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HOW THE PRINCIPLES OF THE SHARING ECONOMY CAN IMPROVE ORGANIZATIONAL PERFORMANCE OF THE US PUBLIC SCHOOL SYSTEM

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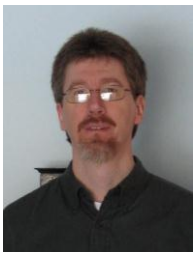

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ABSTRACT

The US public school system is struggling with issues of student achievement. Therefore, the current study will examine education in the context of public goods, identifying three key dimensions of education as public goods and club goods. Then using agency theory, the paper addresses how school districts may be organized into local responsibility centers (RCs), to encourage local participation and better measure performance. The paper also identifies how the collaboration (sharing) economy may offer insight into all of these issues, examining four small case examples of organizations that illustrate the principles of the sharing economy. The paper then develops a proposal for revamping public education, based upon these principles.

Contribution/ Originality: The paper critically reviewed the literature on public goods and club goods, specifically focusing on its application to education. As such, this study contributes to the existing literature by presenting a new way of assessing public education, and therefore develops novel and insightful recommendations on educational reform.

1. PROBLEM AND SCOPE: US PUBLIC EDUCATION SYSTEM

One of the critical issues of public policy and administration is how to ensure the provision of quality education for all (see Paul (2014)). However, the American public school system (K-12) for some time has been demonstrating declining student achievement, compared to its peer countries. In mathematics for example, 29 countries outperformed the US by a statistically significant margin, up from 23 three years prior, reported *Education Week*. In the field of science, 22 locales scored above the US average, up from 18 over the same time period. Finally, in reading, 19 nations scored higher than US students, up from nine in 2009 (Chappell, 2013; Heitin, 2013).

The problem would not seem to be related to the amount of money spent. As a huge economy, the United States has plenty of money to spend on education, if it were a priority. Furthermore, the United States actually does spend the money, whether measured per pupil or in total. Total expenditures for public elementary and secondary schools in the United States amounted to $620 billion in 2013, or over $12K per public school student enrolled (U.S.

Department of Education, 2016). Only four countries, Austria, Luxembourg, Norway and Switzerland, spend more per student on primary and secondary education (OECD, 2014; Sherman, 2015).

However, this spending is not equal throughout the school districts in the US. Because a substantial portion of public school funding (about half) comes from property taxes, and as there are rich communities and poorer communities, there exists a large funding gap (U.S. Department of Education, 2000; Biddle and Berliner, 2002). Among the nation's school districts, annual funding can range from under $4K to over $15K per student (Biddle and Berliner, 2002). This wealth-driven funding system largely defeats the whole purpose of having taxpayer-funded schools in the first place. A traditional argument against having only private schools is that wealthy parents would send their children to the best schools, and as such, their children would always have greater access. Poorer parents would only be able to send their children to second-rate schools, if at all. Therefore, intergenerational wealth would accumulate much faster among the rich. But the current funding system still maintains much of this problem, and politically it would be nearly impossible to cut funding for the top suburban schools, or to raise taxes so significantly to bring all the other schools to funding parity.

Even further, performance of these schools would seem to be rather unimportant to funding decisions. Often times, kids are zoned into schools based on address, not parental choice, and schools receive funding based on the number of enrolled students. So whether a high school has a 30% or a 90% graduation rate may have little or no impact on funding decisions. There have been a few limited attempts to connect funding to choice or performance, such as the Race to the Top (a $4.3 billion competitive grant offered to school districts for implementing reform plans and meeting goals for student outcomes) (U.S. Department of Education, 2015) or the DC Opportunity Scholarship Program (a federally funded school voucher program offering scholarships to 2000 low-income children in Washington DC) (Strauss and Turque, 2008). But these attempts are perceived to have brought too little reform, and still received fierce resistance.

