USING PRIZES AND PULL MECHANISMS TO BOOST LEARNING

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DIGITAL LEARNING NOW SMART SERIES
This is the twelfth paper in a series of interactive papers that provides specific guidance regarding the adoption of Common Core State Standards and the shift to personal digital learning.

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We are only just beginning to realize the potential for prizes to mobilize global expertise and accelerate innovation in education. This paper, adapted from a March 2014 response to a White House Request For Information (RFI), outlines ways that pull mechanisms could be used to encourage investment and innovation in categories not receiving sufficient attention—with the ultimate goal of accelerating the development of high-impact learning technologies.

In healthy markets, participants respond to incentives, invest in research and development (R&D) and produce new innovations. Capital investments bring productivity to scale. In underdeveloped or inefficient markets, customers have few choices, often controlled by bureaucratic mechanisms rather than market mechanisms, and there is little investment in R&D. Underdeveloped markets suffering from a lack of investment and innovation can be addressed through direct investment (return-seeking or philanthropic) by advocating for better policies, or through pull mechanisms.

Direct investments, like foundation grants, can carefully target a specific outcome for a specific audience. They are often crafted by a few wise elders and paid up front without the benefit of any leverage. In contrast to traditional (push) strategies, pull mechanisms have the potential to leverage the expertise and resources of a community; they may also be constructed in such a way that the majority of investment can be based on success.

The four typical pull mechanisms include:

- **Market development**: aggregated demand and advance market commitments;
- **Fast track policies**: cutting through the bureaucracy with accelerated approvals and proactive incentives;
- **Inducement prizes**: rewards for successfully meeting a breakthrough challenge or outcome; and
- **Leveling the playing field**: creating a level regulatory space that invites non-traditional players to participate and offer solutions.

**Market development.** The most common pull mechanism is the broad category of efforts to improve market efficiency by organizing buyers or addressing blockages. By aggregating demand, market facilitators seek better access to inexpensive supply. In global health, advance market commitments (AMCs) guarantee purchase commitments for drugs over a period of time. The increased certainty enables drug manufacturers to make investments to deliver drugs or even develop new ones. In a recent paper, Smart Series Guide to EdTech Procurement, the authors described how aggregated purchasing is saving time and money for school districts.

**Prizes.** Inducement (or incentive) prizes are routinely used to promote private and public benefit. While awards recognize prior achievement, prizes induce future actions. Grants sponsor identified work by a named beneficiary, while prizes have the potential to mobilize an army of experts to work on a problem—and they only get paid if they achieve the goal.
Prizes can also be effective mechanisms to cultivate innovations by creating the financial incentives needed to attract a broad array of competing innovators. They also can be more efficient in the sense that prize funding is only awarded when certain criteria are met. So the funders pay only for the output, not the inputs with the hope of a breakthrough.

There are no “silver bullets” in education, but targeted incentives for innovation, like last year’s Hewlett-sponsored essay scoring competitions can mobilize talent and resources to improve access and quality. Prizes could be used to boost literacy, middle grade math achievement, and language acquisition. Prizes could similarly be used to analyze big data sets and produce useful algorithms.

While not an exhaustive list, there are four types of prizes that could prove to be useful in education.

• **Design Prizes**: small prizes could be used to incentivize innovative designs for new schools, new school facilities, or new systems of education.

• **Intervention Challenges**: products, services, and strategies could be tested in comparable short cycle trials.

• **Data Competitions**: inviting data scientists globally to work on well-defined problems.

• **Geo-Competitions**: inviting districts, cities or regions to compete on specific challenges over a specific period of time or to achieve a certain outcome.

A successful prize draws attention to a problem or opportunity, mobilizes significant resources and solves the problem—or at least illustrates the path forward.

This paper explores the following questions related to the potential of prizes and pull mechanisms to boost learning:

• What learning outcomes would be good candidates for the focus of a pull mechanism to catalyze the creation and use of new learning technology? How are these learning outcomes currently measured and assessed?

• What changes in public policy would facilitate experimentation with pull mechanisms at different levels of government?

