

**Education Tools in an Incomplete Market:
The Challenges of Using Technology to Drive Customization**

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Much has been said about the potential of innovation to reform education and, given the Zeitgeist, it seems to be rather a moot point. Educational entrepreneurship combines the sexiness of dot-com with good old American “can do” spirit. But the focus has rested squarely on innovators changing the production of schooling. This project rightly notes that for change to occur, one needs a market with both suppliers and consumers willing and able to interact. This interaction is what elicits an eventual economic equilibrium where suppliers and consumers interact in a way where both have maximized their benefit. However, without distinguishing between the sides of the equation in the nation’s analyses of what does and doesn’t work in educational reform, all we are left with the old story of the tree falling in the woods: without anyone around to ‘consume’ the sound of the fall, the tree’s crash is essentially meaningless. Without an evaluation of the demand-side of the market equation, resting our analyses entirely on supply is also incomplete.

We are evaluating what ought to be a fairly benign subsector – that of educational tools which support schooling – and using economic theory to reason through the potential value of using these tools to reform schooling. One can already infer from the title of this chapter that we are telegraphing what we perceive as thwarted innovation; we have an utter lack of hope on the potential of the tools to significantly impact schooling unless policymakers taken certain steps to fix the demand side of the equation.

What Is an “Educational Tool?”

In this chapter, we will examine the use of educational tools not only in terms of how they might impact learning, but also as a litmus for educational entrepreneurship more broadly. To explore the use of educational tools, we use the lens of economic theory, and we also use

some evidence to support our analysis and conclusions. However, some structure and caveats are needed. In terms of a structure, we will first define an educational tool and what a demand for educational tools might be, and then we will use two examples of educational tools to illustrate our analysis and highlight potential problems in the current direction of the reform movement.

To start, we can define an educational tool and its uses. Further, we reason through what economic demand for it might be. In its most fundamental sense, one can think of a ‘tool’ as something that aids in the process of producing a good or service. For example, in the car industry, the assembly line may be considered a tool. Also, a tool is perhaps also something that facilitates the bringing to market of the product or service. In other words, a tool may not necessarily be important in the construction of a good or service, but instead is crucial in the post-production process. For instance, a company’s website may be tool, as it links production to purchase.

In terms of economics, the production function models a firm’s input-output process. The function asserts that materials enter the firm (i.e., the inputs) and the result is a product based on having these inputs (i.e., the output). In the model, a tool is what aids in the transformation of these inputs into outputs. In essence, the tool is the technology, eliciting interactions and synergies among the various inputs. Because we are examining K-12 schooling, one can also define tools in terms of the educational realm. For this purpose, a tool is specifically any process or instrument that facilitates the development or delivery of education (i.e., the output) based on a series of inputs (i.e., students, teachers, classrooms, schools, etc).

We think this is an appropriate general definition for an educational tool. It will allow us to identify those aspects that change (and hopefully enhance) the educational experience in some capacity. This general definition is also reflected in the education production function,

implemented by economists and sociologists alike. This education production function is based on the standard, aforementioned economic production function. In this case, the tool is a change in the learning process, turning educational inputs (i.e., students, teachers, rooms) into academic outputs (i.e., achievement, graduation).

However, within the universe of educational tools as we have defined them, there are some processes and instruments that for various reasons will complicate any potential analysis. We believe that if we were to use such examples it would lead us overall to the same conclusions but it would obfuscate the more obvious lessons, so we are going to advocate that we further narrow the field of educational tools.

One example that is fundamentally problematic is online learning. While companies may provide these online educational services to enhance learning, there are several online service providers that both supply individual schools and/or districts with supplemental materials or individual classes (e.g., an interesting company like Educere, which “sells” empty seats in college online courses to high schools to meet dual enrollment requirements). However, there are also organizations that could be viewed as not only supplying tools or even individual courses to schools and districts but that also actually compete with schools and districts in the delivery of schooling. The e-learning company K12 comes to mind as an example of this type of organization.

