CREATING THE NEXT GENERATION OF INNOVATORS
Our educational system has been designed to test for knowledge and to teach to tests that measure said knowledge. We train our students for tests, but they crave applied learning opportunities to connect their knowledge to the real world. Employers are looking for talent that can problem-solve, work well in teams, ask good questions, communicate and apply knowledge and skills.¹

**A NEW PARADIGM**

As the current educational system was influenced by the industrial age, economic forces and trends today are shifting the current paradigm and a new educational system needs to emerge. The world is increasingly crowdsourcing knowledge as evidenced by Massive Open Online Classes (MOOCs) and private enterprises like Khan Academy. Top trends like wearable technology, robotics, digital badges and makerspaces have schools wondering how to keep up, much less plan for the future. Rather than react to the shift, a proactive revolution is needed in the way we think about education; we need to disrupt the “old school” way of educating our students (and teachers). To do this, we need to look outside the school walls and ask, “What’s working?”

The winners in the modern economy are using the design thinking process, where problems are framed by asking, “How might we...” The question at hand is “How might we (schools) pivot away from the ‘old school’ model and define the next paradigm to educate the next generation of innovators?” A place to start would be to invite the community to participate and help co-create the future of education. Schools should seek to step away from the “teach and test” mentality and embrace a motivating learning environment that creates opportunities to apply knowledge, investigate problems, apply solutions and learn from the results.

**A GROWING VOID**

The new paradigm requires a commitment to instructional strategy. Schools are filling a growing void of applied learning through electives and extra curricular and co-curricular offerings. Some schools are replacing their traditional Introductory Business class with Entrepreneurship. Faculty are working hard to keep one step ahead of digital natives who may feel more comfortable in these new learning opportunities than most of their teachers.

Schools that are able to find faculty qualified to teach current coding languages and can offer them for computer science class credit are in the minority.

Despite a scarcity of qualified instructors to teach current and emerging computer languages, motivated students self-teach through Code Academy or enlist a peer to tutor them. Some, like three recent IMSA alumni, have created their own CS curriculum called Open SCSI. Others register to learn and apply coding through programs like Dev Bootcamp after graduation or take a gap year to supplement their resume before college or as an alternative to higher education.

**OUR SCHOOLS NEED TO LOOK FOR NEW CURRICULAR PATHWAYS TO KEEP UP WITH THESE NEW LANGUAGE AND ENTREPRENEURSHIP CURRICULUM PIVOTS.**

During this educational paradigm shift, parents are seeking outside opportunities for their children to supplement traditional education. Workshops, summer camps and educational program offerings on weekends and during the summer become resume builders to prepare their children applying for college. Growth of external providers is quite disruptive, but perhaps this disruption is what we need to motivate school systems to adapt, to create more lean, nimble and responsive schools to prepare our learners. Our schools need to look for new curricular pathways to keep up with these new language and entrepreneurship curriculum pivots.

**RETHINKING THE SYSTEM**

The current educational system needs to embrace a sense-and-respond instructional strategy to prepare students to enter the workforce of tomorrow. We must collaborate with the new economy to continuously shape the minds of today to get them ready for the future needs of employers.
A bolder idea would be for the entire pipeline of education to rethink what skills our learners need and reimagine what schools need to look like as a result. Without a strategic commitment, today’s educational systems may not be able to meet the challenge. The journey begins by looking at examples of what’s working.

**A NEW SOLUTION: IN2, THE STEVE AND JAMIE CHEN CENTER FOR IMAGINATION AND INQUIRY**

The Illinois Mathematics and Science Academy (IMSA) in Aurora, IL believes that problems have many solutions. IMSA is creating a new physical space (an innovation center) to be an organic, crowd sourced solution to prototype and test new models of educating the next generation of innovators. This non-traditional hub will be chalked with novel programs to pilot a new educational model around innovation and entrepreneurship. A 6,400 square foot renovation at IMSA is currently underway and due to open in the fall of 2016. This innovation center has been named IN2, denoting Innovation and Inquiry, words that represent two of IMSA’s cornerstones. IN2 embodies the ideals of innovation and collaboration that led to the Academy’s founding in 1985.

IN2 is a physical place to practice connected learning, a concept shared by Dr. Sam Dyson at the 2015 NSTA conference. Connected learning is based upon three learning principles: interest powered, peer supported and academic/career/civic payoff and the three design principles of production-oriented, openly-networked and shared purpose.

