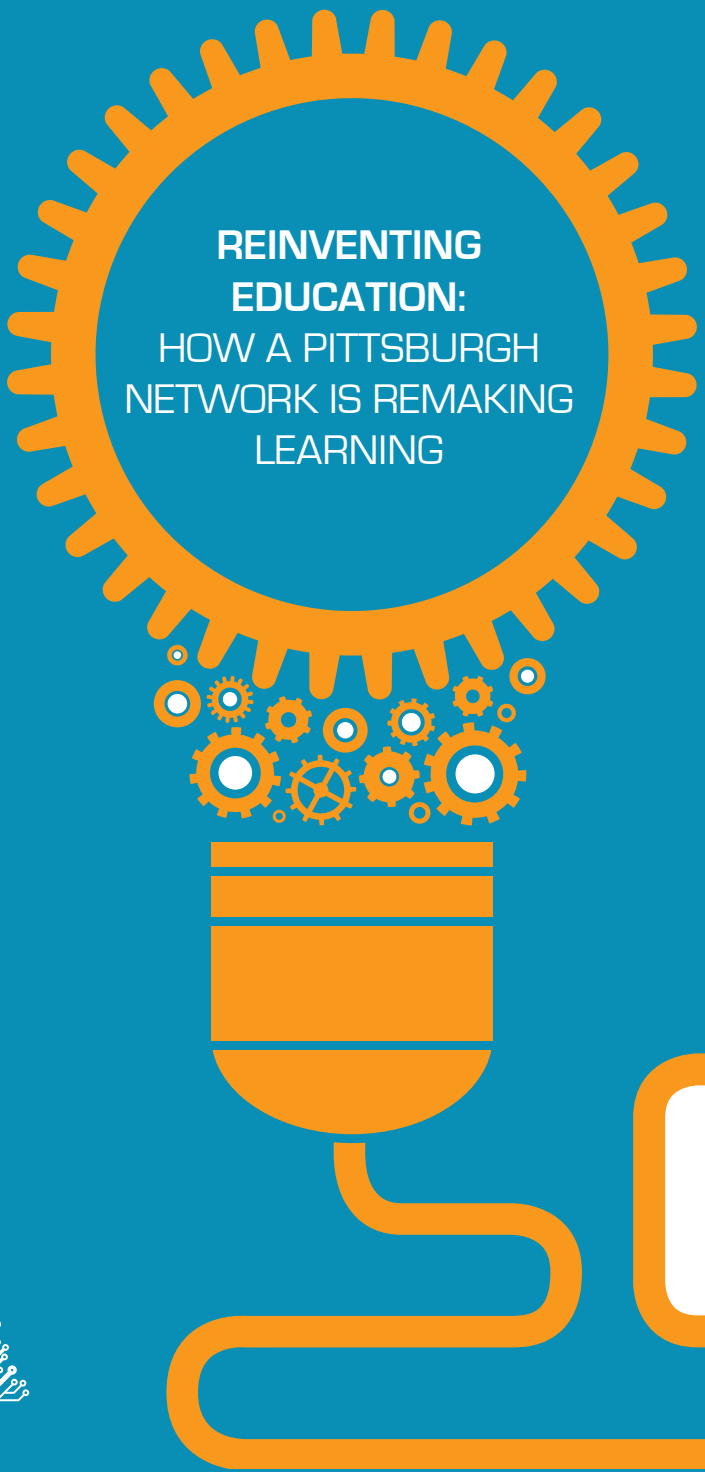
# GETTING SMART ON



## REINVENTING EDUCATION:
HOW A PITTSBURGH NETWORK IS REMAKING LEARNING

IN PARTNERSHIP WITH:

THE GRABLE FOUNDATION
dedicated to improving the lives of children

PUBLISHED BY:
GETTING SMART

# Introduction

Tom Vander Ark, CEO, Getting Smart

## TABLE OF CONTENTS

01 .....Introduction

06 .....South Fayette Schools: A Computational Carnival for Kids

11 .....CMU: Pittsburgh's Learning Engine

14 .....Montour Schools: Home of the Evolving Educators

20 .....Integrated Learning Propels Pittsburgh Students

24 .....Conclusion

## REMAKE LEARNING: A REGIONAL CARNIVAL OF LEARNING

Pittsburgh has emerged as one of the most interesting learning ecosystems in the country. Powered by great universities and invigorated by the Remake Learning (@RemakeLearning) network, the region is a collaborative carnival of learning.

Two recent conferences, #PGHCareerReady and #EdResearchSummit, created the opportunity to visit with dozens of learning partners and school district leaders. For the next few weeks we'll be featuring highlights in the #RemakeLearning series.

### REMAKE BACKSTORY

Remake Learning is a loose network of 250 organizations including schools, 67 districts, universities, libraries, startups, nonprofits, and museums–all focused on engaging, relevant, and equitable learning:

» **Engaging:** Learners have the time, resources, support, environment, and encouragement to be active problem-solvers, creators, innovators, advocates, and citizens.
» **Relevant:** Resonates with today's learner's interests, culture, context, community, identity, abilities, and experiences. Boosts future-ready skills like creativity, problem-solving, critical thinking, and collaboration which will be increasingly salient.
» **Equitable:** More support and opportunities are afforded to those of greatest need.

Starting with a Grable Foundation pancake breakfast in 2007, the initiative grew quickly. After a few years, the Sprout Fund took over management of the network providing mini-grants and hosting

networking activities. Benedum, MacArthur, Hillman, McCune, and Chevron Foundation joined as funders. Philanthropies, businesses, and governments pledged more than $25 million of investment. In 2017, Remake Learning became a fully staffed entity supporting a network of partners, initiatives, strategic planning, communication, and policy efforts.

Remake Learning is really a network of collaborative networks. Working groups focus on STEM, Computer Science for All (CS4All), maker education, professional learning, and policy. District leaders share ideas and resources.

Six Pittsburgh area districts are also members of the League of Innovative Schools: Avonworth, Baldwin-Whitehall, Elizabeth Forward, Fox Chapel, Montour, and South Fayette. The spirit of collaboration between these districts is unusually high. They share resources with each other, regional partners, and numerous visitors.