• What role might different stakeholders (e.g., federal agencies, state and local educational agencies, foundations, researchers, practitioners, companies, investors or non-profit organizations) play in designing, funding and implementing a pull mechanism for learning technology? What role would your organization be willing to play?
The development of new learning tools creates the opportunity to expand access to quality education, but the shift is complicated and multilayered—print to digital, cohort to personalized, and time-bound to competency-based. Public education has simply evolved over a century, rather than being specifically designed for the new task of helping all students leave prepared for college and careers.

The daunting challenge of designing new schools and transforming existing schools requires a variety of investment strategies. Direct investment can provide support to capable actors—but they are almost always the usual suspects taking proven pathways. Breaking down barriers, attacking inefficiencies, encouraging innovation and tapping unexpected expertise often requires nontraditional approaches.

The Smart Series, a project of Digital Learning Now, attempts to illuminate the path to personalized digital learning. This paper outlines commonly used pull mechanisms and identifies potential problems that could be efficiently addressed with pull mechanisms.

Pull mechanisms, particularly advanced market commitments (AMCs), have been used successfully in global health. Federal agencies have offered almost 300 incentive prizes on Challenge.gov, providing opportunities for citizen problem solvers to offer novel solutions to a wide array of tough problems.

The White House Office of Science and Technology Policy (OSTP) is staffed by two professionals experienced in the use of prize mechanisms. In January, they issued a request for information (RFI) in an effort to stimulate a “conversation about how pull mechanisms could be used to accelerate the development, evaluation, and adoption of learning technologies.” The RFI notes potential advantages of pull mechanisms including paying only for success, allowing winning solutions to emerge rather than trying to pick them out in advance, and increasing the diversity of potential solutions. OSTP notes that pull mechanisms require “establishing a clear goal and an agreed-upon set of metrics for evaluating progress towards that goal.”

The following table summarizes the differences between push mechanisms, where direct investment is made, and pull mechanisms.

<table>
<thead>
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WHY PULL MECHANISM?

When a problem is well understood and there is a clear solution path, direct investment in a high capacity team is the best solution. But there are many complex challenges in education for which the solution set is unclear or at least multidimensional. In these cases, pull mechanisms can be a useful crowdsourcing approach to problem solving.

Efficient markets support investments in research and reward capital expenditures in scaling innovations. The market in which American education exists, however, is highly decentralized with no incentives for productivity and little capacity (financial, human capital or information systems) to make and manage productivity-seeking capital expenditures. These conditions suggest that market development strategies (e.g., pull mechanisms, aggregated purchasing) could be useful to increase the efficiency of the market in supporting the shift to personal digital learning.

Pull mechanisms develop markets where there is insufficient demand or inefficiencies that dampen R&D spending and innovation. As noted by the Global Health Technologies Coalition, “Pull mechanisms help overcome this barrier by creating or securing a market” and “are more appropriate for use in the later stages of R&D. The pull often provides the incentive to get products over the finish line.”

The Smart Series Guide to EdTech Procurement describes the way in which prizes could be applied to move procurement beyond the traditional RFP, explaining that prizes differ in that they require delivery of specific results, with payout dependent upon solving the stated problem or meeting outcome metrics. The Guide also points to talent pool advantages associated with prizes that bring the attention of a wide range of potential problem-solvers to the challenge who might not otherwise be engaged in tackling solutions.

As McKinsey & Company has explained, “[a] rule of thumb holds that prizes are useful tools for solving problems for which the objective is clear, but the way to achieve it is not.”

There is a rich and long history of the use of prizes to solve intractable problems with breakthrough innovations. In the early 18th century, the British Parliament offered £20,000 (more than $1 million U.S. today) to anyone who could solve the problem of calculating longitude at sea. The answer did not come from the expected set of experts or academic elite from that day, but instead from a little-known, self-educated clockmaker named John Harrison who invented a device that became the precursor to the chronometer. Similarly, Napoleon’s need to feed his army spurred a prize. A confectioner Nicolas François Appert won the prize by devising a method that led to the innovation of canning food. And it was a $25,000 prize that not only drove Charles Lindbergh to make the first trans-Atlantic flight, but to do so with an engine design that defied the conventional wisdom.

