 21st century collaborative skills
Not long ago, an educator I know said to a group of prospective parents: "If we want children to make good decisions when they leave high school or when they're behind the wheel of a car at 16, then we'd better start much earlier giving them meaningful practice in making decisions when mistakes are less painful." Taking charge of one's own life and charting a path to optimize one's own circumstances, aspirations, and capabilities is perhaps the top 21st century skill out there.

Children in multi-age learning communities take considerable decision making responsibility for their learning lives within a "freedom within structure" framework. They have the opportunity to not only learn from their own initiatives and experiences but also from those of peers who are pathfinding alongside of them.

In addition, a multi-age environment develops strong interpersonal and collaborative skills in children. Children are accountable and important to each other in ways rarely seen in traditional classrooms. Small group activity and project-based learning foster teamwork.

In all these ways — making decisions, experiencing freedom within structure, and collaborating with others — children in multi-age learning communities are continually practicing that "new division of learning" to which Shoshana Zuboff refers in the opening quote: "one of colleagues and co-learners, of exploration, experimentation, and innovation."

Overcoming system stasis
My final argument for making multi-age learning communities the first cornerstone of the next generation of learning is "if not now, when?" We have only to look at the past 100 years to see how hard it is to change from the task-based, single-age architecture; a hundred factors reinforce the status quo. And, with so few educators exposed to the benefits of multi-age and individualized

---

[5] In Appendix A, I provide a graphic that places personalized learning within a description of next generation learning, including the core problem statement and three fundamental ways we must convert the current system architecture.

education, there is a real risk that it will be discounted until it is too late. There is an ocean of research and literature on multi-age education, most of it overwhelmingly favorable. [6] It is time to translate and augment that research as part of system redesign.

Why make existing schools the locus of innovation with teacher-innovators at the heart of the effort?

Following multi-age learning communities, the second component of this innovation strategy is to house these small, local microlabs within existing schools and power them with teams of teacher-innovators. Passionate and persistent practitioners in the field were at the core of every single high-performing, high-poverty exemplar we studied for The Turnaround Challenge, trying one thing after another until they hit on combinations that motivated students and provided learning opportunities to which students could relate and excel.

In fact, as Eric von Hippel's research has shown for over 20 years, lead users and practitioners are the most important and potent source of innovation in industry after industry. It seems prudent to apply that pattern to innovating the next generation of learning.

In addition, by finding teachers eager to innovate and by housing microlabs in their existing schools, we would be innovating within district frameworks and resources. This presents pros and cons as all the competing forces and stakeholders come into play. Nevertheless, I believe several factors favor the plan:

1. The concrete nature of changes the microlabs seek to effect and their direct focus on children and teachers.

2. The small scale of the initiative locally and that they are opt-in.

3. The potential of the fiscal crisis to increase interest in alternatives.

4. Teachers would be tackling a new approach, but with knowledge and familiarity with their community and students, and with the specialists and administrators they need to work with.

5. Perhaps most importantly, they would be collaborating and potentially team teaching with fellow teachers they respect and have chosen to take this journey with.

Then there's the matter of curricula and learning materials. Laboratory schools set up completely outside existing district norms may prove successful in isolation, but adapting their new methodologies into other district schools would require a total overhaul — a clear barrier to migration. On the other hand, adapting and supplementing existing district standards and materials — already familiar to the microlab teachers — to a multi-age learning community creates a hybrid that eases subsequent migration.

---

[6] Links to research and resources can be found at www.multiage-education.com. One worthwhile literature review (circa 1999) is by Bonnie Moen at http://wsd.waupaca.k12.wi.us/wlc/primary/multi/multigrad.html.

The National Lab would assist microlab teacher-innovators in five critical ways:

1. **Innovation research & best practices** — assembling the best information on the planet with respect to multi-age education and personalized learning, as well as studying and disseminating the discoveries and innovations taking place at the microlabs.

2. **Learning tools & lesson bank** — finding and organizing complementary resources for the optional use of the microlabs.

3. **Training & coaching** — participating teachers would receive intensive training during the summer as they set up their programs. Coaching by National Lab master teachers would take place throughout the life of the program.

4. **Collaborative TeacherSpace** — using the latest social networking software, the National Lab would support a robust platform for exchanging knowledge, solving common problems, and supporting each other.

5. **Grants & program advocacy** — each microlab would receive a small three-year grant as well as national leadership and backing.