## UPDATING CAREER READINESS

At the Remake Learning convening on career readiness (#PGHCareerReady), I talked about the #FutureofWork, the conclusions of our #AskAboutAI investigation, and what graduates should know and be able to do. In short:

- The combination  of big data, artificial intelligence, and enabling technologies have created an **unprecedented rate of change**. Add the predictable and unpredictable implications of urbanization, globalization and automation, and young people will experience an enormous amount of change--maybe 10x more than seniors (like me).
- There will be waves of job loss in every region. Some regions that skill up for the automation economy will offset those losses with new job creation.
- Schools should prioritize design thinking and social and emotional learning as core skills for approaching complex adaptive challenges. Developing these skills necessitates extended and integrated challenges--and for many schools that requires new structures, schedules, skills, and supports.
- Tech is evolving faster than civic infrastructure resulting in a backlog of tough issues starting with growing income inequality. Young people need the basics of civic and social change leadership. Schools can convene community conversations that build readiness and resilience.

Source: Ben Filio for Remake Learning

Jason Swanson (@jasonswanson), of the KnowledgeWorks Foundation, talked about the rise of the smart machine. The co-author of The Future of Learning: Redefining Readiness from the Inside Out described how the way we work and how we organize work is changing. Most careers look less like a ladder and more like a mosaic.

Changes in the employment landscape requires us to #RedefineReady, said Swanson. In education that means moving past the historical focus on mastering content, as well as the current focus on thinking and doing, to a #FutureEd focus on feeling and relating. The KnowledgeWorks report places social and emotional learning at the heart of the new graduate profile.

Source: KnowledgeWorks

**Boosting business and community involvement.** "It's all about talent," said Laura Fisher, at the Allegheny Conference on Community Development. Businesses understand that get that but only one in 10 employers are engaged with schools. Fisher says the primary reason is that businesses don't know how to engage.

What complicates involvement is the velocity of change and employee mobility. About 30 million Americans have jobs that didn't exist until recently, added Fisher. More than half of the workforce has less than five years of job tenure. A third of the labor force is changing jobs every year. Most young people will have 10 or 15 jobs before they are 40 years old.

The good news is that business leaders are consistent and clear about what they're looking for in graduates: communication, critical thinking, and interpersonal skills. On #FutureofWork skills, surveyed southwest Pennsylvania CEOs said they're most worried about behavioral skills, leadership, customer-service orientation, and agile and nimble learners.

Susie Puskar of Partner4Work, talked about capitalizing on out-of-school time. Susie leads a workforce development organization that connects funding, expertise, and opportunities to develop a thriving workforce in the Pittsburgh region. Over 7,000 youth in Pittsburgh received work-based learning experiences in out-of-school time through support provided by Partner4Work. She advocates for and supports work-based learning that is relevant to youth and business.

**Big shifts in practice.** Briana Mihok, University of Pittsburgh Institute of Politics, discussed recommendations from her paper, Moving Beyond 20th Century Education: Emerging Trends in CTE and Project-based Learning, including:

» Increase career pathways (example: Ohio Engineering and Science Tech Pathway).
» Increase access to high-quality project-based learning.
» Increase access to job shadowing, internships, and career exploration.
» Incentivize dual enrollment especially early college high schools.
» Create career and technical centers that respond quickly to workforce needs.
» Increase access to and incentives for business/community partnerships.
» Enable school and program flexibility.

"Recognizing that those jobs which exist today might well disappear in the future due to automation, technological changes, and other factors, schools must design CTE and project-based learning programs that address current workforce needs as well as prepare students for the lifetime of learning that will be necessary to adapt to labor market changes," said Mihok.

Linda Hippert spoke about improving school system practices. Dr. Hippert leads the Allegheny Intermediate Unit. She highlighted the state standards for career education and work (benchmarks for grades 5, 8, and 11), including career awareness, preparation, acquisition, retention, and advancement (including a little entrepreneurship). High school students are required to have a guidance plan.

Among the many community partners exhibiting at the conference was Chatham University, a leader in sustainability education (with a smart farm). The entrepreneurial university partners with networks like Propel Schools for quality accelerated teacher preparation.

Forums like this in the Pittsburgh region gather information from grassroots stakeholders in order to plan the actions, systems, and civic direction that intermediaries like Remake Learning can help address. Feedback from the regional audience included a need for:

- Communication with legislators about addressing our region's K-12 education needs
- Opportunities for students to explore careers
- Connections between schools to share models
- Awareness and information about the future of work
- Impactful social emotional learning experiences
- Increased business engagement

Stay tuned for #RemakeLearning features on South Fayette Schools, Montour Schools, Propel Schools, and Carnegie Mellon University.

And plan a visit to Pittsburgh during Remake Learning Days, May 17-26. There will be over 300 events based in schools, businesses, universities, and communities so that families can experience firsthand the future of learning.

Originally posted on December 7, 2017 GettingSmart.com

# South Fayette Schools: A Computational Carnival for Kids

By Tom Vander Ark, CEO, Getting Smart

Combine a makerspace, science fair and a coding bootcamp and you have South Fayette School District, a computational carnival for 3,200 students south of Pittsburgh.

With four schools on one suburban campus, South Fayette is the best example of K-12 integrated computational thinking we've seen. Yes, kids are learning to code, but more importantly, they are learning to attack complex problems, analyze data, and sprint in teams to produce public products.

Former superintendent, Bille Pearce Rondinelli thinks of computational thinking as the new literacy. Embedded into STEAM studio learning model K-12, computational thinking is the problem solving process used in computer science—it's the ability to think logically, algorithmically, abstractly, and recursively.

South Fayette integrates its approach to computational thinking with habits of mind of successful problem solvers, as compiled by Art Costa and Bena Kallick at their organization, The Institute for Habits of Mind. That includes dealing with complexity, persistence, and tolerance for ambiguity. It includes human-centered design thinking strategies and visible thinking.