Prizes enjoy wide bipartisan support ranging from former house Speaker Newt Gingrich discussing them as far back as 2002, and more recently, President Obama. In 2010, the reauthorization of the America COMPETES Act included language giving all government agencies legal authority to sponsor prizes of up to $50 million.
States and districts should also explore the relatively new financing mechanism of Social Impact Bonds (sometimes called a Pay for Success Bond), which allows public agencies to partner with innovative providers and permits other investors or philanthropies to cover the upfront costs and assume performance risk.

Under these models, a government entity contracts with a private sector intermediary to secure a specific set of services aimed at improving an outcome for a targeted population. The government pays the intermediary only upon achievement of specific outcome performance targets. If the intermediary fails to achieve the minimum target, the government does not pay. As a result, the model helps to ensure that taxpayers will not pay for programs unless they demonstrate success in achieving the desired outcomes.

The model shifts the role of the government from identifying potential winners to instead only paying for those

This is a new and emerging area that could offer government agencies and even districts opportunities to explore new service arrangements.

LESSONS FROM ASAP

Last year, sponsors of the Automated Student Assessment Prize (ASAP) published a case study that highlighted lessons from the ASAP competition.

Prizes are an efficient mechanism for focusing and accelerating innovation and automated scoring of student essays is fast, accurate, and affordable—those are two conclusions drawn from prize competitions sponsored by the William and Flora Hewlett Foundation in 2012. The Automated Student Assessment Prize (ASAP) demonstrated current capabilities and mobilized global talent to accelerate innovation in writing assessment.

ASAP began in February of 2012 with a demonstration of capabilities of the eight largest testing vendors. The “bake off” was hosted on the Kaggle platform and, as Mark Shermis and Ben Hamner reported, demonstrated that scoring engines could match expert graders across eight sets of essays.

Next was an invitation to data scientists worldwide to try to beat the best and win part of a $100,000 purse. None of the team members had a background in education. The competition drew more than 2,500 entries and 250 participants and inspired data scientists to develop innovative, accurate ways to improve on the current standard of essay-scoring technology.

The level and diversity of talent mobilized was extraordinary—an actuary in Singapore, a weather scientist in Washington, a teaching assistant in Slovenia, and a geologist in Canada, just to name a few. In 60 days, more than 20 teams had topped the best performance of the vendor demonstration. Jason Tigg, the British particle physicist turned high frequency trader who was a member of the first place team said, “I enjoyed working on a real-life problem that has the potential to revolutionize the way education is delivered.” ASAP Phase Two took on the more difficult challenge of scoring short-form constructed responses (short answers). Luis Tandalla, a college student from Ecuador, won the $50,000 first prize a year after taking Andrew Ng’s machine scoring MOOCs.

The ASAP case study reported five conclusions:

1. A sequence of small, targeted prizes can focus and accelerate innovation in a discrete category.
2. Learning and talent are global; good prizes mobilize global expertise.
3. Crowdsourcing works. Young men (yes, it still unfortunately is mostly young men) from Slovenia to Singapore, from Pittsburgh to Poland poured 100 hours a week into the competition hoping to see their name creep up the leaderboard.
4. Most innovation is translational—something that worked in one field may work in another. Prizes are a super-efficient means of promoting translational innovation.
5. In Phase Two, competitors were required to open source their code (GPLv3 license) along with an instruction manual; there was no drop off in participation from the Phase One, in which competitors were able to retain their intellectual property, suggesting that the data world is becoming more open.
The two phases of ASAP established standards for the utilization of assessment technologies, advanced the field of machine scoring in the application of student assessment, and introduced new players with different and disruptive approaches to the field. Accordingly, the case study identified four benefits of well-constructed prizes, noting that such prizes have the potential to:

- **Leverage funds.** Prizes motivate participants to invest time and energy in solving a problem they might not otherwise consider. Prizes are usually performance-based and only paid out once a viable solution is demonstrated.