K12 is a corporation that has contracts with, and often manages, many public schools throughout the country, reaching a total of 55,000 students. K12 is an entirely online group of schools, with an online, student-focused, individuated curriculum. Unlike a typical school in a district, students in K12 interact with teachers online, and submit homework online as well. Students can also learn offline; however all offline material is also provided by K12 rather than a

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district school. For example, K12 sends pedagogical materials to students' homes, and students engage in activities and homework assignments with the help and guidance of their parents. Thus, in competing with a school district, K12 attempts to use a technological medium to provide student-directed learning. K12 does so by drawing upon the expertise of content area experts in science and math. They offer an integrated content training approach, in which scientists train the developers who create K12's curriculum. In this fashion, not only is K12 directly competing with a school district on learning styles (online versus offline) but also on curriculum development.

We argue that our analysis also captures challenges these organizations face when it comes to consumer demand. However, in the specific case of online learning, the analysis becomes too muddled for this chapter. This is so because the service these companies provide can be two-pronged. It can be complementary to the school's educational environment, and in this case, it would be considered a tool. However, in the case of K12, the same educational 'tool' could also appear to be a substitute to the district's education. In this regard, the same tool now is framed as being a competitor in the market, rather than as an educational enhancer to the district. The fact that the tools of online learning can be seen from these two perspectives implies that the analysis becomes complicated. As such, we recognize that these online companies do exist, though we choose not to focus our energies on tools that can be viewed as both complements and substitutes for schooling in the eyes of a district administrator.

The second constraint we want to put on our parameter is one of scale. We recently held a summit of educational entrepreneurs. In one of the presentations, Larry Berger from Wireless Generation observed that the educational tool sector does not follow the typical Pareto curve, which is convex and implies that in any given industry, there ought to exist a smaller number of

very large and very small producers and a much larger number of mid-size firms. Visually, this would appear like a bell-curve, with a normal distribution.

Instead, Berger noted a different shape in the education market. When it comes to providers of educational tools, various subsectors can have an almost infinite number of very small providers (think of retired principals as consultants), a few very large providers, but also only a few mid-size firms. This stands in sharp contrast to the Pareto curve from above. We decided to label this concave function the “Berger Education Pareto Curve.”

We will return to Berger’s hypothesis later in this chapter but for now, suffice it to say that we suggest it is not useful to look at examples of industries that are described by the Berger Education Pareto Curve. For instance, the textbook industry (which provides a very concrete notion of education tool due to the tangibility of a book as well as the ease of construction its market valuation) has attributes that would be characterized as firms possessing market power. Following the same logic as with the online learning companies, we will not focus our analysis on the textbook industry or on the scores of small educational tool providers that only serve one district.

This leaves us with several poignant alternatives to use as examples on which to focus our analysis. We have elected to focus upon Wireless Generation and SchoolNet because they are generally perceived as both good businesses and educationally minded social endeavors, and they each provide what seem to be regarded as high quality, effective “educational tools” that support schooling.

Wireless Generation is known for its mobile assessment software. In 2000, two Rhodes Scholars founded the organization. They were interested pinpointing where technology could make a meaningful improvement in the interactions between student and teacher. They first

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invented the mCLASS system, a platform that enables teachers in grades K-6 to efficiently give assessments using a handheld computer instead of paper, receive real-time data on students' needs, and access both mobile and Web-based tools for using data to improve teaching and learning. With this mobile assessment software, among others, the company has built its mission on improving teachers' classroom assessments and allowing them to make data-based instructional decisions. As such, Wireless Generation has allowed for the growth in the educational environment by providing technology that analyzes student data and provides curriculum customized to individual learning needs. Wireless Generation currently serves more than 200,000 educators and 3 million students.

SchoolNet is known in the market as a provider of data-driven education software that helps align student assessment, curriculum and instruction, and operational efficiency. SchoolNet was founded in 1998 by experts interested in how technology could improve educational reform. The founders initially developed tools to streamline education technology and generate online programs that were easily understood by educators. According to company rhetoric, the purpose of every product is to improve teachers' capacities for student assessment, the development of curriculum, and the improvement of instruction. Thus, these tools aim to guide collaborative, data-informed discussion and to enable targeted instruction for all students in the classroom. The solutions are used by many of the nation's largest school districts, including Chicago Public Schools and the School District of Philadelphia.

In the scope of this discussion, these two companies provide benign and uncontroversial educational tools to evaluate. They are first and foremost considered tools because they enhance the inputs to education. Further, they are benign because the suppliers of these tools are not in direct competition with the district (i.e., they are not substitutes), nor are they monopolists. To

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be clear, we are simply using these organizations as examples of applying economic theory. We did not evaluate the performance of these companies vis-à-vis educational reform in any analytical way.