Source: The Institute for Habits of Mind

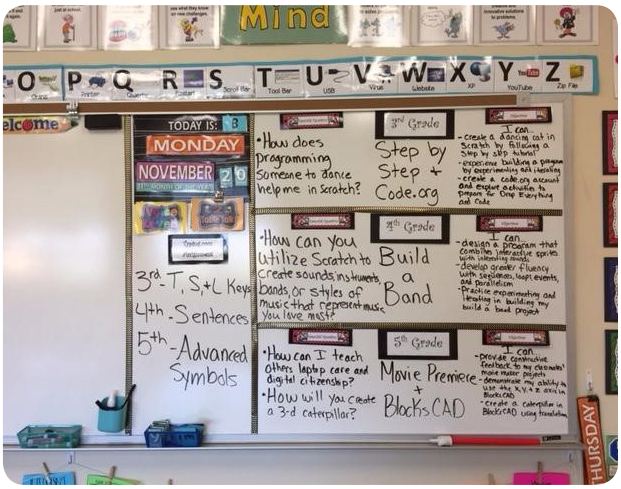
Habits of Mind - South Fayette High School video by SFHS Media on YouTube.

South Fayette students develop Habits of Mind through project-based learning. This video to the left explains more.

Computational thinking is also embedded in career awareness, which includes contexts where the problem-solving processes, dispositions, and attitudes apply. This helps students understand and envision how those careers reflect their learning.

The process of change began in the intermediate grades in 2010 with Scratch coding after school. It was followed by 1:1 initiative starting with the primary grades and rolling up to high school.

Tori Bishop is a STEAM literacy teacher for grades 3-5. Pictures of her focus wall and daily assignments (below) show how teachers integrate coding, computational thinking, and habits of mind.



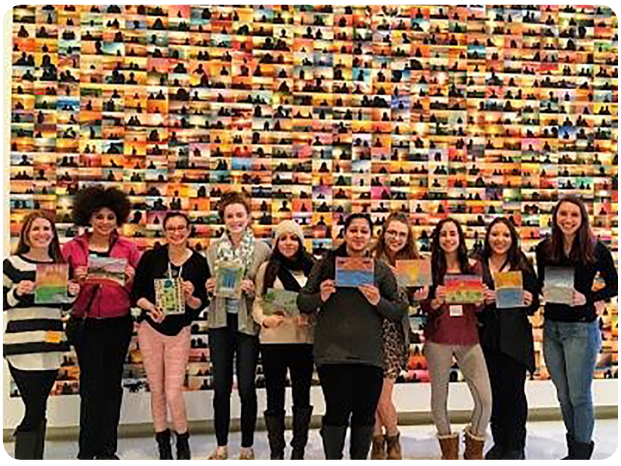

## DESIGN PARTNERS

A half-hour drive north of South Fayette is Carnegie Mellon University (CMU), which has one of the best computer science programs in the world. For Rondinelli's first leadership team meeting, they visited CMU's Create Lab.

"Our partnership with CMU is critical in developing robust pathways and ecologies in computer science and engineering at South Fayette, from high school to university and beyond," said Aileen Owens (@InnovationSFSD), Director of Technology and Innovation.

Over the last nine years South Fayette has been working with computer science professors and researchers at CMU in various capacities. Early on they enlisted the help of professors to lead student teams, provide after-school outreach in computer science, and to engage in educational research together. Today, integrated teams support the development of successful strategies to support computer science K-12.

"In some ways, we have become an incubator for piloting curriculum and strategies that can be implemented to all districts to provide equity in education," said Owens. "The CMU team has continued to connect us to other valuable partners in the computer science department, for the purpose of expanding opportunities to help us reach the next level of development in creating innovative thought leaders," she added.



"To help our students engage in this type of thinking we practice using Visible Thinking strategies and Human Centered Design," said Superintendent Rondinelli.

Visible Thinking routines from Harvard's Project Zero help South Fayette students engage in deeper thinking in spaces like the Learning Lab, STEAM studios, and high school makerspace.

Human Centered Design techniques help students understand the cause of a problem or the needs of the people students are designing for. From there, they can work towards deeper understanding and designing solutions.

"Systems thinking is a mindset for innovation," said Owens. She described the iterative process of innovation and of developing small-scale incubations before full-scale implementation. Owens said education research partnerships were key to understanding what works and why. Equally important is nurturing relationships with students, teachers, families, and community to understand priorities, said Owens.

Companies like All-Clad have supported high school makerspace and student work experiences.

South Fayette and 60 other districts in Southwest Pennsylvania have benefited from and invigorated the Remake Learning Network (@remakelearning) supported by the Grable Foundation and others.

Like four other suburban Pittsburgh districts, South Fayette is a member of the League of Innovative Schools.

What's the key to all of these partnerships? Superintendent Rondinelli said it's follow-through. "We have worked diligently to build a professional reputation that if given the opportunities," like those discussed above, "we will follow through with and for children."

## STUDENT LEADERSHIP

Aileen Owens said that developing student agency and leadership has been core to the South Fayette transformation. Students have learned with teachers and even taken on teaching roles.
For the last four years, student teams have designed and taught Python courses in after-school connected learning experiences to South Fayette students, and as outreach for visiting districts. The students worked collaboratively with the CMU Teknowledge team last year to run a Python incubator to evaluate embedding Python into the 8th grade curriculum for all students. As a result, this year South Fayette now offers the Python course as a mandatory rotation for all 8th graders.

Student teams have also taught professional development in computer science to teachers from the region as part of the STEAM Innovation Summer Institute, offering courses in Python, Raspberry Pi, and App Inventor. Student leaders are designing, beta testing, and taking products from ideation to launch, such as the BusBudE app, and publishing educational research findings on their pen-based software application, MyEduDecks.

Owens thinks student peer networks can accelerate and improve the change process. "Students thrive when they have like-minded peers to work with." She added, "Our entire program was driven by students."

## POSSIBILITY CULTURE

"Our goal is not only to serve the children of our community, but also to set sustainable models that can be replicated, especially by underserved populations, and to collegiality share what we have learned through our partnerships and experiences with others so that all children, and as many educators as possible, may benefit," said Rondinelli.

Lead teachers Dawn McCullough and Brian Garlick have been working with CMU to advance computer science in the middle and high school levels. The integrated team is working side by side as students engage and learn.

All of this work requires capacity development and barrier reduction. A Saturday workshop for staff and students jumpstarted the process. The South Fayette leadership team worked closely with employee groups to redesign student and staff schedules. Substitutes were provided so that teachers could collaborate and attend training sessions at CMU.