Furthermore, it is exceedingly difficult to measure teacher performance. "Education" is a very difficult construct to operationalize. Standardized tests may not actually measure student learning, certainly not valuable critical thinking skills and creativity. Yet the number of standardized tests students take has exploded in the last decade, with most schools requiring too many tests of unknown value, according to a comprehensive survey on the matter (Layton, 2015). A funding system even partly connected to standardized test scores may encourage 'teaching to the test' rather than investing in more important teaching and learning skills.

Moreover, how public schools are organized into responsibility centers (RCs), is critical to understand. Public schools are cost centers, and as such, are not organized to measure value creation. That is, an organization (such as a corporation) may have revenue centers, cost centers, or profit centers. A revenue center (such as a sales division) focuses on earning revenue, but has no incentive to control costs. A cost center (such as a manufacturing plant) focuses on cost control, but has no incentive to find new ways of creating value. Therefore, most organizations will organize by profit centers (centers measuring local revenue minus costs) if at all possible, as this improves unit accountability. With individual public schools organized as cost centers, many schools often make seemingly counterproductive decisions; such as creating larger class size, consolidating schools, replacing the most experienced teachers with new hires, establishing shorter school years, etc.

Furthermore, the creation of the public school system has created an entrenched professional class. This professional class is well-trained and well-funded, and has all the responsibility of being the providers of education. The implications of this class system are that families outsource education to this professional class, and essentially cede much responsibility to it. Parents increasingly see themselves as customers of the public school system rather than as co-creators of value. A sharp division and almost antagonistic relationship has emerged between the providers (teachers and administrators) and consumers (taxpayers and families) of public education. For any problems, parents blame the teachers and teachers blame the parents.

Taking the separation of the provider class and consumer class to a new level, one further observes a very odd phenomenon. Many politicians making important decisions for public schools, many school administrators, and even some public school teachers, put their own children in private schools (see Wong (2016)). As such they have no skin in the game. The ultimate separation of provider and consumer of education manifests when providers choose not to be consumers of their own product.

So the key question for this study is: How do you measure and improve US public education performance outcomes? Answering this may require utilizing the principles and deploying the kind of technology of the *collaboration economy*, so that public school outcomes may be evaluated and incentivized. This study describes how the collaboration economy may be used to transform public funding of education. As such, in order to understand the nature of public school problems, and the possible reasons behind them, the paper will examine public education in the context of public goods, and then address how school districts may be organized into responsibility centers (RCs). Four examples are presented to illustrate the principles here. Finally, a proposal for revamping public education, based upon this examination, is given.

2. CONCEPTUALIZING EDUCATION AS A PUBLIC GOOD

2.1. Definition

According to Samuelson (1954) a public good is defined as a good that demonstrates *non-rivalry of consumption* and *non-excludability*. Non-rivalry of consumption indicates that if one person consumes (utilizes or enjoys) a good or resource, the total value of that good is not reduced for others. For example, roads are generally considered to be public goods, as driving on a road usually does not reduce its value (except in the case of congestion). Non-excludability indicates that you cannot prevent others from enjoying the good. Once the good is created it is freely available to all, because it is difficult or impossible to charge 'voluntary' user fees to consume the product. National security and street lights are two examples. Once a society invests in making or keeping its nation safe, or installs street lights, it is impossible to stop others from benefitting from these goods.

Of course, a good may also be rivalrous but not excludable - termed common-pool resources; or it could be excludable but not rivalrous - termed club goods. Public goods with benefits restricted to a specific group may be considered club goods. These are goods that are excludable but shared by more people than usually share private goods, but fewer people than usually share public goods. Each new "co-owner" helps reduce the cost of the club good, so there will be some optimal size of the good provision that maximizes their benefit. This arrangement also blurs the distinction between owner (supplier) and consumer of such goods, if the owners also benefit from the provision of these goods (Buchanan, 1965).