- **Mobilize talent.** Prizes spark the interest of diverse groups of professionals and students. Many prizes are won by scientists several degrees of separation from the subject sector. Prizes are an extremely efficient strategy for mobilizing diverse talent that may be impossible to locate using conventional approaches.

- **Innovate.** The cross-pollination of participants from different backgrounds and with different skill sets unleashes creativity, allowing problem solvers to generate fresh ideas. The use of leader boards and discussion tools promotes transparency and competition, but it also inspires collaboration and innovative discovery.

- **Influence.** The results of prize competitions can garner public attention and influence key decision makers. Good prizes result in newsworthy mobilization and breakthrough outcomes that result in press coverage that can be worth more than the prize purse.\(^9\)
Pull mechanisms, particularly inducement prizes, benefit from clear, measurable outcomes. The fundamental importance of literacy and numeracy and the reasonably well-developed ability to measure gains in these areas make them a priority for consideration.

Math. Many experts point to understanding and manipulating fractions as the big pre-algebra hurdle. Additionally, Matthew Peterson of the MIND Research Institute notes that “place value is a major sticking point that often goes unfixed through high school.” Fractions and place value are sufficiently discrete that goals for inducement prizes could easily be set for a “bake-off” style competition.

Peterson adds, “The ability to use math to model situations is one of the most important algebraic abilities and stumps most students.” It could also stump prize developers; it could be approached as an application challenge with expert review (e.g., NYC Gap App Challenge) or as an algebra competition using traditional measures of success along with a student survey.

Peterson’s suggestion about math modeling points to the central challenge of successful prize development—a well-articulated and compelling goal with accurate metrics. Traditional metrics often fail to capture the benefit of a breakthrough innovation. Some prizes need to invent new metrics to gauge desired performance (e.g., the Automotive X Prize used the 100 miles per gallon equivalent to compare multiple fuel sources). The following list outlines concepts that can be difficult to teach and may be candidates for intervention challenges.

20 crucial math concepts that can be difficult to teach:10

1. Place Value and Base Ten Concepts
2. Understanding Fractions as Numbers
3. Regrouping in Multi-Digit Addition and Subtraction
4. Arithmetic with fractions
5. Sets of Numbers and the Real Number Line
6. Inverse Operations and Relationships between Operators
7. Arithmetic with Negative Numbers
8. Revealing the Importance of Properties of Operations for Expression Manipulation
9. Rates of Change and Linear, Quadratic and Exponential Growth
10. Conceptual Understanding of the Long Division Algorithm
11. Developing Proportional Reasoning
12. Solving Inequalities with Absolute Value
13. Solving Linear and Quadratic Equations and Systems
14. Logical Reasoning—Inductive vs. Deductive Reasoning
15. Solving Systems of Inequalities
16. The Meaning of Equality and the Equals Symbol
17. Factoring Polynomials and Completing the Square
18. Graphing Transformations of Functions
19. Increasing Persistence and Creativity for Non-routine Problem Solving
20. Developing Number Sense and Estimation Skills
Literacy. The U.S. Agency for International Development (USAID) recently announced a second round of funding for All Children Reading: A Grand Challenge for Development, a global grant and prize competition seeking innovative ideas that leverage the transformative power of technology to leapfrog existing infrastructure challenges and empower children to read. Specifically, Round 2 “seeks technology-based innovations that support improvements in basic reading skills with a focus on mother tongue instruction and reading materials, family and community engagement, and children with disabilities.”

A previous round of this program has already started to produce results:

- **World Reader:** San Francisco-based company using e-readers in Ghanaian primary schools to improve child literacy and close the gender gap.

- **Planet Read:** The simple idea of subtitling content in the same language as the audio, whether on TV programs, film songs, music-videos, folk songs or movies. They are currently implementing the project in India using Bollywood films.

- **Sesame Workshop India:** Elmo is helping kids to read in Bihar, one of the poorest areas in India. The program integrates proven multisensory approaches, Sesame Street content and ultra-low cost tablets to improve reading skills in Hindi and English. The program also empowers teachers through useful training materials.