The sense of possibility starts early in South Fayette. We visited a primary classroom (below) that was exhibiting their smart city model, complete with QR codes and online explanations.

"A culture of dedication, commitment, and perseverance are all necessary," said Rondinelli.

Superintendent Rondinelli and incoming board chair Alan Vezzi in the new Innovation Creativity Hall

## ALL STAR TEAM

South Fayette has used a mixture of developing internal talent and hiring. Aileen Owens, who joined shortly after Rondinelli, has been the driving force for computational thinking.

Over the last three years, South Fayette has hired STEAM teachers and facilitators for K-8 grades, and changed existing positions and schedules to support STEAM learning and computational thinking. KEy to the K-8 transition were: Melissa Unger, K-2 STEAM Teacher, Shad Wachter, Intermediate School STEAM teacher, Anthony Mannarino, middle school TechEd teacher and Frank Kruth, TechEd teacher who later became the middle school STEAM facilitator. Two teachers team taught an Innovation Studio class at the high school.

South Fayette hired Curriculum and Innovation Coordinator, Stephanie DeLuca, from the Environmental Charter School (one of our 85 K-8 schools worth visiting), where she was running the Thinking Lab.

Superintendent Rondinelli is retiring at the end of the month. Replacing her will be Kenneth Lockette, who was a high school principal and an assistant superintendent for nearby Avonworth School District, also a member of the League of Innovative Schools.

Lockette will boost the arts in STEAM education. In Avondale he launched Studio A, a three-day professional development workshop that partnered with the LUMA Institute and Pittsburgh Center for the Arts to promote project-based learning among teachers. As principal he spearheaded the Pittsburgh Galleries Project that provided a behind-the-scenes view of local museums and brought exhibits to the school's campus.

Add South Fayette to your list of districts worth visiting.

# CMU: Pittsburgh's Learning Engine

Justin Aglio, Director of Academic Achievement and District Innovation, Montour School District and Visiting LearnLab Fellow at Carnegie Mellon University, and Tom Vander Ark, CEO, Getting Smart

Fifty years ago Carnegie Tech and the Mellon Institute merged to form Carnegie Mellon University (CMU). With roots in industry and enterprise, CMU grads have gone on to start tech giants Adobe, Juniper Networks, and Sun Microsystems (now part of Oracle).

CMU's early strength in artificial intelligence yielded Carnegie Learning, a leader in adaptive secondary and postsecondary math software.

CMU professor Dr. Luis Von Ahn started reCAPTCHA (now part of Google), and language learning giant Duolingo. The expertise in natural language processing resulted in more learning startups, including WeSpeke and Lightside Labs (part of Turnitin).

Other education related startups include Niche (formerly CollegeProwler) and Expii, a free platform that embraces diverse learning styles to "empower you to take control of your education." Expii's founder, Dr. Po Shen Loh, is also the national coach of the USA International Mathematical Olympiad team.

Derek Lomas, a Ph.D. graduate from CMU's Human Computer Interaction Institute, founded Playpower Labs, which helps education companies create next-generation learning products based on cognitive science, machine learning, and human-centered design.

In 2002, Jesse Schell, Distinguished Professor of the Practice of Entertainment Technology at CMU, founded Schell Games, the largest full-service education and entertainment game development company in the country.

RoboTutor, a spinoff created by Professor Jack Mostow, was named one of five Global Learning XPRIZE finalists for its software that teaches children basic math and reading skills.

The CMU Center for Technology Transfer and Enterprise Creation has assisted in the formation of more than 50 companies in the last five years, including high-flying artificial intelligence startups.

Machine learning professor Eric Xing's Petuum raised $93 million from SoftBank in October.

## THE SCIENCE OF LEARNING

In addition to being a powerhouse in AI and tech startups, CMU is a leader in learning sciences. Dr. Ken Koedinger leads the CMU LearnLab. Koedinger created Cognitive Models, which features simulations of student thinking that guides the design of educational materials, practices, and technologies. These models led to EdTech tools called Cognitive Tutors which support learning within rich problem-solving environments— the early basis for Carnegie Learning, as well as LearnLab.

LearnLab is one of six NSF funded labs that supports basic and applied learning research. It's also part of the CMU Simon Initiative (@SimonInitiative), named for the late Nobel and Turing prize-winning professor Herbert Simon, which harnesses cross-disciplinary approaches to measurably improve student learning outcomes.

Koedinger believes "Improvement in education will require converting teaching from a solo sport to a community based research activity." LearnLab seeks to support and develop a new generation of learning engineers.

By studying 30 dimensions of teaching across many kinds of courses, LearnLab research led to a set of instructional principles including:

» **Personalized:** Matching up the features of an instructional event with students' personal interests, experiences, or typical patterns of language use, may lead to more robust learning compared to instruction that is not personalized.
» **Visual:** Instruction which includes both visual and verbal information leads to more robust learning than instruction that includes verbal alone.
» **Guided:** Instruction leads to more robust learning when it guides the learner's attention toward relevant features.

**Examples:** Students learn more efficiently and robustly when more frequent study of worked examples is interleaved with problem solving practice.

"Every school and university should be a LearnLab," said Koedinger. To improve the ability for K-12 schools to make active use of learning science they will need shared data infrastructure and learning analytic methods (for more see the Global Learning Council report).

## DISTRICT PARTNERSHIPS

CMU is known for its industry partnerships in AI, computing, and robotics. They have extended this expertise to local districts to help shape a K-12 approach to computer science. Two partners include Montour and South Fayette, two small districts west of Pittsburgh.

Almost a decade ago the districts enlisted the help of professors to lead student teams, provide after-school outreach in computer science, to engage in educational research together, and to create successful strategies to support computer science K-12.

South Fayette Director of Technology and Innovation Aileen Owens (@InnovationSFSD) said, "We have become an incubator for piloting curriculum and strategies that can be implemented to all districts to provide equity in education. The CMU team has continued to connect us to other valuable partners in the computer science department, for the purpose of expanding opportunities to help us reach the next level of development in creating innovative thought leaders."

## EDUCATION RESEARCH SUMMIT

Last month CMU and the Montour School District hosted an #EdResearchSummit. The first day was held at the Gates Center at CMU (right) and the second at Montour School District.

