

Market to Watch: Adaptive Learning in Developmental Education

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SUMMARY

Developmental education, also known as remedial education, has long been a significant pain point for colleges and universities and a weak link in their ability to foster student success. Students do not like taking what are often non-credit courses to qualify for credit programs, and faculty often do not like teaching in programs with such high historical drop-out and failure rates. Furthermore, with recent attention being brought to higher education's ability to retain students, developmental education has once again come into the spotlight.

In the current focus on developmental education, however, we see considerable potential for adaptive technologies to raise the rate of student success – first for developmental education students and later for *all* students. Providers of these technologies have created a set of individualized learning tools that enable students to acquire help precisely where they need it, even as they reduce dependence on costly faculty time and attention. Events across K-12 and higher education converge to make this an opportune time as they create and grow a “bridge market” in grades 9 to 14 that spans the two education sectors.

This research brief covers the role of adaptive learning technologies in sparking new opportunities for providers and institutions to work together productively in 2013 and beyond.



INTRODUCTION

Developmental education has been a necessary on-ramp to today's higher education system. However, high participation rates in developmental programs, especially in community colleges, are costing colleges and taxpayers increasingly large amounts of money. Estimates place the cost of developmental education in the range of \$2 billion annually¹. Today, combined with declines in funding for public institutions and rising costs across most of higher education, colleges cannot afford these costs.

The need for developmental education arises because of the gap between what students learn in high school and what they are expected to know upon entering college, and the burden of providing developmental education lies with community colleges, in particular. Government agencies such as the U.S. Department of Education have estimated that 43% of students need at least some developmental education; the national non-profit organization Complete College America puts that figure at 75%. Experts agree that these figures continue to increase and that a large percentage of these students are at risk of dropping out of college entirely. In fact, the likelihood of a student who tests into developmental education to even complete the required or recommended courses is about 33% in math and 50% in reading². The combined effect of higher rates of remediation and lower college completion is adding materially to the high and rising national cost of higher education.

Recently, however, the intersection of education and technology has yielded some progressive solutions that suggest dramatic improvements in developmental education success rates. Both students and institutions will benefit from the potential for lower instructional costs and avoided recruiting costs (i.e., to replace the developmental education students who will drop out).

Educational technology, which aims to improve student participation, engagement, and learning through the use of information technology, is a growing industry that facilitates the delivery of educational content and courses to students. Increasingly, educational technology also delivers personalized learning experiences tailored to the unique needs of individuals. The mechanism for this change is embedded assessments associated with content designed and tested to remediate knowledge gaps. The student is not only told "You're weak in this subject, please take the following one or more courses" but also "You're weak *in this aspect* of this subject, please review these materials that address your needs and demonstrate mastery as soon as you're ready." The developmental sector stands to benefit greatly from the promise of these adaptive learning solutions.

Why is this the moment for innovation to take hold in developmental education? Ten years ago, the private sector (e.g., Sylvan Learning Systems, Kaplan) entered the developmental education business through tutoring partnerships with community colleges. These path-breaking companies quickly discovered that the culture and decision-making capacity in academia was a challenging fit with the financial demands of stakeholders. Since then, advancements in technology's applications for learning and a growing student preference for individualized instruction are making possible new instructional models. A growing number of institutions are ready to consider technology solutions that promise improved instructional productivity with outcomes that are at least as good as traditional methods. In the presence of policymakers demanding more from colleges in terms of improved graduation rates, this creates fertile ground for today's market evolution.

¹ Source: The Gates Foundation

² Source: Columbia University's Teachers College

THE CASE FOR ADAPTIVE LEARNING IN DEVELOPMENTAL EDUCATION AS A GROWTH MARKET

So how will adaptive learning address the challenge of developmental education drop-outs? The concept of adaptive learning is not new, but it has attained a new relevance. It means to “personalize” or “individualize” educational content to apply to the specific learner, each of whom has different learning styles and capacities. By combining technology, assessment, and content, adaptive learning enables personalized instruction to scale at the classroom level so that students can learn at their own pace, thereby freeing faculty to help in other areas of need. This not only accelerates the learning process through targeting but also helps engage students through the continuous process of computer-guided learning and assessment. Whereas the creation and delivery of digital content drove innovation in educational technology in the recent past, assessment and data analytics emerge as the more critical components today.