USAID is also awarding a $100,000 prize to the organization or individual that develops a software solution to help writers create reading materials in local languages for children in developing countries.

Writing. According to the Pearson R&D team, another outcome that could be a good candidate for the focus of a pull mechanism is academic writing. They explain, “With regard to academic writing, our experience in large-scale assessment suggests students struggle with the sort of analytic writing (e.g., synthesizing evidence, weighing competing claims) that workplace success in a 21st-century economy demands. Other organizations have observed similar patterns.” Academic writing in large-scale assessment is currently measured through periodic end-of-year assessments that might occur once within a grade cluster (elementary, middle and high school). Additional measures of academic writing are conducted through classroom assessment throughout the school year. Although writing may be evaluated as a component of English Language Arts (ELA), scoring written compositions is a costly proposition (especially when it is completed manually) and many states are assessing it infrequently or not assessing it at all. In addition, the process of assessing writing in the classroom can be burdensome and time-consuming for the teacher. As a result, the focus writing receives in academic instruction and assessment is far less than what is merited.

Although many technologies exist which seek to make instruction and assessment of writing less burdensome and costly for schools as well as more authentic for students, they are often implemented piecemeal and are not packaged together into a coherent and focused cross-grade strategy. A pull mechanism in this area would be ideal to incentivize an integrated digital approach to academic writing instruction and assessment throughout a student’s K-12 academic career. This approach should leverage existing technologies such as writing apps delivered to student devices and automated scoring and feedback. It should include collaborative writing activities, which leverage peer review as a means of crowdsourcing the feedback. Students should be encouraged to write for different audiences and purposes and should have authentic writing experiences. The goal should be to increase the overall frequency and quality of student writing using detailed and real-time feedback. Other areas that could benefit from the use of pull mechanisms include persuasive and analytical writing.

Student engagement. The Pearson R&D team also believes student engagement and ownership of their learning would make an interesting focus for a pull mechanism. It is widely acknowledged that the level of student engagement plays a significant role in academic accomplishment beyond raw academic talent. It is also widely acknowledged that students are bored and that classroom instructional practice has not kept up with innovations in technology and learning science.

But student engagement is not often directly assessed, and when it is, it is typically done through survey or other self-report measures. However, its effects are apparent in academic performance, such as incomplete or random responses on assignments or assessments. Student
engagement is not easy to measure in a reliable way and methods for “teaching” students to be engaged are nascent at best. This is an often overlooked, but critical, element to academic success, and it does not receive focus because it is not easy to address. It is, therefore, an especially good opportunity for a pull mechanism.

For example, a pull mechanism could be used to incentivize the development of a student-oriented app that mines data from student work products to provide real-time feedback about how student academic performance, behaviors (i.e., study skills), social interactions/collaborations, and attitudes impact their overall level of academic preparedness. This app should enable easy, frequent and convenient monitoring of information pulled from a variety of digital sources. It should offer game- and puzzle-like incentives such as badges, achievements and other status awards. It should also embed important privacy protections to ensure the student data is not used inappropriately. Finally, it should offer concrete steps for students to follow to achieve desired outcomes. The challenge of improving student engagement should not fall to educators alone. Students will be most engaged when they are partners in their own educational process and have ownership for how their behaviors impact outcomes.

Other options. There are a number of other areas in which pull mechanisms could “move the needle.” College and career readiness, accountability, student guidance and English language acquisition are four additional possibilities that are ripe for more exploration. For example, a prize competition could be used to redesign school and state report cards to better inform parents and students of progress and achievement. The U.S. Department of Health and Human services conducted a similar design competition for electronic medical records and found that a modest prize attracted more than 200 submissions offering much more intuitive, compelling visualizations of the data and information.
Prizes in education could be organized in a number of different ways in order to best serve the ultimate goals set forth by the sponsoring organization. Four potential prize types are described in this section.

**DESIGN PRIZES**

Small prizes could be used to incentivize innovative designs for new schools, new school facilities or new systems of education. The NYC Schools Gap App Challenge focused on middle grade math. Winners received $50,000 in cash prizes, as well as $54,000 in Amazon Web Service Credits, and became eligible to be considered for a pilot program in iZone schools supported by Amazon Web Services consulting services. The iZone schools are a collection of 250 innovative New York City public schools committed to personalizing learning for every student. An expert panel reviewed the applications.