Dr. Ashley Coudriet, LearnLab Research Fellow (sponsored by the Grable Foundation), kicked off day one of the summit. Coudriet serves as a liaison between CMU and LearnLab school district partners (Montour School District, Cornell School District, Carlynton School District, and Armstrong School District). In addition to

the LearnLab districts, dozens of school district teams including superintendents, principals, and teachers participated in the summit through group discussions and roundtable presentations of best practices.

Equity was a focus of the research summit, and scholarships for registration to underserved districts were provided by the Heinz Endowments.

John Balash (@J_Balash), Educational Network Coordinator at the CMU Entertainment Technology Center, kicked off the research summit introducing teams investigating augmented and virtual experiences, game-based learning through empathy and problem-solving, and digital tools promoting critical-thinking and collaboration.

Ken Koedinger presented the challenges of applying learning sciences. The first problem is that the research isn't conclusive. Only 10 percent of federally funded randomized controlled trials show significant positive results. The second problem is that experts from different fields— cognitive neuroscience, psychology, education leadership— don't agree.

Dr. John Stamper (@JohnCStamper), Technical Director of the Pittsburgh Science of Learning Center DataShop, spoke about forming a learning engineering community by engaging schools in research partnerships.

Stamper's main area of research is focused on using "Big Data" from educational systems to improve learning. An expert on intelligent tutoring systems, Stamper is founder of TutorGen (@TutorGen), a scalable adaptive scoring engine. He's also the lead researcher behind DataShop, a big repository of open data from learning systems.

Additional presentations on day one included Mixed-Virtual Reality with Dr. Nesra Yannier (@NesraYannier), AI as Cognitive Augmentation with Ken Holstein (@d19fe8), Open Learning Initiative, and Turning Research into Practice by Carnegie Learning.

Day two of the summit was kicked off by Dr. Christopher Stone, superintendent at Montour, followed by the executive director of the Grable Foundation, Gregg Behr. Tom led a discussion about the future of learning. Justin led a tour of Montour high school and elementary schools, which included observing practitioners in action, roundtable presentations by participating attendees (supported by OnHand Schools), and a closing by Stanley Thompson of the Heinz Endowments.

The #EdResearchSummit illustrated that CMU has become one of the world's leading engines of education innovations, including machine intelligence, learning sciences, cognitive tutoring, and new media. The complementary #RemakeLearning initiative has boosted regional interest in active learning and community partnerships. Both CMU and the Remake Learning Network make Pittsburgh one of the most interesting education ecosystems in the country.

# Montour Schools: Home of the Evolving Educators

Tom Vander Ark, CEO, Getting Smart

Halfway between the Pittsburgh airport and downtown, you pass through the Montour School District which serves five towns and 3,000 students. About a third of students live in or near poverty.

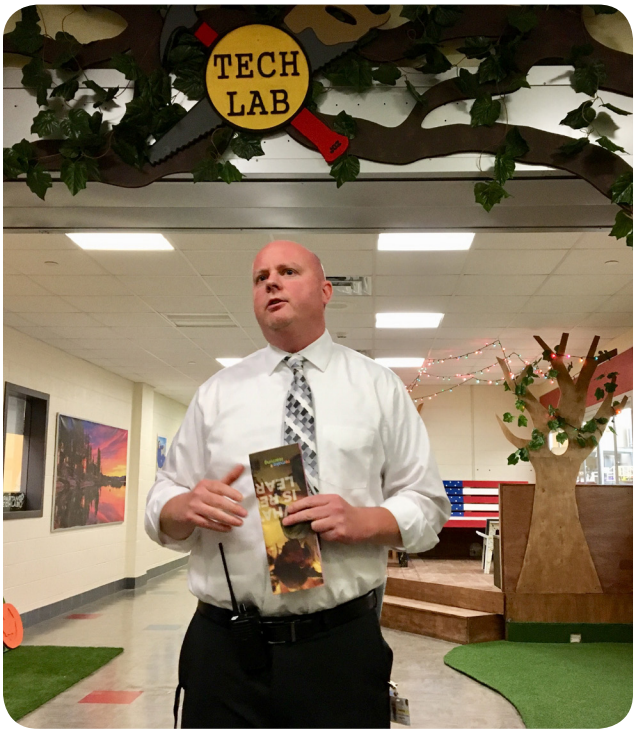
"Home of the evolving educators," Montour is led by Dr. Christopher Stone (@CHRISSTONE111) who was the middle school principal 10 years ago.

Stone (pictured above) and his colleagues are "creating a culture of moonshot thinkers." They use what Stone called sound risk-taking and outside of the box pedagogical strategies to keep students motivated and engaged.

## HIGH SCHOOL OPPORTUNITIES

When discussing traditional high schools, Todd Price, the Pennsylvania Principal of the Year (below), said, "We treat 16 to 18 year old young people like little kids." He leads the high school where they have eliminated bells and have added an hour of choice for personalized learning.

Students are at the center in Montour, which means "that some decisions may be non traditional," Price said Students designed the school flag through the school's project-based course created with an emphasis on human-centered design thinking.




"Failure is OK in this building," said Price. "You're going to learn more by not being successful than by being successful."

The high school includes plenty of options, including six engineering courses and eight AP courses.

The Tech Lab includes four large well-equipped makerspaces. A virtual immersion lab features 3D Zspace computers. Students start using Autodesk Inventor design software in middle school and build amazing creations in high school.

While there are a couple of cool makerspaces, Price said that more important than the space is developing a maker culture.

"We pay attention to mental health," said Price. A no-tech lounge is a place where teens can talk about what's going on. Montour is piloting an empathy curriculum with NGLC.

Below, Justin Aglio (@JustinAglio), the district's Director of Innovation and Director of Academic Achievement, stands in a high school hallway that illustrates the district's core values: putting children first, supporting growth mindset, and creating a learning culture.