The role of the National Lab is crucial to the success of teacher-innovators. When I shared an early version of this microlab scenario with Elizabeth Slade, an education change agent who has spent ten years helping teachers convert to multi-age learning, she stressed that, when push comes to shove, teachers frequently revert to what they are familiar with. She believes this kind of change requires master teachers, coaches, and outside resources to reinforce goals and model how alternative methods can be used successfully.

In a time of growing budget constraints, are the costs for a "Readiness to Learn" counselor and interns or teaching assistants realistic?

I am a firm believer that system redesign should be guided by the financial necessity of reducing, or at the least, not increasing the cost per pupil. Yet how can I reconcile that belief when I have envisioned additional intern or paraprofessional positions and the hiring of a Readiness to Learn[7] staffer to work with students, families, and social service agencies? The answer is explained by the difference between innovating prototypes and going to scale. I will comment on each separately. My familiarity with Montessori classrooms suggests to me that multi-age learning communities work far more effectively when a head teacher is assisted by another staffer who can play a myriad of helpful roles that optimize the head teacher's focus on instructing, evaluating, and coaching students. It would be simple if expensive to assign fully credentialed junior teachers to these roles; however, it may also be possible to staff these roles with high schoolers, college students, or community members — fulfilling other community goals while reducing staff expense. I see experimentation with these positions as a valuable part of the innovation.

---

[7] See *The Turnaround Challenge* for a description of the whole child preparedness that comprises Readiness to Learn.

Similarly, I view the Readiness to Learn staffer at high-poverty microlabs as a key innovation investment, making no judgment of long-term cost/benefit. The main thing, I believe, is to give the teacher-innovators some extra staff resource during these three years so that they can work on Readiness to Learn solutions while they are experimenting with new teaching approaches and piloting new classroom management practices. They are parts of the same system redesign problem. We might find, in the end, that there are ways to redesign the delivery of community services to be in closer synergy with education without the need for additional staff.

Why might microlabs supported by a National Lab be the fastest avenue to changing the educational system?

Innovation in a protected "zone" free from school and district interference has obvious attractions but raises the danger that the new model will not migrate smoothly into traditional schools. Of course, this gap has been our experience with charter school innovation.

James Utterback has written at length about innovation surrounding industries structured around dominant design — as K-12 education is around time-based, single-age classrooms:

> User acceptance of the dominant design of the original innovation created certain boundaries within which subsequent waves of innovation wisely developed….For example, we will see in the next chapter how the displacement of gas lighting by incandescent lighting was advanced by Edison's running wires through the very same pipes that once brought illuminating gas into consumers' homes. […]

> The lesson for technology managers and business strategists is straightforward: understand the constraints of systems, user learning, habits, and collateral assets already imposed by the existing dominant design.[8]

I love that image of Edison running wires through repurposed gas pipes! It's quite an analogy for K-12 education innovation, given that the current dominant design is reinforced by so many levels of standardized systems and regulations, stakeholder expectations and habits, physical infrastructure, and teacher capability! Can we be smart enough to design effective innovation from within? If we could, it would be a big win.

A local microlab, backed by a network of other microlabs and National Lab, would have a clear purpose and mandate: to innovate a new multi-age learning community model adapting and mediating existing and district structures and standards. There would be conflicts and bumps in the road, for sure, yet the emergence of the new model would, in its very existence, be the beginning of change:

- Local teachers and administrators could observe and evaluate the work their peers were doing within the same administrative and academic organizations.

- Schools encouraged by the results would have the freedom and staff expertise to expand the new model year by year.

---

[8] James Utterback, *Mastering the Dynamics of Innovation*, p51

- The cost of converting a cluster of classrooms is low.

- Parents could size up the new approach without being forced into an all-or-nothing decision as when a whole school is redesigned.

- A growing pool of teachers experienced in this new mode of teaching would create new opportunities for other schools and districts.

- By demonstrating that the change can happen at the small unit of a few classrooms, superintendents (and perhaps principals) would be more disposed to taking a small risk.

- Because microlabs made the transition in many diverse states and district environments, the new approach would be seen as "universal" and applicable to any local system.

- Economies of scale will develop as the growing microlab network and National Lab help stimulate commercial partners to produce affordable learning tools and lesson banks.

