Published on *Penn GSE Perspectives on Urban Education* (https://urbanedjournal.gse.upenn.edu)

EDUCATIONAL ECOSYSTEMS: A TREND IN URBAN EDUCATIONAL INNOVATION

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Abstract:
There is an increasing reliance on market principles and values in the education space, particularly in urban contexts, accompanied by a growing diversification of educational service providers. Due in part to increased interactivity amongst constituents in this growing assembly of providers and actors, educational innovation ecosystem arrangements have emerged across urban centers. In this article, we present and define the concept of educational innovation ecosystems: The concept is discussed generally as a product of an increased market emphasis in the education sector and more specifically as a product of public-private partnerships. The concept is further exemplified through case examples that offer a perspective on how such arrangements can be of benefit in urban education environments. The article opens with an example of how market logic has been operationalized in some urban centers through a diversification model for providing schooling services. Next, we discuss and provide case examples of educational innovation ecosystems. Finally, we conclude with a discussion of how education technology, as an outgrowth of public-private activity and collaboration, is being designed for pedagogical application in schools.

A Diversification Trend in Education Service Providers

In 2002, the Philadelphia public school system was taken over by the state of Pennsylvania. The school board was dissolved and replaced by the School Reform Commission, which consisted of three gubernatorial appointees and two mayoral appointees. At this time, the district conceived the *diverse provider model*, infusing market principles into the mechanisms through which educational services were secured and provided to students and families in Philadelphia. The diverse provider model entailed a restructuring design that had “45 of the city’s lowest performing schools turned over” to a diversity of education service providers (e.g., charter schools, for-profit firms, reconstituted district schools) (Gill, Zimmer, Christman, & Suzanne, 2007, p. 21). At the time, this was a radical act of urban education reform both in scale and scope.

Due in part to these changes as well as the general arc that urban education reform has taken in Philadelphia, the school district has steadily devolved away from the traditional model in which the district is the sole provider of education toward an emerging diversity of schooling options (e.g., charter schools, cyber schools, home schooling, for-profit education centers). Like Philadelphia, the cities of Chicago, New York, Boston, New Orleans, Washington, D.C., and other urban centers have experienced a similar diversification trend. Increasingly, there is a plurality of voices in the urban education sector exercising more influence than in previous decades. These voices include philanthropic organizations, national charter management organizations, financial investors, and a host of other educational service entities such as education technology (or ed-tech) startups, for-profit education companies, and both research and corporate universities. [1]

But this trend has not been met with complete approval. Some have decried this transition, characterizing these shifts as a type of private sector encroachment on the public’s interest in education. Rather than entertain these criticisms, which have been fully ventilated in other works, [2] the goals of this article are the following: (1) to characterize and reframe the discussion around marketization trends in education as an outgrowth of public-private sector collaboration rather than as an encroachment of one by the other; (2) to define the term *innovation ecosystem*, with some attendance to the origins and application of the term in the education sphere; (3) to present case examples of active innovation ecosystems that are creatively leveraging public-private interaction on behalf of teaching and learning, and (4) to discuss the burgeoning education technology industry that is emerging in the wake of public-private efforts to bring more technology to urban classrooms. The purpose of this article is to highlight examples of positive innovations and developments arising from emerging ecosystem arrangements in multiple urban centers, with the hope that these trends may inform ongoing efforts to facilitate innovation on behalf of students and families in our urban communities.