What Is Demand for an “Educational Tool?”

Now that we have clarified what can be categorized as an educational tool and have focused our analysis on which educational tools we consider “benign”, it makes sense to develop an operating definition of the demand for such tools. In its most basic form, what we call “demand” for an educational tool (or any product for that matter) is actually the aggregation of each individual consumer’s desire for the tool given the constraints of the price of the tool and the budget of the consumer. The process of aggregating each individual demand curve leads to what is known as market demand. Consumers will make choices based on these preferences within the constraints that exist. Within this context, the value of educational tools becomes then fairly easy to assess; namely, it is their ability to add value in the educational process versus how much they cost.

One question for our analysis is, “who is the consumer?” If the suppliers are Wireless Generation and SchoolNet (i.e., those agents delivering the educational tools), it is crucial to know to whom they are providing. Only with the identification of supply and demand do we have a market. We think it will be beneficial to look at two different consumers; first, from the point of view of the district as the entity that is responsible for the schooling, and second, the parents, who make the “choice” of where to live and/or where to send their child to school.

We suggest looking at consumers in this dualistic way because of the nature of how tools are marketed in a final product. An example of our thinking might be to see how both a car

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company (analogous to the school district) and a car purchaser (analogous to a parent) think about the car stereo in the car. The producer of the overall product, such as a car manufacturer, certainly has preferences based considerations like cost and compatibility. However, the manufacturer also recognizes that additional car attributes, like the brand of car stereo, also matter to the end-consumer. Thus, the inclusion of a Bose car stereo boosts the marketability of the car, and increasing “intermediate” demand by the car manufacturer for the stereo. Again one can think of microprocessors, such as Intel, in computers as being the tool demanded by the final consumer (i.e., the individual) but intermediately demanded by the laptop manufacturer. Based on the evaluation of benefits and costs, an intermediate consumer, like Dell or IBM, may find Intel to add value to the final product. They may particular find this attribute invaluable to the marketability of the computer because the end-consumer desires it so.

The point is that it is not uncommon to see producers of the larger product leveraging the brand of the attribute to help differentiate the larger product in the market. In the framework of education, we will reason through how both parents and districts, as consumers, could demonstrate preferences for these two educational tools – Wireless Generation and SchoolNet.

What is an appropriate conceptual model?

In economics, there’s often a popular quip in regards to demand. The joke is quite short, with two economists looking at a Ferrari:

Economist 1: “I want one of those.”

Economist 2: “Obviously not.”

To understand this punch line, it is necessary to know a little bit about revealed preference. This concept, first described by Samuelsson in 1938, states that what you want is

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revealed by what you do (and not by what you say). As the adage goes, actions speak louder than words. If the first economist had really demanded a Ferrari, he would have already bought one if he did not own one already.

In more detail, economists have three main approaches to modeling demand. The first is the cardinal approach. In this framework, an economist would ask consumers how much ‘utility’ they would receive from consuming a particular good. The economist would then aggregate all goods and services and subsequently calculate demand based on the assumption that people consume the combination of goods and services and maximizes total utility.

A second approach, the ordinal approach, does not require consumers to determine how much utility they would receive from a particular good. Instead, an economist evaluates how much relative utility consumers receive from consuming one item compared with another. That is to say, an economist would be interested if consumers prefer one basket of goods to another or are indifferent between them.

There is a setback when using these two first approaches to understanding consumer demand. Notably, both cardinal and ordinal demand estimations are based on the notion of ‘utility.’ While utility may have its utility (for lack of a better word) in economic theory, its policy implications are questionable. This is so because measures of utility are empirically unobservable. In case of cardinal utility, for instance, it is impossible to construct a quantifiable measure of the satisfaction a consumer receives from a particular good or service. That is, though it is possible to assert theoretically that consumers maximize utility when choosing a particular bundle of goods and services, there is no empirical proof. As for ordinal utility, an economist would have difficulty observing the infinite choice-sets and pathways that led a

consumer to choose a particular good and service. Thus, finding the relative value of a consumer's choice seems dubious.