2.2. Extensions

2.2.1. Positive Externalities

A related argument for public funding of certain goods, is that the goods demonstrate *positive externalities* (in which case they should be subsidized). That is, for some goods the social benefit may exceed the private benefit. There are positive spillover benefits for society as a whole, beyond the private benefit to the focal individual or unit. In this case, the externalities themselves reflect public goods, as you cannot exclude others or charge them a voluntary user fee, in order to receive the side benefits from those goods. Likewise, benefitting (consuming) from the goods' externalities likely does not substantially reduce the value for others' benefit.

2.2.2. Increasing Returns Industries

This discussion of positive externalities brings us to an interesting phenomenon in some industries, which must be discussed here, as it has important implications for the concept of public goods. In many high tech and knowledge-intensive industries we observe an interesting phenomenon known as increasing returns. In industries

reflecting increasing returns, marginal product increases with the volume of output (i.e., net income per unit increases with volume produced). This likely means *both* that revenue per user is increasing with increased production, and cost per user is decreasing with increased production (Shane, 2009).

According to Shane (2009) there are three reasons for the increasing returns phenomenon. The first reason is cost-driven. With high up-front costs and low marginal costs, unit costs drop as volume increases. This is similar to economies of scale, but is even more dramatic. With economies of scale, there comes a point where there are diseconomies of scale, and unit costs will start increasing again. However for increasing returns industries, the marginal cost keeps declining indefinitely (Yoffie *et al.*, 2006). The second reason, also cost-driven, relates to producer learning. When there are steep learning curves ('learn by doing'), higher volume translates to lower costs (moving down the learning curve). Lower marginal costs mean increased marginal profit.

The third reason is revenue-driven, and relates to positive network externalities. In this case, the purchase of a product by a new customer (user) creates additional value for existing customers. (Social media sites reflect this phenomenon: A greater number of users indicates greater total value for the whole network. Therefore, as a firm brings in more users, they can raise prices.) Another example would be a computer operating system, particularly an open source system such as Linux. More developers (suppliers) leads to more users (customers), which then leads to more developers (as there are more applications and more contributors). These positive network externalities may be direct effects or indirect effects. Direct effects (driven by the direct interaction by users) demonstrate greater than linear growth with a greater number of users (total value grows higher than cost). For example, with additional telephone or Internet users, the number of connections between users grows disproportionately to the percent increase in users. Indirect effects come from the presence of complementary products - products that are used along with the focal product, increasing the value of the total product platform.

In terms of public goods, this phenomenon brings a new take on the issue of non-rivalry of consumption (where consuming a public good does not reduce its value for other potential consumers / citizens). Here, "consuming" a product actually *increases* its total value (due to the aforementioned positive network externalities). This is better than non-rivalry of consumption. Not only do "consumers" not consume, they actually produce.

2.2.3. Applicability of Education

So how does education fit these public goods concepts? It depends on what we mean by "education". Education means many disparate things, and reflects the above concepts differently. What specific aspects (or transactions) are we addressing when we talk about education? First, non-excludability is irrelevant to education. It is easy to exclude participants by charging tuition or placement fees, but may not be advisable to do so. Non-rivalry of consumption (and relatedly the issue of externalities) is the critical issue. Accordingly, we can divide education into three key parts: *traditional classroom education*, *a standardized core*, and *network education systems*.

Traditional classroom education is not a public good (though it may show positive externalities), rather it is more reflective of a club good (Buchanan, 1965). Proof is demonstrated by schools capping enrollment and advocating smaller class size. A larger class means that there are more consumers (students), which lowers the total value of the education product. There is a negative effect related to class congestion, as over-sized classes have less personal interaction and accountability. That is, consumers (additional students) actually do "consume" the total value of the product education (i.e., reduce its value for existing students).

The second part of education relates to a standardized core. We see attempts to standardize the curriculum and methods of teaching, in order to improve quality and reduce its variability. An example is The Common Core State Standards Initiative (2016). We also see many recorded lectures being made freely available to anyone. A recorded lecture is a public good, as it reflects perfectly non-rivalry of consumption. Once a curriculum is established and lecture recorded, there is virtually zero cost to make it available to anyone around the world.