The Rise of Innovation Ecosystems in Education

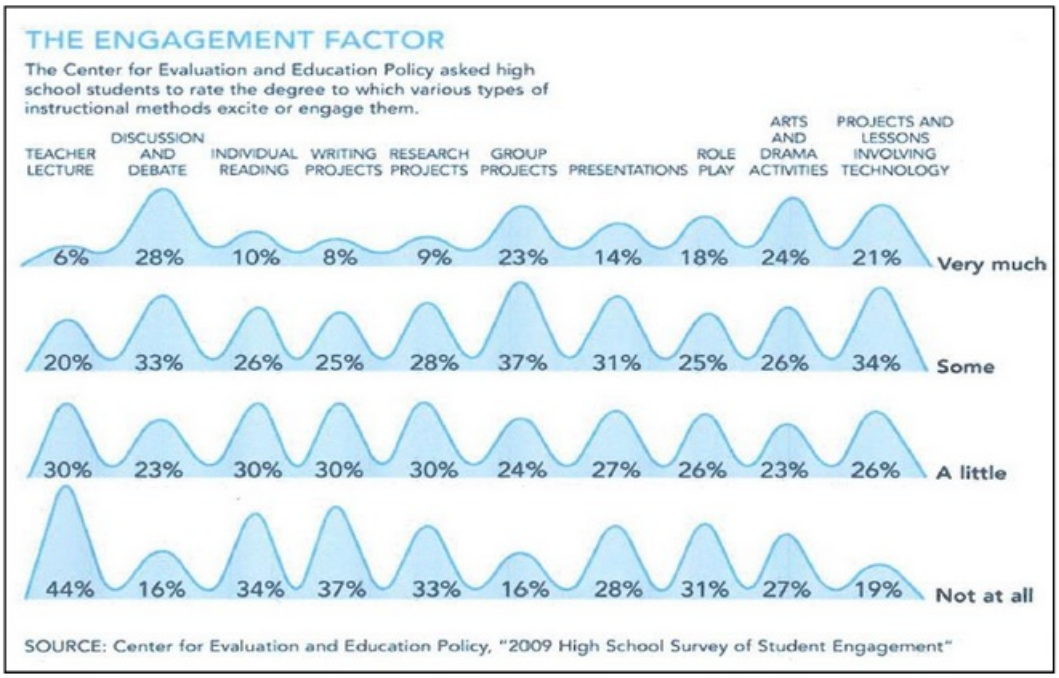
The term *innovation ecosystem* is rooted in the practices and partnerships of technology firms that produce devices for customer use.[3] Due to the context in which the term was developed—business, technology, and industry—it has only recently gained

recognition and application in the education sphere. Innovation ecosystems are complex, cooperative networks among a variety of stakeholders in a particular industry whose collaborative efforts generate new ideas, products, and processes for industry consumers. Innovation ecosystems in the education sector are typically the result of evolving collaborations between schools, philanthropic organizations, and for-profit entities, among others, in which schools seek to procure particular technologies and/or technological services from their partners for the benefit of students.

The increased reliance of public schools on business and technology partnerships may be linked to the role that technology can play in promoting student engagement and enabling pedagogical and organizational innovation. A report by the Center for Evaluation and Education Policy (2009) indicates that classroom projects and lessons involving technology may increase student engagement by as much as 21%. (See Figure 1.) It is not surprising that technology has pedagogical value in schools because schools are consumers rather than producers of technology devices. Innovation ecosystems, which facilitate the acquisition of learning technologies by teachers, parents, and students, may prove instrumental in supporting 21st century learning.

Figure 1

The Engagement Factor



Note. Table reproduced from Rebora (2010).

The increased reliance of public schools on business and technology partnerships may also be an attempt by public institutions to innovate around economic constraints affecting the public sector. Financial exigencies, for example, have prompted some states to reduce their role as the predominant source of fiscal support in K-16 public education. This reduction has created an economic shortfall, but the gap in funding has increasingly been filled by philanthropic and private sector support that helps schools obtain resources and tools that would otherwise not be available to them.

The growth of the education technology industry illustrates how increasing public-private collaboration has emerged to fill an unmet need in urban schools and communities, particularly the demand by consumers—including parents and teachers—for technologies that facilitate instruction (e.g., educational apps). Parents and teachers may use such devices for educational content as well as pedagogical and assessment resources. Ed-tech is discussed in greater detail later in this article. See Figure 2 for a conceptual model of types of public-private interactive and collaborative networks and exchanges emerging in the education space.

Figure 2

Conceptual Framework: Public-Private Sector Interaction and Collaboration for Education