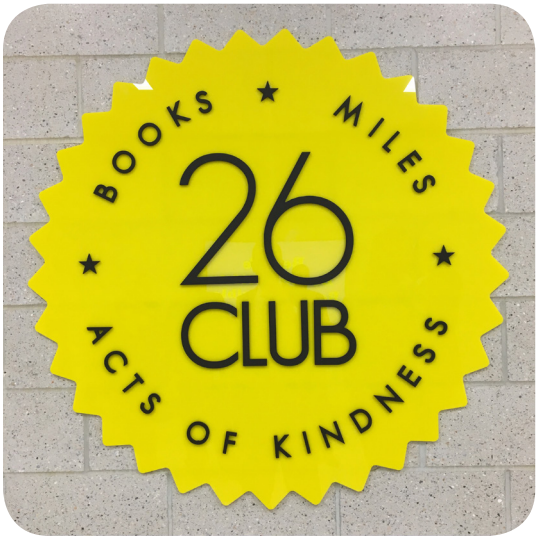
## ELEMENTARY SCHOOLS

The new elementary building is home to two schools: Team Discovery and Team Curiosity. A teacher steering committee selected creative furniture to engage group discussions and accommodate individual comfort. The furniture selection includes desks for small group instruction, optional seating for students with stand-up desks, ball seating for additional movement, and traditional chairs.

A big learning lab looks like a sky chalet. Upstairs is a LEGO Makerspace. Co-principal Jason Burik (@jasonburikmsd) is a world-renowned LEGO artist. "LEGO has always been a passion of mine, and now I am excited to not only share my love for education with everyone but also showcase how LEGOs are used to support learning," said Burik.

The new school features a Minecraft Education Lab. “We are so excited to be part of the conversation and transformation happening there and hope to share what we learn together with other districts and schools around the world,” said Meenoo Rami, Manager for Minecraft Education at Microsoft.

The LEGO Makerspace is also home to NoRILLA (below), an online and hands-on system that helps students evaluate building stability in a seismic zone. Students pick or build towers and subject them to shaking to see if one or both of them falls over, and in doing so they learn about physics.




The elementary schools feature the 26 Club, where students run 26 miles, read 26 books, and complete 26 acts of kindness.

Every K-12 student has a Chromebook (including special touchscreen Chromebooks for students grades K-4). Google classroom is used to make and manage assignments in grades 3-12.

A well-equipped calming sensory room, developed in partnership with Slippery Rock University, is used to de-escalate situations among students with special learning needs.

The elementary schools are organized into grades K, 1-2, and 3-4 clusters each with common space, including eight circular areas with whiteboard paint on the walls to promote collaboration. They share an outdoor amphitheater.

## DISTRICT WORTH VISITING

Like many districts supported by the #RemakeLearning network in Pittsburgh, Montour is a district alive with learning.

Montour is a great place to learn for adults, too. With the Allegheny Intermediate Unit, Montour created TransformED West to provide professional development opportunities including design thinking sessions, technology integration sessions and other activities designed to remake learning for all.

Housed in a high school classroom, the Carnegie Mellon University (CMU) LearnLab at Montour convenes classroom teachers from three districts and university researchers to help introduce evidence-based EdTech projects into classrooms, as well as take science and mathematics instruction to the next level. Recently Montour hosted an #EdResearchSummit with CMU.

Montour is recognized by Common Sense Media as a Common Sense District for its instruction in digital citizenship.

Like five other innovative small districts around Pittsburgh, Montour is a member of the League of Innovative Schools.

Next time you fly into Pittsburgh, stop and visit Montour where empowered educators, community partnerships, and networks of like minded schools inspire powerful learning.

# Integrated Learning Propels Pittsburgh Students

Tom Vander Ark, CEO, Getting Smart

Jeremy Resnick started teaching in 1987. Even though his mother is famous educator and Pitt professor Lauren Resnick, Jeremy said his first year of teaching was like living in foreign country.

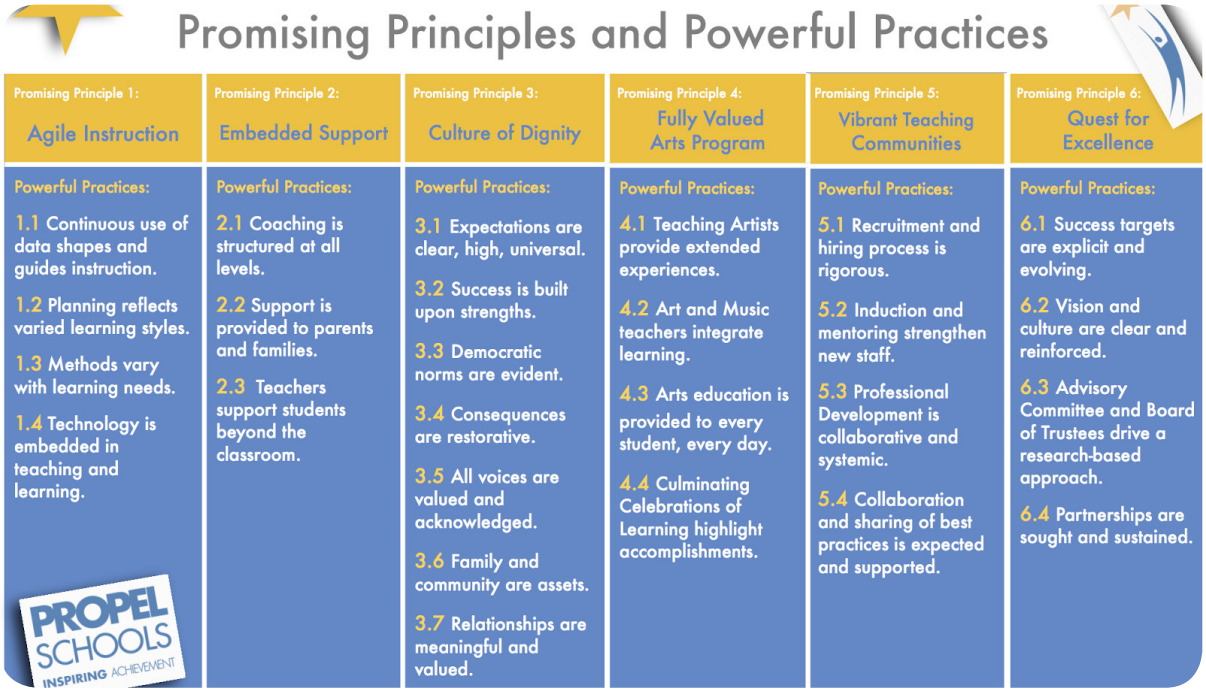
He began to wonder if schools could move the needle on life outcomes for kids in poverty. Jeremy began exploring new options for youth. He founded a career center, a charter school, and the Charter Schools Project at Duquesne University.