The final part of education relates to network education systems. Here the network itself demonstrates positive externalities, as consuming a resource (i.e., adding users) actually increases the total value of the good. This phenomenon is the result of increasing marginal returns and networked effects. More "educators" (suppliers; including individual teachers, tutors, mentors, etc.) create more value for users (consumers; including students, parents, inexperienced teachers, etc.), and vice versa. Then as there are more various and diverse education applications (complementary products), indirect network effects are observed along with the direct effects.

3. THE AGENCY PROBLEM

The 'professional class' associated with the public school system reflects a phenomenon termed the *agency problem* (Eisenhardt, 1989; Zinyama, 2014). This problem arises when two parties (principals and agents) have divergent interests, and the agent (providers) has greater information, and where it is difficult for the principal (consumers) to directly observe the actions of the agent. In this case, the agent may not always act in the principal's best interest. In this context, the principal is the citizen and taxpayer. The agent is the politician (and educator class). Currently this problem is addressed through various layers of bureaucracy. In fact, the agent teachers represents the agent school administrators, who represent the agent politicians, who represent the principal taxpayers / citizens. Perhaps a main focus for addressing the agency problem should be: Should the principal focus more and more on policing the agents, or try to align the disparate interests and become co-creators of value? Clearly, doing a better job of addressing this agency problem would help improve the public school system.

A key way to achieve this may be to define the size and nature of the responsibility center (RC) (the individual school district). The RC could be a value center (a measure of net value created) rather than a cost center. This means the individual school district would receive some kind of performance bonus, and would manage that measure of local revenue as well as its own local costs. Further, the size of the unit responsible for this net value created is critical to the issue of the agency problem. A smaller unit would reduce the separation of employee, manager and owner; as teachers could manage the schools, and even be part 'owners' (by investing their own money in them). In this case the agency problem would be alleviated by aligning these disparate interests. Teachers take on a greater role in the decision making of the schools, and can then coordinate the community (parents) as co-creators of educational value. Such a unit (small and local, and measuring net value created, not just costs) is herein termed RC.

4. METHODOLOGY

The methodological approach in this study employed methods similar to those of Paul (2014) and Zinyama (2014). This study was based on a review of the relevant theoretical literature, and then undertook a documentary search and examined the data collected. Content analysis was utilized in order to give the collected data scholarly interpretation. As such, the study employed mixed methodology (albeit entirely secondary data), including both qualitative and quantitative elements in its design (see Johnson *et al.* (2007)).

This was followed by identifying examples of organizations reflecting the collaboration economy themes presented above. Internet websites were consulted to secure secondary sources of data. That is, some possible solutions to the public school problems, particularly in the context of the above-mentioned public goods theories, may be found in what is termed the *collaborative* (or *sharing*) *economy*. Refer to Chase (2015) for a full discussion of the collaborative economy.

Interestingly the sharing economy is noted for driving two contradictory trends simultaneously: Centralization and decentralization. Centralization fosters coordination, standardization, efficiency, benchmarking, etc. A key benefit of this is to better leverage assets with excess capacity. Buchanan (1965) discussion of club goods revealed a premise for the sharing economy before it existed.] Decentralization indicates grassroots efforts and autonomy; with the objectives of flexibility, customization, localization, and specialization (Chase, 2015). Local stakeholders

have 'skin in the game'. Moreover, the peer to peer nature of the sharing economy actually begins to blur the distinction between producer and consumer, as they become co-creators of value (as with crowd sourcing). Table 1 summarizes the overriding themes of the collaboration economy and educational products.