While the first two approaches are based on this nebulous concept of utility, it is not utility itself that is so controversial in the public policy arena. Rather, it is the idea that utility forms the basis of demand (and hence the demand curve in economics); for, it is in demand in which we describe consumer behavior. However, if the basis of demand is this notion of utility and if the concept of utility itself remains so vague, then it seems nearly impossible to truly describe why consumers act as they do under these theories. That is, in reality, no one has ever seen a demand curve.

A third approach attempts to evade the theoretical issues of cardinal and ordinal utility. This method of understanding consumer demand is known as revealed preference. To model demand in this scenario, it is only necessary to be able to compare an individual's consumption decisions in situations with different prices and/or incomes and to assume that consumers are consistent in their decisions over time (that is, if they prefer good A to B in one period they will still prefer A in the next). In other words, the goods and services that a consumer has selected in the market represent the best possible option for that consumer. Empirically, revealed preferences imply that preferences of consumers are revealed by their purchasing habits.

As a brief example, assume a consumer selects a first bundle of goods whereas a second bundle of goods is more affordable. Empirically, the first bundle of goods is revealed to be preferred to the second. Further, it is then assumed that the first bundle of goods will always be preferred to the second. Because of the consumer's actions in the market (which can be demonstrated by the fact that he or she physically selected the first bundle over the second),

preferences have been revealed. In this way, all selections that consumers make are then part of the revealed preferences framework.

This revealed preference system of demand has the potential to provide critical information about the ways in which consumers select goods and services in reality, without the reliance on vague measures of utility. In policy, it may be possible for empiricists to develop a rubric by which demand can be described and tested based on the choices that consumers tend to make, rather than having to rely on hypothetical decisions. Therefore, if patterns of revealed preferences are made evident, then suppliers may be able to tap into a particular market to satisfy demand more effectively. This can be true of any market, including education.

Applying the theory

We hope we have now persuaded you that looking at market innovations without considering the impact of demand is a pointless exercise and that revealed preference may be the most prudent way within economic theory of evaluating the demand for innovation within education. If we apply the scenario to SchoolNet and to Wireless Generation, we would expect the tools to be ubiquitous among districts and to see the tools branded as value added attributes to parents and policy makers. We suspect that you see where we are headed; neither company has been able to penetrate the market to the extent that one would expect. To be clear, they are both very successful companies in the fact that they serve millions of students and upwards of a thousand districts, but that is less than ten percent of the market; and yet if they are suppliers in the largest districts in the nation, then they are (or at least have the potential to be) “best of brand” so to speak.

The reason for the lack of total market penetration exists due to a poorly functioning market. While there is the apparent availability of educational tools by these two companies, their supply is nevertheless not satisfying demand if only ten percent of the market has been penetrated. Something has gone awry in the educational market; we will argue that consumers have not been able to reveal their preferences. Thus, the supply-side has no gauge or empirical evidence of full demand (from both parents and districts) for their product, and thus no outlet.

If, for the moment, we assume that the supply-side has created the adequate technology to meet demand theoretically and is yet not meeting demand in reality, then it seems clear that a further evaluation of the consumer-side is in order. Our diagnosis, then, is that perhaps the market failure has arisen because the educational market has not sufficiently focused on who or what is doing the demanding. There is simply a market failure.

For demand (in our case, revealed preferences) to function properly, the market must exhibit the five following characteristics: *Widespread Availability of Information, Ease of Market Entry and Exit, Absence of Significant Monopoly Power, Achievement of Public Interest Objectives, and Absence of Market Externalities*. We are going to suggest that none of these characteristics are present and as a consequence, at least for organizations like Wireless Generation and SchoolNet and in all probability for all educational tool providers.

To help inform policy-makers, let us spend a little time reasoning through whether *prima facie* the characteristics requisite for a market are present in the educational setting. We will again telegraph our finding; using a very blunt anecdotal approach quickly leads us to the conclusion that indeed the market is incomplete.

Let us start with the market assumption of the widespread availability of information. In theory, all parties in the market, both firms and consumers, must be well informed in order to

make effective decisions. Timely and relevant information must be easily accessible to both parties in order to achieve what economists refer to as ‘pareto efficiency.’ However, barriers to information weaken the ability of parties in these markets to function efficiently. We decided to explore this a bit with our two example companies – SchoolNet and Wireless Generation.