Just as the HHS prize has encouraged innovation in area of Public Health, there are a number of other possibilities for the ways in which prizes could be expanded to address broader issues:

- $100,000 prize purse for innovative school model and platform combinations
- $100,000 prize purse for innovative network design (see recent post on networks) with chance for follow-on investment
- $100,000 prize purse for design of a micro-credentialing (i.e., badge) system to manage matriculation of secondary students (and replace a course and credits system)

**INTERVENTION CHALLENGES**

Intervention challenges would allow products, services and strategies to be tested in comparable short cycle trials.

An interesting and rather complex challenge is the recently launched Robin Hood Prize: Creating College Success. This $5 million prize competition will reward the development of innovative technologies that increase academic achievement among community college students, particularly those in developmental education courses. Payouts will be made for hitting one-, two- and three-year benchmarks.

Three examples of possible intervention challenges include:

- A prize purse of $1 million could be awarded to the best math interventions with a minimum threshold of one year gain (on average) during a six-week summer school.
- A prize purse of $10 million could be split among schools and vendors after a 12-month writing challenge incorporating innovation such as automated scoring, peer review, blogging, portfolio, grammar aid and other writing supports.
- Short cycle trials (of perhaps a semester) could be added to a competition like the NYC Schools Gap App Challenge focused on middle grade math, resulting in a prize of $100,000 and/or purchase commitment.
DATA COMPETITIONS

Data competitions could engage data scientists globally to work on well-defined problems. A warehouse of data on each student could unleash the power of predictive analytics to empower teachers to personalize learning in new and powerful ways. Prizes will accelerate innovation in analytics.

Examples:

• Invite scientists to develop a useful predictive algorithm from the keystroke data of 1,000 students collected over one or two years. The competition could target a single subject or focus on other outcomes such as persistence.

• Facebook and the Bill & Melinda Gates Foundation have hosted several “HackEd” events which aim to bring together EdTech advocates, top-shelf technologists and education experts to solve mission-critical problems in education systems around the world. Groups explore how to use data and the Facebook platform to solve a number of challenges students face with navigating college applications, enrollment and persistence.

GEO-COMPETITIONS

Geo-competitions would invite districts, cities or regions to compete on specific challenges over a specific period of time. Regional challenges may be useful when there are multiple pathways to better outcomes and broad mobilization is likely to be key.

Examples:

• $10 million purse for the city with the biggest gain in literacy of 5-year-olds (or English Language Learners, college-ready grads or another chosen group).

• Take a portion of the School Improvement Grant funding and use it to provide awards for those districts that could achieve a particular goal (e.g., bring all students to third grade reading proficiency, achieve more than 1 1/2 years of gains for all students or achieve a graduation rate of 100 percent.

It may even be possible to use prizes to promote character development and career readiness skills. The keys, as with every prize, would be a compelling goal statement, thoughtful metrics and a well-developed assessment process.

In March the Robin Hood Foundation announced a $5 million College Success Prize, a multistage initiative combining a design challenge and an intervention prize. Consultants for the foundation are providing advice to applicants on interventions, which are likely to include mobile applications and support services. Up to 20 semi-finalists, to be announced in July, will receive additional financial and design support. Three finalists will be announced in January and a three-year evaluation will be launched. The participant with the best outcomes will receive an additional $3.5 million in 2018.
A number of considerations come into play when exploring the potential of prizes to impact education. This section describes the trend of market development, the role of policy and the importance of stakeholder involvement.

**MARKET DEVELOPMENT**

The **League of Innovative Schools**, an initiative of Digital Promise, is a national coalition of 40 public school districts and education agencies in 24 states that collectively serve nearly three million students. The League “connects districts and schools with top universities and entrepreneurs, building a hotbed of innovation where we can demonstrate promising ideas, evaluate them rigorously and rapidly, and replicate what works—accelerating the pace of change in public education.” The League’s stated market development activities include efforts to break down silos, scale innovation, and transform the market by streamlining procurement, aligning supply and demand and focusing the decisions of purchasers.