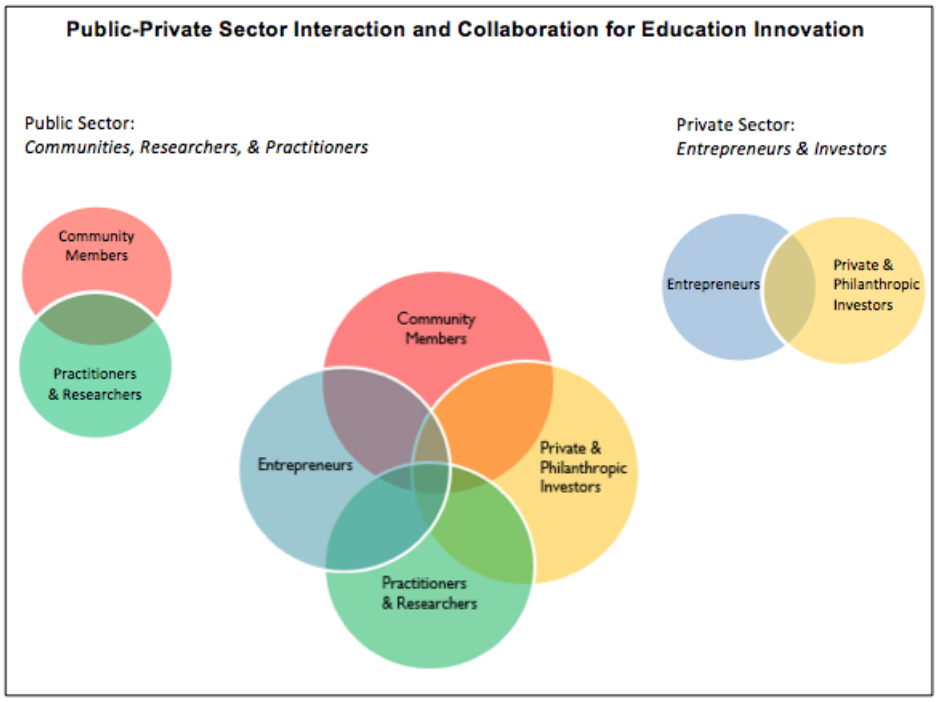


Figure 2 illustrates the diverse partnership arrangements emerging across public and private realms, involving education practitioners, community members, researchers, entrepreneurs, investors, and many others in an increasingly dynamic, collaborative education sector. Historically, innovation in the public education sector has entailed collaborative contribution(s), primarily from public sector groups and constituencies (e.g., educators, students, parents, and community members) for the advancement of communities and schools. Today, collaboration efforts—driven not only by public sector constituencies, but also by entrepreneurs, private sector firms, and foundations—represent a landmark shift of our time.[4]

The Developing Futures in Education Program (DFEP), the *iZone* in New York, and the Education Design Studio, Inc. (EDSi) at the University of Pennsylvania Graduate School of Education are examples of emerging education innovation ecosystems. Together, they illustrate how novel public-private collaborative arrangements are working to develop innovations and take them to scale in the urban education sector. However, it is important to point out that these examples are not panaceas for improving education. As acknowledged above and thoroughly discussed in Ravitch (2010), there may be concerns that have yet to be resolved concerning the future extensity and implications of such arrangements, including scope of regulatory control and political propriety. The description of education ecosystems here is intended only to illustrate that elements of organizational and pedagogical innovation arising at the boundaries between public-private sector collaboration are unique, if not promising. These examples exemplify how such collaboration can augment rather than supplant the public educational mission.

The Developing Futures in Education Program[5]

The Developing Futures in Education Program (DFEP), launched by the General Electric (GE) Foundation, supports education reform efforts in math and science across seven urban school districts where GE has a significant presence: Louisville, KY; Cincinnati, OH; Stamford, CT; Erie, PA; Atlanta, GA; New York City, NY; and Milwaukee, WI. Since its launch, the program has invested more than $200 million in these school districts.

Per their partnership agreement, GE provides teachers and school leaders with access to an online learning management system that provides tools and resources as well as social networking opportunities and discussion forums for educators. The partnership also affords participating schools access to GE resources and collaboration across other domains. In Erie, Pennsylvania, for example, members of GE's Transportation IT department helped the district develop a new IT system that integrates a web-based curriculum and student information system. With the new system, teachers have access to real-time student data 24/7, and the district has generated savings.

As DFEP districts move to implement the Common Core and the National Science Foundation's Next Generation Framework, teachers are able to use the GE learning management system to share ideas with one another at different schools and obtain

peer support and feedback on lesson planning. This strategy helps instructional leaders and teachers develop professional learning communities that function asynchronously and across geographic locations, contributing to student learning in powerful ways. While they are certainly not new to the educational scene, public-private partnership networks like this one are emerging with increasing frequency.