A quick scan of some of the professional literature reinforces our perception that each of these companies is well regarded by education professionals. In addition, if one visits each company’ website, there are a significant number of laudatory testimonials by important districts. There are, in fact, testimonials from school districts in 15 states. These testimonials are made by teachers, directors of instruction, principals, and reading specials. This was the first set of consumers. None, interestingly, were from parents or students. There is an absence of movement from our second set of consumers.

Our first assumption, then, is that much like a computer company who advertises “Intel Inside,” it seems to be the provider (the district) of the final product who markets the tool to the final consumer (the parent). Thus, we decided to look for evidence of how districts themselves frame their provision of education around these two organizations (we wanted to investigate in more depth if the district advertises its own version of “Intel Inside”) in their own ‘markets’ (i.e., to parents and students).

We began by selecting the ten largest districts that both companies mention serving. A perusal of these ten districts’ web sites makes no reference at all of any partnership and/or vendor relationship with either of these two companies. In addition, for at least one of the companies, there is evidence to the contrary: it appears that several districts have obfuscated their relationships with SchoolNet. From what we can tell, some of the districts that have

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selected SchoolNet have rebranded the educational tool. Examples include Philadelphia, (IMS, FamilyNet), Denver (The Teacher Portal) Atlanta (INSIGHT) and Albuquerque (AIMS).

We further wanted to explore this obfuscation. A brief survey that we conducted using social networking tools to elicit participants yielded a group of 452 respondents. Among the list of questions included the following three questions: “Do you know the brand of car stereo in your car?”, “If you own a PC, do you know if you have an Intel processor as a component?”, and “Have you ever heard of either of these two software companies: Wireless Generation or SchoolNet?”

Of the overall sample, ninety-six percent of respondents knew if they had an Intel processor in their computer and seventy-four percent knew the make of their car stereo; only sixteen percent had heard of either Wireless Generation or SchoolNet. Given additional questions in the survey, we can identify two subgroups among our respondents (noting that there are potential biases in the responses because of the non-random selection process by which we solicited responses) that correspond reasonably well to our two types of consumers – parents and educators.

If we look at the professional education group as those who work within the ten largest districts served by both SchoolNet and Wireless Generation, we have a sample of 77 respondents (we listed the districts in our survey). Among this group, fifty-three percent had heard of either Wireless Generation or SchoolNet and while only forty-seven percent knew the make of their car stereo. However, fully one hundred percent knew if they had an Intel processor in their computer. In other words, of those who work in districts that Wireless Generation and SchoolNet supply and thus who ought to be encountering the tools on a frequent basis, only a little more than half had heard of either educational tool.

Among the broader group of respondents who self-identified as educators (sixty-six percent or 298) but who lived all over the country, only twenty-three percent had heard of either Wireless Generation or SchoolNet yet this same group, ninety-eight percent knew if they had an Intel processor and sixty-three percent knew the make of their car stereo. So among professionals who ought to have some sense of either a competitor's attribute or a potential tool to help them provide a service less than a quarter had heard of the tools.

If we focus the survey on the non-educators and examine the general public, the news gets bleaker. Among the non-educators, sixty-three percent of the respondents were parents (97) and of that 64 lived in one of the districts we identified as being served by both SchoolNet and Wireless Generation. Among this latter group, only four percent had heard of either Wireless Generation or SchoolNet. So among parents at districts using the tool only four percent were aware of the tool. That is, direct consumers of education had no notion of the attributes that compose their final product. In our minds, this is analogous to having a PC and not knowing whether or not your processor was made by Intel.

However, this is not the case for the computer market. If one expands to the broadest group of non-educators in our sample (154), only two percent have heard of Wireless Generation or SchoolNet, yet ninety-two percent knew if they had an Intel processor and ninety-five percent knew the make of their car stereo. Given the important made around school choice as a strategy for educational reform, these anecdotal results do not bode well for reformers.

It is striking to us how unknown these two educational tools are given that they are generally believed among experts to be incredibly useful to the educational endeavor. Moreover, these educational tools do not seem to have any negative image associated with them, but instead – as the website testimonials demonstrate – actually enhance the educational product. In other

words, there is nothing to hide. Thus, given the supposed synergistic relationship that exists between districts and Wireless Generation or SchoolNet, one would expect districts to brand themselves – both within the professional world and the world of parents as users of these tools – in the same way we see high end automobiles marketing their stereo systems as product attributes. Yet at least from our brief survey, the exact opposite seems to be occurring.