**Social Impact Bonds.** There has been some recent innovation in social impact bonds, which are “a contract with the public sector in which a commitment is made to pay for improved social outcomes that result in public sector savings. This form of financing allows the government to partner with innovative and effective service providers and, if necessary, private foundations or other investors willing to cover the upfront costs and assume performance risk to expand promising programs, while assuring that taxpayers will not pay for the programs unless they demonstrate success in achieving the desired outcomes.”

New York and Massachusetts have issued impact bonds to invest in rehabilitating the incarcerated and achieve a savings from lower recidivism.

Impact bonds could be (and occasionally have been) used for any hypothesis leading to learning that is likely to result in increased wages or reduced costs. Examples of possible uses include:

- Early childhood interventions/opportunities,
- Dropout prevention/recovery,
- Improvement of family support services,
- Multidimensional foster care treatment, and
- Education of adjudicated youth.

TABLE: SOCIAL IMPACT BOND DEVELOPMENT PROCESS

1. **Determining whether SIBs are a Good Fit for Your Organization**
   - Enthusiasm and commitment among leadership
   - A realistic possibility of taking a successful initiative to scale
   - Alignment with other performance goals
   - Sufficient interest from investors

2. **Selecting a Suitable Policy**
   - **Sources of Initial Ideas**
     - Internal government discussions
     - Informal conversations
     - Lists of programs with successful program evaluations
     - A formal “request for information”
   - **Criteria for Filtering Ideas**
     - Priority policies
     - Strong agency leadership
     - Potential for high net benefits
     - Technically feasible

3. **Navigating the Development Process**
   - **Data Analysis Tasks**
     - Match administrative data sets
     - Analyze historical baselines
     - Choose target population
     - Analyze historical performance of specific providers
     - Conduct analysis necessary to develop evaluation methodology
   - **Financial Modeling Tasks**
     - Conduct a benefit-cost analysis
     - Build a model of payment schedule options
     - Develop a financial cash flow model for the project
   - **Structural Tasks**
     - Begin initial engagement with potential partners
     - Obtain authority from the legislature
     - Undertake a procurement process to engage services of an intermediary
     - Undertake a process to engage services of providers
     - Hire an independent evaluatory

4. **Putting All the Pieces Together**
   - Negotiate payment terms
   - Support the intermediary as it raises private capital
   - Develop operating procedures
   - Draft and execute contract
   - Establish plan for making decisions about scaling/expanding

5. **Implementing and Monitoring**
   - Monitoring and oversight
   - Field office support
   - Evaluation support

6. **Wrapping Up**
   - Final determination of outcomes and payments
   - Interpreting the results
   - Decision about follow-on contracts

POLICY

One strategy used for years to help secure better pricing is cooperative purchasing, in which demand is aggregated and then bid out on behalf of the participants. State and federal policy should incentivize aggregating demand in order to provide stronger business cases that would increase the number of providers, lower costs and encourage faster deployment of services.

For example, the Federal Communication Commission’s (FCC) schools and libraries universal service support program, commonly known as the E-rate program, currently has a number of elements that create an inadvertent bias against consortia, including average application wait periods that can exceed more than 290 days. A coalition consisting of the Council of Chief State School Officers, the Foundation for Excellence In Education, the Alliance for Excellence in Education, the National Alliance for Public Charter Schools, the International Association for K-12 Online Learning (iNACOL), the Clay Christensen Institute, the Knowledge Alliance and Chiefs for Change has encouraged the FCC to eliminate existing disincentives to consortium participation by simplifying and streamlining consortium application processing, including prioritized review by dedicated review personnel. Going forward, the FCC should prioritize consortium funding and provide an additional five percent consortium-specific discount.

Incentivizing cooperative purchasing of broadband is one of the few proven ways to not only secure better pricing but also build the demand business case providers need in order to justify the upfront capital costs for building out new services.