Table-1. Contradictory educational and collaboration trends

Centralization	Decentralization
Standardized core	local adaptation
Standardized recorded lectures	smaller class size
Educational software apps	smaller community
Centrally-planned funding	crowd-funding

Therefore, the purpose of this analysis was to assess to what extent certain organizations reflect the above concepts (collaboration economy demonstrating increasing returns) by addressing five specific criteria. Organizations examined include Quality Matters (QM), Khan Academy, Scootpad, and Kickstarter. This study addressed whether the organizations utilized a technology platform as a key part of their product; whether they have attempted and succeeded at installing a large customer base; whether they offer a variety of complementary products; whether they work with many, various partners; and whether they allow and encourage local customization. These five criteria were selected because they reflect the concepts of the collaboration economy and increasing returns industries (Shane, 2009; Chase, 2015).

A good example of an organization promoting a standardized teaching core (similar to the Common Core State Standards) is Quality Matters (QM). The QM mission is "to promote and improve the quality of online education and student learning", focusing on course design. They target higher education and K-12. They develop research-supported, best practice quality standards and appropriate evaluation tools, foster institutional acceptance and integration of QM standards and processes into organizational improvement efforts focused on improving the quality of online education, and offer faculty development training in the use of QM to improve the quality of online/blended courses. QM has 900+ subscribing institutions and over 4000 QM-certified courses (www.qualitymatters.org). Overall QM offers weak-moderate support for the five criteria of the collaboration economy (increasing returns industry). It has a smaller customer base and complementary products than the other examples, and their technology platform is only part of their business model. They do have some partnerships, and they do combine a standardized core with customization and flexibility, as individual DL teachers tailor their own approaches to their unique student needs.

An example of standardized learning platforms or recorded lectures is Khan Academy. Khan Academy, founded by Salman Khan in 2006, is a nonprofit with a mission to provide a free, quality education for all, anywhere in the world. "Khan Academy offers practice exercises, instructional videos, and a personalized learning dashboard that empower learners to study at their own pace in and outside of the classroom. We tackle math, science, computer programming, history, art history, economics, and more." (www.khanacademy.org). Services include exercises with feedback and progress reports. Khan Academy videos have been viewed over 200 million times, and is used by over 6 million unique students per month. The material is part of the curriculum in over 20,000 classrooms around the world. The videos have been translated into 24 different languages (Noer, 2012). While Khan Academy reflects strongly the technology platform, large customer base, and partnerships, it moderately reflects complementary products (exercises, feedback, and coaching) and local customization (somewhat disproportionate focus is still upstream standardized lectures). Khan Academy shows moderate to strong support.

An example of an educational software application is Scootpad. They offer an adaptive learning platform for grades K-8. Scootpad has similarities to Khan Academy but may be stronger pedagogically and is somewhat more focused downstream at the traditional classroom. They create a virtual community / classroom, where parents, students and teachers can all interact. Students can customize their learning paths and advance at their own pace,

where a specific core curriculum has been approved for the student. The app also includes tracking assignments, interactive videos to help students, behavior assessments, eBooks online, helping parents and teachers to connect, tutoring, etc. This product is used by over 6400 schools, 200K teachers, 300K parents, and 2 million students (www.scootpad.com). Competitors include Remind and Class Dojo. Overall, Scootpad strongly illustrates all five collaborative economy criteria (technology, customers, products, partners, and customization).

Finally, an example of crowd funding is Kickstarter. Kickstarter is not specifically related to education standards or technology, but reflects the collaboration economy very well. Kickstarter assists artists, musicians, filmmakers, designers, and other creators to find the resources they require. They have 15 project categories, 12 million people have backed Kickstarter projects, $2.7 billion has been pledged, and 115K projects have been successfully funded (www.kickstarter.com). The organization reflects local customization, as project descriptions and support are very open ended. [A similar lending venture illustrating the sharing economy (but before it was popular) is Grameen Bank, founded in 1976 in Bangladesh, which earns revenue by targeting underserved markets (the poor) with microcredit loans.] Overall Kickstarter demonstrates a technology platform, a large customer base, a large number of partners, and local customization, but a rather limited product variety. Kickstarter shows moderate to strong support for the five criteria. See Table 2.