- District investments in standards and teaching assets could be repurposed or replaced over time, softening the financial impact of change.
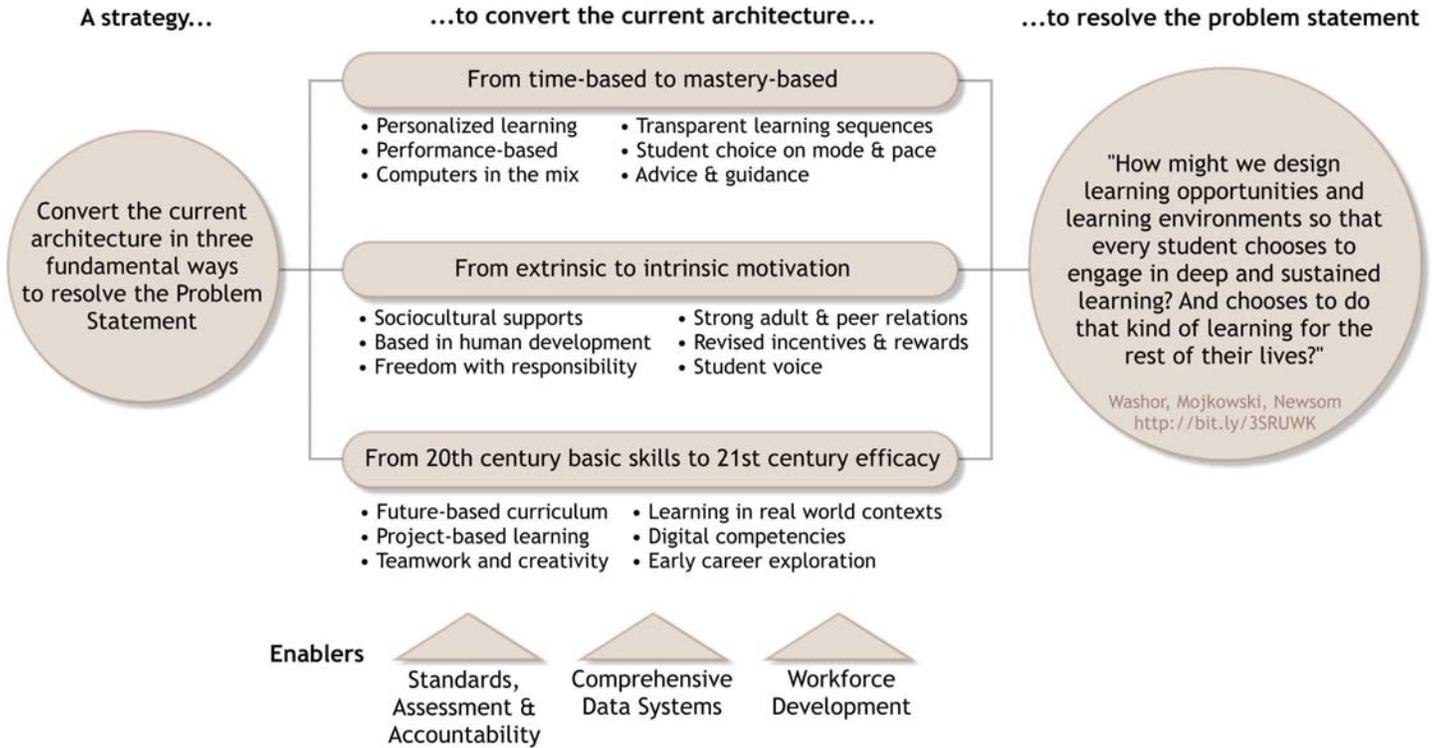
In Closing

While ruminating on education innovation, many precedents and models from other industries have been notable. Of these, I found particularly persuasive the viral and crowdsourcing nature of three precedents:

- the **Linux operating system** created by collective innovation and development to meet a common need; core elements are standardized and branded but customization is also supported;

- the **Institute for Health Care Improvement**'s broad-based participation with an emphasis on innovating with practitioner teams and tackling concrete problems of practice; and

- **New Tech Schools**' shared learning technology assets which comprise a growing inventory of learning modules developed locally but then available across the network.

I believe these examples signify the power of network-driven change needed to create a new model for K-12 education that provides every student with the opportunity to be their best.

Appendix A : excerpted from private correspondence by Dave Lash on 2 November 2009

Conceptualizing the Next Generation of Learning as Converting the Current Architecture in Three Fundamental Ways

A strategy...   ...to convert the current architecture...   ...to resolve the problem statement

Convert the current architecture in three fundamental ways to resolve the Problem Statement

From time-based to mastery-based
- Personalized learning
- Performance-based
- Computers in the mix
- Transparent learning sequences
- Student choice on mode & pace
- Advice & guidance

From extrinsic to intrinsic motivation
- Sociocultural supports
- Based in human development
- Freedom with responsibility
- Strong adult & peer relations
- Revised incentives & rewards
- Student voice

From 20th century basic skills to 21st century efficacy
- Future-based curriculum
- Project-based learning
- Teamwork and creativity
- Learning in real world contexts
- Digital competencies
- Early career exploration

"How might we design learning opportunities and learning environments so that every student chooses to engage in deep and sustained learning? And chooses to do that kind of learning for the rest of their lives?"