It is also worth considering creating better metrics to gauge the efficiency and effectiveness of procurement processes or pull mechanisms. One way to begin building better metrics might be to use a version of the World Bank’s Doing Business study, which presents an annual detailed analysis of costs, requirements and procedures to which a specific type of private firm is subject to in various countries. A similar method could be used to gauge how “innovation-friendly” state and district procurement and regulatory environments are to innovators. Asking education providers (e.g., charter school Chief Marketing Officers, online course providers, publishers, education start-ups) questions about the number of steps and length of time for their charter school approval or procurement processes, the length of the average RFP, the cost of securing a contract or complying with regulations would do two things: First, it would provide more information to suppliers to help prioritize sales opportunities and allocate scarce resources. Second, it would provide new benchmarks for policymakers to improve upon, just as the World Bank found that countries launched reform strategies to reduce the steps and complexity of their business regulations.

Finally, state and federal government needs to create a level playing field for solution providers. There is a tremendous disconnect between the way federal policy approaches most social challenges and the way it approaches challenges in education. Government policy has traditionally supported efforts to engage the private sector in solving some of the most challenging and intractable social challenges outside of education. Policymakers make use of a number of policy tools, including grants, loans, loan guarantees and tax credits, to both incentivize private sector engagement and stimulate consumer demand for new solutions and innovations. The underlying premise behind these policies is that there is a public good that results from attracting private sector entrepreneurs to tackle pressing public challenges.

While the same premise exists with education challenges, state and federal policy has taken the opposite posture with respect to education challenges. Instead of engaging the private sector, policymakers actually create policy and funding barriers that skew support to nonprofits and prevent for-profit entities from participating in programs aimed at improving teaching or learning. For example, the Investing in Innovation Fund (I3) shuts out private entities in a way that is entirely inconsistent with the innovation funding approaches at NASA, the U.S. Department of Energy and the U.S. Department of Health and Human Services. As a result, nonprofits could receive up to $50 million in direct federal support from I3, while for-profit entities may be required to go through lengthy procurement processes with a school district or nonprofit entity, or to operate as a subcontractor, in order to be awarded typically modest sums only after a grant is awarded.
This uneven playing field creates disincentives for new approaches, innovators and experts to engage on some of the most pressing education challenges facing our country. The same policy and competitions that led to the U.S. government using SpaceX and pursuing new energy innovations should be brought to bear on education.

A good example of policy encouraging innovation can be seen in the Millennium Challenge Corporation, which has redefined the way foreign economic assistance is provided. The initiative uses a competitive selection process to demonstrate positive performance in three areas: ruling justly, investing in people and fostering economic freedom. The competitive process rewards countries for past actions measured by objective performance indicators—essentially those countries that make the commitment and progress needed as a precondition to ensure foreign aid is maximized.
CONCLUSION

While mega-prizes have helped to break open targeted industries such as space exploration and other technical fields, they have not been common in education. As has been true in the fields of chemistry, material sciences and data analytics, a sequence of small, targeted prizes appears to be a promising strategy to produce focused innovations in education.

Prizes work best when the problem is well defined, metrics are quantifiable and not in dispute, and there is a market path to take the innovation to scale.

It is important to remember, “Inducement prizes and AMCs cannot substitute for robust research funding, protection of intellectual property, and development of a world-class workforce, but they can be a powerful complement to those efforts.”

As the authors of “Boosting Impact” contend:

The stage is set for the biggest impact investing opportunity in history. New tools and new learning models have demonstrated the potential to boost achievement…and extend access to quality learning, particularly secondary education, for hundreds of millions of young people in developing economies. By the end of the decade—where politics and scaling investments allow—it will be possible to offer every young person on earth a quality education.
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DISCLOSURES

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ENDNOTES

1. Adapted from materials from the Global Health Technologies Coalition, found at http://www.ghtcoalition.org/incentives-pull.php.
4. Ibid.
5. Ibid.
8. Sections from this case study have been adapted for use in this paper. The full case study may be found at http://cdn3.gettingsmart.com/wp-content/uploads/2013/02/ASAP-Case-Study-FINAL.pdf.
13. Ibid.