The consequence, we believe, is that there is a significant market failure in terms of access to information on these education tools both to professional educators and to parents. The lack of available information leads to an asymmetrically designed market, in which one group (namely the district) has more information than the other (parents and students). To reel this discussion back into revealed preferences, it is not possible for parents or students to reveal their educational preferences because there is simply no outlet through which their preferences can be revealed. They do not know if they prefer good A over B because good B (Wireless Generation or SchoolNet) is never presented to them as an option.

The problem, then, is that this incomplete market cannot be replicated in new ventures, which explains why these companies have only penetrated less than ten percent of total districts, even though their product is seemingly so successful. With the lack of information on the entire landscape of demand, there is simply no demand for the suppliers to evaluate. As a consequence, the supply of effective educational tools remains limited. In the case of Intel, both Intel and Dell know their consumers' revealed preferences – they have analysts who know exactly how much a consumer is willing to pay for a laptop with Intel processing. Thus, in designing new technology and sparking innovation, the market for laptops can adjust to both supply and demand, making transactions readily – and globally – available.

In the case of an educational tool such as Wireless Generation or SchoolNet, such replicability is not possible simply because we do not know the demand schedule for consumers of the products. Educators seem to “like” the product according to the testimonials on the companies’ websites, but there is no information on how the final customer enjoys the product. Thus, there is no way to access current demand in education or hypothesize about future demand in other, currently non-served markets. Without transparency of information, it would appear that widespread innovation is not possible.

There are other challenges to the efficiency of the market when it comes to demand for these education tools. We will next quickly discuss two other requirements; the ability to enter into and exit a market and whether there are tendencies towards monopolies.

We have already mentioned the idea of the “Berger Pareto” curve. In a well-functioning competitive market, no firm has power to dominate the market. From a supply-side perspective, the existence of significant monopoly power in a market restricts the participation opportunities of smaller competitors and potential new market entrants. The market pressure for competitive efficiency and innovation is reduced. This change in the market is extremely detrimental because consumer choice is weakened.

Within K-12 education, this challenge to market efficiency is most evident in the textbook market. The structure of the market lends itself to tendencies towards monopolies; there are really only a very small number of textbook publishers in the United States. Some of this may be due to efficiencies in production (e.g., it may not be feasible to make a different history text book for each of the country’s approximate 14,000 districts), and this can be thought of as a tendency toward a natural monopoly and may be regulated as so.

That being said, we posit that part of the tendency towards monopolies can be a tri facta combination of monopsony, a highly regulated market, a long sales cycle interacting with turnover in school leadership. Specifically that it is again the skewedness of the demand side of the equation that forces the market into few large producers who look to contain costs and relatively little disruptive innovation through new entrants.

A monopsony exists when there is in effect only one buyer of a good or service. The educational system in this country has in effect not one market but thousands of smaller markets, each which can be characterized as a monopsony; each district, by law, is in essence the sole consumer of educational tools. The consequence of having our school systems in monopsonies is that they tend drive down the price of a service, for the producer of the product only has one option for a consumer and is subject to their demand – analogously to the way in which consumers are subject to the prices placed on the market by monopolies. As a consequence of these educational monopsonies, innovators are less likely to enter into a market – there is no incentive if firms cannot be profit-maximizing. Thus, the empirical evidence of the school district “markets” is what we would expect – little innovation and few providers of educational tools.

Having free entry and exit allows for markets to function efficiently. However, when barriers to entry exist (e.g., monopsonies, restrictive licenses, very large investment requirements, etc.), there is a reduction in firm potential for participation in the market by suppliers. This has the negative effect of limiting the extent of supplier competition (and thereby market efficiency). With the lack of competition, consumers may not be able to make their preferred choices, thereby having to select a less efficient bundle of goods and services due to

affordability not prompted by a properly functioning market. In essence, their revealed preferences are somewhat skewed.