Table-2. Results of Case Study Analysis

Case Example	Support for Criteria
Quality Matters	Weak-Moderate Support
Khan Academy	Moderate-Strong Support
Scootpad	Strong Support
Kickstarter	Moderate-Strong Support

5. RECOMMENDATIONS

5.1. Funding

5.1.1. Private Investment Accounts as Claims on Public Schools

Based on the theoretical development and current research, some recommendations have been developed. One proposal is to create a national retirement system that manages both the current social security (US) retirement pension with a new system of private investment accounts. This new system would make investments in educational infrastructure, directly through schools. As such, public schools could be funded nationally through the wage tax withholding (FICA). In particular, this system solves the funding gap for some schools, by turning schools into RCs, and creating a buying opportunity to invest in these disadvantaged school districts. Investing in underserved segments can bring the greatest returns if they are established as investments in the first place; as a given dollar amount would represent three times the equity stake in a school with per student funding of just 5K vs. 15K.

But the total FICA withholding rate (15%) likely need not be increased. Currently, monies for social security are not withheld from wages at income levels above 125K. That withholding ceiling should be eliminated, but the additional money, rather than going directly to the social security pension system, would go to public school funding, but through individual private investment accounts that invest in schools. All income levels would pay into both the federal pension and the private accounts, but with lower income levels paying a greater proportion to the private accounts.

This funding system would be similar to crowd-funding, but with three vehicles. One vehicle is a general index fund investing in all public schools according to their current funding levels, another constitutes actively managed funds (managers from the federal Department of Education) that seek to invest funds in schools based upon improving performance, and a pure crowd-funding system where taxpayers select their own school-investments (with certain regulations, such as limitations for investing locally). Individual investor-taxpayers would decide the

balance between these three vehicles. They could also change and rebalance portfolios, again with certain limitations. Likely the first year or two all funding would go through only the general index fund to give schools time to adjust to the new funding regime, and to give time to fund managers to find those schools that are poised to improve their performance.

5.1.2. Return on Educational Investments

The 'return' from these schools would go into individual private investment accounts for retirement. So what would drive the return of these investments? It relates directly to the key metric of this entire system: The performance measurement of public schools. The way to measure performance is to address the very purpose of public schools. The purpose of schools (namely high schools) is to graduate productive members of society. In this spirit, schools (and therefore investors) are rewarded according to graduation rates, and for the productivity of the graduates (college attendance rates, quality of colleges attended, full time work, military service; speed of these placements, etc.) Further, politicians would not measure teacher performance, the schools themselves would address that.

As such, this national school 'pay for performance' regime would be driven by a national placement network, with bonuses paid to schools as their graduates are selected. The actual placement fee would be large enough to motivate seeking out those schools with the greatest potential, but small enough so as to not create a disincentive for actual placement. (The return being smaller than the original withholding reflects the positive externalities of education.) The bidding process would yield the greatest return for schools delivering top notch graduates; yet any low bids still allow 'at risk' students to be productively placed (especially if tax credits up to a maximum amount are offered for employer selections, though with certain regulations – such as minimum employment terms.) Some form of state and/or federal matching funds may also be needed as a bonus awarded to the school, and other bonuses, in order to reduce the cost for employers to select graduating students. This national placement network would demonstrate the increasing returns phenomenon.

5.2. Organizing

5.2.1. Agency Theory and Teacher-Run Schools

However, these RCs may be assessed at the level of individual schools (graduation rates tracked per individual high school; with earlier grades tied directly to particular high schools), perhaps not the entire school district. A large city may have hundreds of high schools. But with a more localized RC, some of these schools may conceivably be teacher-run (meaning fewer administrators, who would actually work for the teachers). With so many small, local units (which diminishes free riding) competing with each other, and measured for actual performance; the flexibility, customization, localization, and specialization offered by employee-managed RCs may foster greater productivity.