Washor, Mojkowski, Newsom
http://bit.ly/3SRUWK

Enablers
- Standards, Assessment & Accountability
- Comprehensive Data Systems
- Workforce Development

NOTES ON THE GRAPHIC

As a **problem statement**, I used two questions that Washor, Mojkowski, and Newsom ask in their clever Apple Store article.[9]

Next, I asked myself "What's the most central, obvious change we need to make to resolve that problem statement?" My answer (yours may vary) was the shift **from a time-based to mastery-based architecture** (reconfiguring curriculum, instruction, assessment, and time). For my money, a mastery-based approach changes the playing field profoundly, creating new challenges for sure but also unlocking many opportunities to improve learning.

But a mastery-based architecture will fail if dropped into our existing system of low cultural support, relative disregard for the

science of child development and cognition, and heavily extrinsic motivation. Therefore, the second essential redesign is to shift emphasis from extrinsic motivation to intrinsic motivation (that is, reconfiguring all sociocultural, developmental, and incentive factors). If our time-based architecture is the most obvious deficiency, student motivation or the lack of it is the dysfunction most deeply mired in cultural values and philosophy and, therefore, likely the most resistant to change.

A third architectural change is from 20th century basic skills to 21st century efficacy. Maria Montessori defined the goal of education as "the development of a complete human being, oriented to the environment, and adapted to his or her time, place and culture." This kind of efficacy is not only a matter of adding new topics to a curriculum, but making learning more immersive, creative, relevant, and in some cases career-oriented. To stretch the architectural analogy, we need to

build new connections between schools and the world beyond.

Finally, I see SAA, CDS, and WD as key enablers of these changes in architecture, especially the capacity to scale innovation over time. However, I would recommend focusing on the desired changes in architecture first and steer investment in these enablers towards reinforcing the new architecture.

© 2010 Dave Lash & Company

---

[9] http://www.bigpicture.org/wp-content/uploads/2009/10/at-the-core-pdk.pdf

Appendix

Training the Subs. Fred Fiske, WAMU Metro Connection, 29 January 2010

http://wamu.org/programs/mc/

Commentator: With new calls coming from President Barack Obama to increase funding for education, senior commentator Fred Fiske says more money must be spent on teacher training:

When we seek solutions to our nation's problems, it's interesting that the word which comes most frequently to mind is "education." Education is key to our success and happiness as individuals, and it's key to our success as a nation. Needless to say, *the* most important element in your child's success in school is the teacher.

We honor and respect our teachers and in recent years have attempted to make their level of compensation more reflective of the importance of their jobs and the training a good teacher should have. For nearly a year of your children's education, kindergarten through twelfth grade, they have substitute teachers. Did you know that 77% of American schools give substitute teachers no training? In 28 states, principals can hire as a sub anyone with a high school diploma. In many states, that person can be as young as 18. Not a single state requires that substitutes hold a teaching degree. On any given day, 5.2% of American teachers are absent. That's 1 ½ times as many as in Britain. And teachers are most likely to be absent on Fridays or Mondays.

You know what explains a lot? Teacher absences are a greater problem at chronically failing schools. A study of substitute teaching finds that subs are often hired without any face-to-face interviews and are often not provided lesson plans or information concerning pupils' possible health problems or special needs. Many substitutes are just expected to keep order, and it's rare that a principal or a supervisor visits a class where the teacher is subbing.

It'll interest you to know that while we've increased teacher salaries substantially, pay for substitutes remains low -- in some places, lower than the school janitor. The problem will be dealt with to some extent by the Substitute Teaching Improvement Act which is now before the Congress. It would require schools to report teacher absences in order to be eligible for Federal stimulus money.

It's troubling to look at worldwide rankings in education and to see the United States, once far in front, slipping in so many areas, principally math and science. If we're to maintain our leadership in economics, living standards, and in the arts, it's imperative that our schools perform better, that our teachers are the best in the world, and that they do not *ever* leave our children's education in the hands of untrained "stand-ins."

This is Fred Fiske.