The Innovation Zone (iZone) in New York[6]

The NYC Department of Education (DoE), the largest school district in the United States, created the *iZone*—a subset of 250 K-12 schools that collectively serve 80,000 students—to facilitate the development and implementation of high-impact technology in schools. Participating schools apply to be part of the iZone and are accepted based on criteria that call for: (1) a well-articulated vision of how a school's participation in the iZone would increase student achievement, (2) alignment between the iZone framework for school redesign, (3) innovative leadership, (4) school leadership structures that engage the whole school community, (5) a clear plan that ensures alignment of existing partnerships for a coordinated approach to school improvement, and (6) an expressed intent by the school to share successes and challenges with other schools. [7]

iZone schools serve as a testing ground for education technology apps vetted by the district through an app development competition known as the Gap App Challenge. This competition is hosted by the NYC DoE. Funded by a federal grant, the NYC DoE provides recognition and prize money to early-stage ed-tech companies whose apps score the highest across criteria that track user experience, teacher assessment of feasibility of use, quality of the idea, and the potential impact on student engagement, performance, and assessment. The goal of the Gap App Challenge is to foster collaborative relationships among schools, educators, and ed-tech companies that go beyond the usual customer-vendor relationship to yield robust technologies for classroom use. Taken together, the various partners in this arrangement—the NYC DoE, the federal government through its innovation grant, the myriad for-profit and not-for-profit organizations that compete in the Gap App Challenge, and the many students and educators who vet the apps—comprise a burgeoning educational innovation ecosystem in New York City.

The Education Design Studio, Inc. (EDSi) and the University of Pennsylvania Graduate School of Education

The University of Pennsylvania's Education Design Studio, Inc. (EDSi) is a unique incubator in which a private, not-for-profit university is proactively collaborating with for-profit, early-stage educational ventures by leveraging its research capacity and serving as an interface between stakeholders. Universities are natural centers for research and development, and so they are already equipped to bridge the gap between research and practice. And, as in the case of the University of Pennsylvania, university systems are often uniquely positioned for networking across the private and public realms in a time when the divisions between these domains are becoming less distinct.

Because this incubator, design studio, and seed fund is collaborating with a top-tier research university, participating startups have access not only to traditional incubator resources, but also to education researchers. EDSi's partnership network with Philadelphia K-12 teachers and schools enables entrepreneurs to beta test their products with students, teachers, administrators, and other stakeholders. Products coming from this pipeline have the potential to be most practical and useful for enhancing classroom instruction.

EDSi is open to ventures that emerge as semi-finalists or finalists in the university's education business plan competition[8] such as recent competitors ApprenNet[9] and Raise Labs.[10] ApprenNet leverages the internet and an apprentice-based learning model, providing written and video feedback to teachers on their teaching from peers and experts. Raise Labs offers micro scholarships to high school students, incentivizing behavior that promotes college readiness and preparation. (i.e., Students are awarded monies for good grades, attendance, extracurricular activities, and more, which they may apply toward their college tuition.) New educational companies like ApprenNet and Raise Labs are budding innovation projects in the EDSi ecosystem and are redefining what it means to be a 21st century learning organization.

Designing Educational Technology for Schools

As alluded to above, the growth of the ed-tech industry, particularly when supported by ecosystems like EDSi and the *iZone*, provides another vantage point on how public-private collaboration can inform the development of learning technologies for educational improvement. Within the ed-tech space, technology accelerators and incubators are at the forefront of supporting startup companies in developing educational tools and products.

As of December 2014, there were 88 prominent technology accelerators and incubators focused on innovation in education in the United States alone, with several more poised to enter this rapidly growing arena (Gruber, Consalvo, Davis, & Newman, 2012). Among the ed-tech innovations emerging from these accelerator programs are mobile phone apps for classroom use,

data management systems for schools, interactive communication platforms that allow parents to track their students' progress and communicate with school personnel, e-learning material aligned with Common Core State Standards, and course-creation systems for developing Massive Open Online Course units (MOOCs). These and other education-specific tools and technologies have the potential to fundamentally change the way public education is delivered, enacted, and experienced by students. But there are caveats to this claim; for real innovation to take place in our schools, a paradigm shift must take place, including the following factors:

- **Educators must adopt an innovation mindset.** Educators need to adopt an attitude of embracing and exploiting change, recognizing that doing so is key to the survival and growth of all organizations. This includes an awareness of the economic and political shifts that are driving innovation and change efforts in the public education sector today.
- **Ed-tech entrepreneurs must adopt a pedagogical mindset,** engaging with researchers and educational practitioners and including them in the development process. There is no reason to expect sustained educator buy-in and investment in products that have generated little to no evidence that they are effective in enhancing teaching and learning.