5.2.2. Citizen Participation

Once the RC receives the withholding funding, how would they deploy these resources? They could pay local community citizens to be co-creators of value (refer to Callaway and Dobrzykowski (2009)) for a discussion of how co-creating actors leverage external resources to develop a resource and knowledge-dense environment to create value). Indeed, the purpose of education software companies Scootpad, Remind and Class Dojo currently is to connect teachers, parents and students to make them partners in the local educational process. (The federal Department of Education should establish one single online classroom community network for all schools to tap.) In short, the bonuses paid for the national placement network award school RCs for performance outcomes, while the school RCs pay local citizen participants for effort (contributions to their own local education), such as parental support, chaperones for local events, tutoring, mentoring, counseling, etc., in addition to teacher salaries. In this

sense the entire local community constitutes the RC, while the school principal and tenured teachers are the managers of the RC.

5.2.3. The Standard Core

The Department of Education should offer several competing Common Core standards that local school district RCs could choose, where student achievement between these standards would be tracked over time. Each of these cores would not only constitute standard curricula and teaching pedagogy, but texts and recorded lectures, including online exercises as well. As an example, the Khan Academy creates recorded lectures, then partners with local educators who use these standardized lectures along with their own traditional classroom activities, a process called 'flipping the classroom'. In the future, each of these recorded lectures could tie directly to a full common core standard teaching philosophy and pedagogy.

A further example of a national educational network (and demonstrating increasing returns) would include Scootpad, which is an adaptive learning platform for grades K through 8. This system offers personalized learning, and as such, can offer a kind of 'mass customization' of learning approaches. A system such as this, in combination with Khan Academy and others, would include software organizing a national peer to peer (student to student) tutoring database. Such a network would be the ultimate demonstration of the sharing economy, blending the role of the producer and the consumer, and generating extensive increasing returns.

6. CONCLUSIONS

In conclusion, this paper has taken the lessons of the collaborative, or sharing economy, and described how they can be applied to a new way of organizing, funding and improving the public school system in the United States. The proposal detailed above describes some elements of centralization (establishing a national placement network, standardizing educational learning platforms similar to Scootpad and Khan Academy along with Common Core standards, creating a national peer to peer tutoring network, standardizing a national community network similar to Class Dojo or Remind) as well as elements of decentralization (establishing very local RCs with small class size and community involvement as well as crowd funding of public schools). In doing so, this paper has made very clear classifications about what specific aspects of education can be considered public goods and in what way.

Taking the RC approach to a new level, perhaps the RCs would not only separate individual high schools from each other, but could separate primary education (grades K-6) from secondary (grades 7-12). In this sense students could "graduate" from primary school to secondary school, through a national placement network, where secondary schools bid for students from primary schools. So while crowd funding of schools turns underfunded schools into investing opportunities, this offers the opportunity for secondary schools themselves to also invest in underserved segments – disadvantaged students. Neighborhood associations could form around the local elementary school (blurring the distinction between the primary public school and home schooling; i.e., producer and consumer) as their own fund-seeking RCs. These primary schools and indeed the entire community RC would be rewarded for graduating the most motivated students with supportive parents. The only national standard achievement tests in this case would be at the 6^{th} grade and 12^{th} grade levels.

Moreover, such a crowd funding of local RCs could include many elements of infrastructure, and not just education. Transportation is a likely choice; anything where performance returns may be measured and fares collected. The Department of Transportation could standardize technology and establish various platforms, to coordinate national transportation systems of people and freight, while citizens make investments into various transportation projects (RCs).

Finally, the current paper has described an approach to public education in the United States. Discussion about how these principles may or may not apply globally, is of the utmost importance. The sharing economy is a global phenomenon, while government standards may be very different between countries. It is my hope that this paper

will spark debate and further research into how to foster innovation in public education as well as other public sectors, all over the world.

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