In 2003, Jeremy co-founded Propel, a school in the basement of an old hospital with the goal of providing great schools to families who would otherwise not have access.

When asked to describe the Propel learning model, Jeremy first describes a culture of possibility. The early work led to a shared value."Propel does not accept the premise that poverty or family structure determines education performance or life outcome."

Shared values and plenty of lessons learned led to six promising principles: agile instruction, embedded support, culture of dignity, fully valued arts program, vibrant teaching communities, and a quest for excellence.

There are now a set of powerful practices to go with each of the principles:




Source: Propel Schools

Propel Schools serves 4000 students at 13 Pittsburgh campuses. Over 80 percent of the students live in or near poverty. About the same percentage are kids of color. Almost a fifth have special needs. A third of students have involvement with county human services.

The nonprofit network exists to close education and experience gaps and transform the lives of children in underserved Pittsburgh communities through innovative, student-centered learning.
Given the level of challenge children bring to school, Propel provides a wide range of support services. "Embedded Support is one of our principles," said Jeremy. "We support kids individually–also parents and teachers, whatever the challenge is."

Fund My Future is an example of family supports. The program helps Propel families start savings accounts for kids. It has generated more than $130,000 in parent deposits benefiting over 2,000 students.

Secondary students participate in a daily small group advisory to support sustained relationships, monitor progress, and develop agency.

A longer day and year (providing 25 percent more time than traditional schools) supports full integration of the arts. Jeremy sees the arts as an important way for youth to connect to their own culture as well as explore others.

Jeremy said that because teacher preparation enrollments are down, it's getting harder to hire great teachers. To boost the pipeline, Propel established the Pittsburgh Urban Teaching Corps with Chatham University for teacher preparation. If you don't know Chatham, check out the Falk School of Sustainability & Environment on the 388-acre Eden Hall Campus.

The Propel team recruits candidates from the program and its teachers and administrators serve as adjunct faculty. One quarter of the 80 teachers hired for this school year came through the network specific training program and the goal is to develop another 130 teachers in the next five years. The teacher prep program costs about $60,000 per teacher (half stipend, half tuition). Jeremy is trying to raise another $4 million to support the program.

Speaking of building a talent pipeline, Dr Tina Chekan, CEO of Propel Schools was a founding kindergarten teacher in 2003. She worked her way up to Literacy Coach, Principal, and Assistant Superintendent.

## INNOVATION & STEAM INTEGRATION

Kristen Golomb (@MrsGolomb) joined Propel as science teacher in 2006. Today she is the Director of Innovation leading the implementation of a bundle of student-centered learning practices, including big integrated projects, coding, and maker. The project-based learning (PBL) framework was built with Pittsburgh design shop LUMA Institute.

K-4 students engage in Integrated Learning Experiences including computer science and the arts to develop transferable skills through a 30 hour integration class. The class is taught by integration educators and there are two integrated projects co-taught by teachers and integration educators.

Emily Cain is a K-4 integration educator that supports the development of project-based units. She sees every K-4 student each week. Jeffrey Patrick, also an integration educator, teaches elementary coding while co-teaching and co-planning PBL units that incorporate these skills into the regular ed classrooms.

Middle level students take between 10 and 30 hours of integrated electives that incorporate Computer Science and the arts into project-based units.

Studio 4-C is a middle school project-based class that combines art, social studies, and technology with a focus on critical thinking, collaboration, creativity, and communication.
Studio 4-C teacher Patrick Hammonds focuses on identity in 6th grade, change in the 7th, as well as freedom in 8th grade. He said, "Partnerships with Educurious, Verizon Innovative Learning, Remake Learning, and others ensure I'm as dedicated to self-improvement as I want my students to be."

Project-based units require students to engage in multidisciplinary projects including authentic uses for 3D printing. "We have been given the opportunity to transform student-centered learning in our region, due to the hard work and dedication of the Remake Learning Network," said science teacher Kristen Golomb.

Heather Harvey (@mrsharveypcs), a technology integration specialist supports the use of the Google suite, Minecraft, AR/VR, and tech-enabled project-based learning. Propel supports smart uses of tech with Digital Citizenship Family Nights.

In partnership with GTECH Strategies and Starbucks, 6th grade Propel students studied environmental issues that plagued the Pittsburgh region and decided to make change. They designed a school rain garden that the high school students and 3rd grade students built and grew. Below, high school environmental students and 3rd grade science students learning plant growth and development.

Propel high schools offer the same relevance and rigor as K-8 schools. A Freshman Seminar boosts self-management and learning skills. The 1:1 environments feature Project Lead The Way (PLTW) and dual enrollment courses. Every student benefits from service learning and internships.

Propel is a model of how a group of schools with shared ideals, practices, and tools can change the life trajectories of youth from low income neighborhoods and, in doing so, revitalize communities.

# Conclusion

Tom Vander Ark, CEO, Getting Smart

## BUILDING A SHARED VISION OF THE #FUTUREOFLEARNING

The #EdResearchSummit in Pittsburgh was co-hosted by Montour Schools (featured here) and Carnegie Mellon University (featured here). In the summit's opening session we discussed 10 aspects of the future of learning. Links to recent resources are included below in addition to comments from Pittsburgh educators.

1. **Learner Experience:** Active learning, design thinking, and project-based learning focused on broader aims.
   - » Focus on social and emotional learning (listen to a podcast with CASEL chair Tim Shriver).
   - » Combinations of personalized and project-based learning.
   - » #PlaceBasedEd: community as the classroom, community partnerships.
   - » Adaptive learning and smart digital assistants.
   - » Augmented and virtual reality as the new UI for learning.
   - » Big data and artificial intelligence makes every subject computational (we call it cause + code).

2. **Youth Development:** Relationships, supports, and application.
   - » Integrating youth development principles (see Springpoint design principles).
   - » Advisory: every secondary school needs a distributed guidance and support system that provides sustained relationships, academic monitoring, culture building, and links to supports (see 5 core and 10 optional features).
   - » Opportunities to apply learning in work, service, and civic settings (see post on service learning at Quest ECHS, Houston).
   - » Digital Citizenship: students taking responsibility for online actions and being aware of algorithms driving what they consume on every screen.