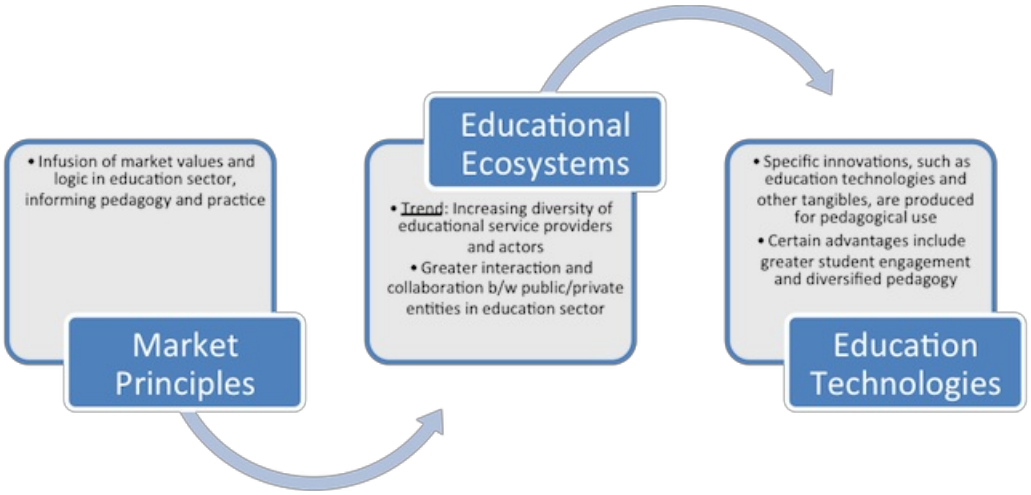
Innovation requires that we take advantage of change. This is key to the survival and growth of organizations regardless of incorporation status (see Conceicao, Gibson, Heitor, & Sirilli, 2001; Bessant, 2005). Institutions of learning are no exception. Changing the way practitioners think about enacting and/or facilitating educational practice could more readily secure innovative growth in the education sector.

A Descriptive Framework for Educational Innovation

Throughout this article, certain ideas have been interrelated: (1) the impetus of market principles in facilitating shifts in urban education contexts, (2) the increasing diversification of education service providers and actors in the education space, (3) educational innovation ecosystem arrangements, and (4) the development of education technologies/innovations for pedagogical use. Figure 3 presents a descriptive framework that exemplifies the interrelationship of these concepts.

Figure 3

A Descriptive Framework for Educational Innovation



An increased reliance on and the operationalization of market principles in urban education environments has facilitated increased interaction between and among public-private actors in the education sector.[11] Educational innovation ecosystems are emerging as a product of this interactivity and further enable specific innovations—such as education technologies—to be produced.

Conclusion

As the educational landscape changes—driven in part by an infusion and operationalization of market principles—to reflect an increasing prevalence of public-private arrangements, innovation ecosystems, and ed-tech novel strategies for improving teaching and learning have emerged. In areas of the country where a dearth of opportunity may preclude access to the best schools and outlets for social and academic advancement, public-private partnerships that innovate around economic

constraints and educational technologies that foster increased student engagement may offer a means for securing the highest quality education for students. Though innovation ecosystems in education and new education technologies are no panacea for the challenges of public education, such opportunities may provide relief for urban communities and educational programs beleaguered by financial hardship and other such struggles.

The advent of programs such as the Developing Futures in Education Program (established across multiple urban centers), the *iZone* in New York, and the Education Design Studio, Inc. in Philadelphia reflect a trend in urban education that leans toward greater collaboration through diverse coalitions in education. This trend could inform the urban education reform movement and, ultimately, the ways in which we teach and learn.

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[1] See Ball & Junemann (2012) for a description of similar change processes underway in the British educational system.

[2] See Ravitch (2010) for a discussion of how education is at risk for privatization.

[3] See Adner (2006), who defines innovation ecosystems as "the collaborative arrangements through which firms combine their individual offerings into a coherent, customer-facing solution." He adds that when innovation ecosystems work, they allow organizations to create value that no single organization could have created alone (p. 2).

[4] See Ravitch (2010) for a discussion of the unprecedented level of foundation influence—what she terms the "Billionaire Boys' Club"—from the mid to late 20th century into the 21st century.

[5] www.gefoundation.com/developing-futures-in-education

[6] www.schools.nyc.gov/community/innovation/izone

[7] See NYC Department of Education (2012) *iZone Selection Criteria*.

[8] See Milken-PennGSE Education Business Plan Competition: http://nestcentral.org/

[9] https://www.apprennet.com/

[10] https://www.raise.me/

[11] See Figure 2 for a representation of entities.

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