IN2 creates what Ray Oldenburg calls a “third space” for a new type of learning community. A third space is shaped by its regular clientele and characterized by a playful mood, contrasting with people’s more serious involvement in other areas. Distilled down, education needs to design new spaces for our learners (of all ages) to “Hang Out, Mess Around and Geek Out” (HOMAGO). A place that is comfortable, nurtures a feeling of community and openly embraces failure as a First Attempt In Learning.

Innovation and entrepreneurship hubs and incubators are a part of our Illinois community and higher education institutions and other innovation centers in industry and government. Connecting IMSA to Illinois innovation centers creates vast possibilities of mentors and problem-solving team members and fuels the STEM pipeline. IN2 is a critical link to the innovation pipeline, connecting secondary schools to higher education and industry, it also acts as an incubator for novel ideas and solutions to the important problems of our time.

The beauty of IN2 is that it is agile enough to respond and adapt to the changing needs of its community. IN2 is designed to provide real-time, innovative education. IMSA and other educators, STEM entrepreneurs and community partners will come together to design, co-create and test new technologies, services and methods to advance STEM teaching, learning and talent development.

**CONNECTING CLASSROOM LEARNING TO THE REAL WORLD**

Innovators and early adopters will be able to come together in a dynamic ideation, learning, collaboration

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**DEVELOPMENT OF IN2**

IN2’s design process began by visiting best practices in Silicon Valley innovation and small start-up spaces and industry icons like Facebook and Google. The search also included the abundant innovation resources in Chicago, Rockford, Peoria and Urbana in Illinois as well as Boston at MIT and Harvard Innovation Hub. The blueprint for IN2 was shaped through active community and stakeholder engagement. Input sessions, a design charrette and fieldtrips to study best practices of physical spaces and programming included students, faculty, staff, alumni and external stakeholders. A resounding theme through all successful innovation spaces is that people in collaboration are the key to success; space, furniture and technology are only tools to encourage people to be present.
and makerspace at IMSA that connects and leverages the strengths of entrepreneurial, academic and work cultures. Students will learn coding, start-up principles and how to take an idea from concept to creation. They’ll engage with real time design and product development teams and collaborate with STEM entrepreneurs on real-world start-ups.

Students will use tools in a clean MakerSpace (not requiring hazard control or ventilation hoods) to rapid prototype their minimum viable product (MVP) with 3-D design and manufacturing software. The innovation center will host programs and opportunities open to IN2 network partner schools designed to stimulate and support STEM-focused and social entrepreneurship education. These new programs aim to connect classroom learning with real world application.

IMSA’s ability to evolve and grow as a thought-leader in STEM education and talent development, with access to the most accomplished educators, cutting-edge technology and a vibrant blend of life and learning, is made possible because of strong public-private partnerships. This is a valuable proposition for IN2 and its educational success will be weighted heavily by the substance of the partnerships we create. We envision several types of partnerships including community, educational, business and entrepreneurial and technology and we are establishing many of these relationships prior to the opening of IN2. Some partnerships have a philanthropic focus while others provide IN2 with cutting edge technology and resources for the users and visitors.

Of utmost importance to IMSA will be those that actively partner with them to support the educational and programmatic elements of student-led and supported entrepreneurial objectives. IN2 provides students with supplementary and supportive educational experiences rarely experienced in today’s classroom. Learners leave IMSA with practical real world experience that strengthen and support them as they continue their educational and work careers.

Plans for IN2 technology include supporting daily educational and collaborative needs for users when working at IMSA, locally and globally, as well as rapid prototyping software and hardware. Contiguous to the IN2 space is access to more specialized manufacturing equipment that must be used in a controlled environment. Some of our technology partnerships under development may lead to opportunities to showcase new and emerging technology for education or business and/or product development.

REINVENTING THE BUSINESS OF EDUCATION

It is time to shake up our concept of school and reinvent the business of education. School cannot simply remain the same; to do so is a failure to prepare our future workforce. The gap between next generation learners and a traditional learning environment widens while we do nothing. IMSA, Illinois’ learning laboratory, is breaking new ground to create the next generation of innovators.

Footnotes:
1. Jim Turmo, presentation given to IMSA IN2 Intersession, Rockford, IL, January 12, 2016.