A final challenge in this area can be thought of as selling entropy. According to the Council of Great City Schools, the average tenure of a superintendent is 3.5 years. One recent estimate of school districts' cycles is eighteen months for major purchases such as software systems. This suggests that there is a large probability of entropy; having to "resell" to a new superintendent because of turnover. The problem here is two-fold and is in essence a downward spiral. First, because of the monopoly characterization of the education market (in which, in essence, the superintendent has full market power), it becomes extremely difficult for suppliers to evaluate the preferences of their markets because their (often sole) consumers are so frequently changing. This makes innovation difficult; since the current superintendent may reveal different preferences than the new superintendent three years down the line, it makes firm research and development an extremely risky endeavor. As such, firms are less incentivized to innovate or even enter the market, leaving consumers with little choice in their educational tools. And this little choice in tools implies preferences may not be fully revealed to begin with. Thus, the suppliers on the educational market are working under the constraints of skewed demand preferences, thereby further inhibiting the incentive to innovate.

There are two other requirements for efficient markets on the demand side that also seem to be absent for schools – a lack of externalities and achievement of public interest objectives. If all the costs of producing a good or service are not borne by the firms supplying it, the additional social costs (e.g., pollution) are external to the market. If the benefits to society are not all captured in the prices that consumers pay and the revenues the firms collect, the social benefits (e.g., public health and safety) are external to the market. In a well-functioning market, the social

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costs and benefits are fully recognized within the market. There are no spill-over effects of consequence. When the market achieves its goals of efficiency, innovation, and consumer protection, it will at the same time achieve any special public interest objectives as well. There are no special public interest objectives to satisfy (e.g., universal coverage) that go beyond the capabilities of a well-functioning market. There are certainly a host of positive externalities and public interest objectives in education (e.g., increased housing prices, tax bases, reduction in crime, etc.). For educational tools these could be captured in a way similar to how insurance companies reduce premiums for drivers who have cars with safety features in them. One could envision given a district getting a funding premium for using certain technologies that add value to learning.

Policy Implications

We have argued, using Wireless Generation and SchoolNet as examples, that the K-12 education ‘industry’ has a number of characteristics that prevent consumers from revealing their true preferences, whether the consumer is a parent or a district leader. If one accepts this premise, then it stands to reason that for all intensive purposes, there is no market or at best a very poorly performing market. This means that the most well intentioned efforts to foster innovation will fail because there will be little incentive for producers to continue to innovate and even innovations that seem to hold promise and yield results will not be able to become ubiquitous in a system that has no “system” and no ability to disseminate information.

Furthermore, if educational markets are monopsonies as deemed by the market structure of individual districts, then firms inspired to create new educational tools are actually inhibited from generating new growth, as there are barriers to entry and exit, based on the price set by

consumers. If there are no profit-maximizing incentives for firms to enter the market, then monopsonistic consumers begin to face monopolistic suppliers – i.e., what we experience in the textbook industry for instance. As a result, market inefficiencies spurred by demand may allow for further inefficiencies on the supply-side.

One potential implication of this analysis, then, is that there is simply not enough information in the market for reform. While Wireless Generation and SchoolNet and the district are in full communiqué, the same cannot be said about parents – the true consumers of the educational tool. Although we cannot make any causal claims in this analysis, there seems to be a high association between lack of knowledge on the part of parents and the lack of market penetration. The crux of this problem, then, is that if educational innovators have created an effective tool, but it cannot be fully realized in the market since the final consumers cannot reveal their preferences. It is analogous to Intel not truly knowing if Dell’s customers prefer a particular processing chip. Without such insight, it seems unrealistic that Intel (or Dell, for that matter) would invest heavily in research and development. Thus, without a full evaluation of the demand landscape, it becomes difficult to design for future educational opportunities on the horizon.

Our analysis also suggests that the current public policies directed at fostering changes to market power might also be effective – given scarce resources – for facilitating the creation of a true market with all of the characteristics described above. At a minimum, dealing with issues of monopsony and monopoly and the utter lack of efficient mechanisms to disseminate information in these markets would be the most fruitful policies to undertake if one truly wants to foster an entrepreneurial culture. For as the market currently stands, there is a lack of educational innovation from the fact monopsonists dominate and that the tenures of these monopsonists are

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quite short. The fact that preferences are shifting every few years is compounded by the fact that there is little incentive to innovate or even enter the market, thereby inhibiting the true preferences of educational consumers to be revealed, and thereby limiting future growth and reform. Thus, while the etymological origins of entrepreneurship suggest “champion,” few would hold up Don Quixote’s jousting at windmills as the most salient example of a successful endeavor.