3. **Assessment for Growth:** Real time integrated feedback.
   - » Everything is formative and supports growth (see discussion of formative assessment).
   - » Automagically combined formative (this will take big improvements in interoperability, read this report for more).
   - » Provide feedback on social and emotional skills (but avoid including immature measures in accountability systems according to Roger Weissberg, CASEL).

4. **Comprehensive Learner Profiles:** Portable personalization.
   - » States will expand their electronic student record (listen to a podcast on Georgia's use of Total Learning Architecture).
   - » Parents and learners will gain access to a comprehensive profile with contributions from school, after-school programs, tutors, and online providers.
   - » A digital portfolio captures a collection of personal bests.

5. **Competency and Credentials:** show what you know, progress on mastery, share your capabilities.
   - » Schools will shift to competency-based learning progressions where students progress based on demonstrated mastery.
   - » Dynamic learning models combine individual, team, skill group, and cohort experiences.
   - » High school students will have expanded access to dual enrollment with easy transfer and career and technical learn and earn ladders.
   - » Learners will share mastery transcripts with postsecondary institutions.
   - » Blockchain technology will make it easy to capture and share capabilities (see a summary of a new European report).

6. **Talent Development:** Personalized professional learning.
   - » Personal learning plans drive participation in microcredentials.
   - » AI powered recruiting, onboarding, and personalized development (listen to Mike Moe discuss AI in HR).

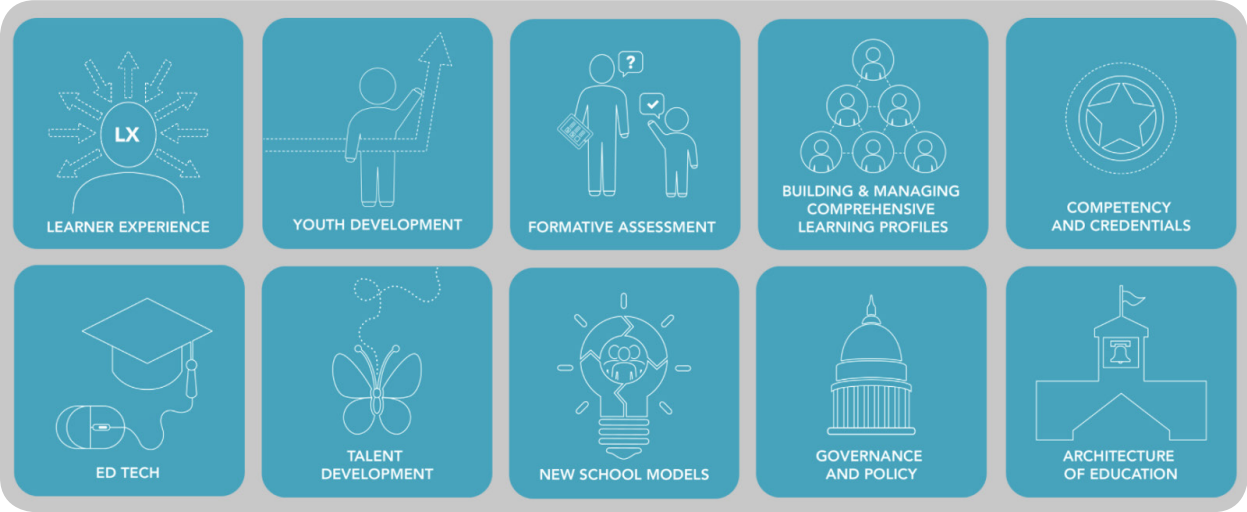
7. **EdTech:** Renewed innovation (after a 2-3 year plateau).
   - » AI behind everything in EdTech: learning platforms, scheduling, transportation, and budgeting.
   - » Customized toolset support networks of schools (e.g., Summit Learning, New Tech Network).
   - » More immersive experiences within a collaborative environment, more mixed reality to boost #GlobalEd.
   - » Assistive Technologies - tapping into VR, e.g. Samsung working with vision impaired.
   - » Transcript and credential innovation on blockchain technology.

8. **New School Models:** Personalized and project-based learning models.
   - » Embracing broader aims: social and emotional learning and growth mindset.
   - » Working together in school networks.
   - » Embracing the community as a classroom and #PlaceBasedEd.
   - » Equipping youth for contribution (see 32 most important issues).

| 32 Global Goals | | | | | | | |
|---|---|---|---|---|---|---|---|
| Extend Dignity | Improve Impact Strategies | Enterprise & Innovation | Fitness & Longevity | Mindfulness & Character | Cultural Competence | Lifelong Learning | Lifelong Powerful Expressions |
| End Hunger | Eradicate Poverty | Healthy Growth & Early Learning | Better Information for Global Health | Innovations for Global Health | Understanding the Brain | Human Augmentation | Support Human Thriving |
| Climate Action | Affordable & Clean Energy | Sustainable Economic Growth | Robust Public Commercial Infrastructure | Sustainable Cities & Habitats | Clean Water & Sanitation | Life Below Water | Life On Land |
| Justice & Strong Institutions | Sustainable Agriculture | Beautiful Shared Spaces | Peace & Security | Constructive & Safe Use of AI | Privacy & Cybersecurity | Accelerate Discovery | Explore Space |

9. **Governance and Policy:** Regional partnerships match policy and capacity.
   - » Regional progress on competency-based learning: school networks, competency-based diplomas, and higher education acceptance (e.g., Great Schools Partnership in New England).
   - » City partnerships for talent development, investment, incubation, and work-based learning.
   - » State funding: weighted, portable, and performance-based.

10. **Architecture of Education:** Learning spaces that support active learning models.
    - » Green schools: schools that exhibit and teach sustainability.
    - » More leased space for dynamic facilities provisioning (see WeWork school).
    - » Rideshare and autonomous student transportation.




We're looking forward to imagining and building #FutureofLearning with you this year.

Originally posted on January 4, 2018 GettingSmart.com

PUBLISHED BY:

GETTING SMART

IN PARTNERSHIP WITH:

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