In order for adaptive learning technologies to systematically deliver the right content to the right student at the right time, content, assessment, and analytics must be integrated to work together. Today, these disparate solutions – and in many cases, the providers themselves – are being brought together as entirely new solutions.

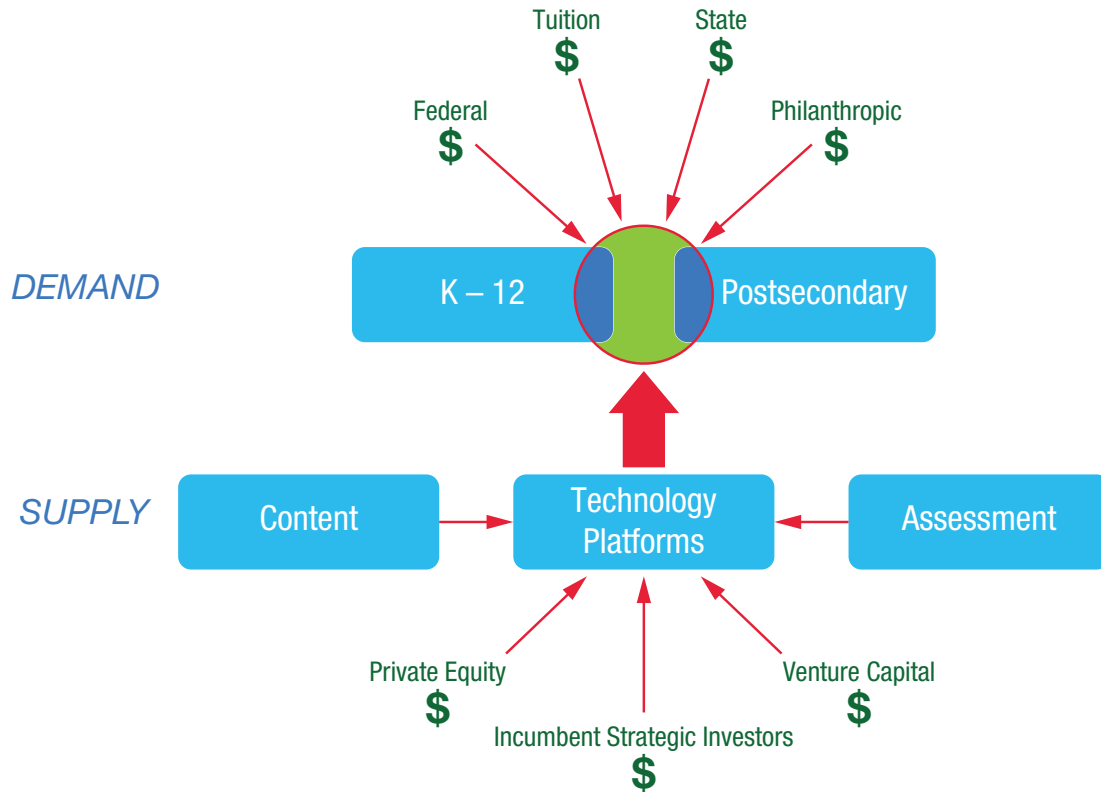
New Sources of Financing Facilitating Market Development

Figure 1 illustrates the sources of external finances fueling growth in this industry. In terms of public money, federal stimulus dollars coming from the American Reinvestment and Recovery Act of 2009 targeted \$100 billion to the education sector. While only \$650 million was earmarked for educational technology, the liquidity injected into the system helped it not only recover from the recession but also invest in improvements. In 2011, the U.S. Departments of Labor and Education created a \$2 billion fund that aims to help community colleges improve their ability to deliver education and career development programs over the next four years. Some of these funds, such as those designated for the Student Aid and Fiscal Responsibility Act, are directly targeted to remediation. Finally, in February 2012, President Obama announced the Community to College to Career Fund of \$8 billion, which is focused on more strongly linking community colleges with the workforce.

Private funding is coming from philanthropic organizations like the Gates, Lumina, and Carnegie Foundations through the Developmental Education Initiative, Achieving the Dream, and Developmental Math Initiative, respectively. While all three organizations directly address the need for improved remediation, the Gates Foundation’s commitment of \$110 million includes funds directed toward the use of technology to improve developmental education. Consequently, despite state budget cuts and a slow economy, there is new money in this industry, much of which is directed at schools and colleges. The key takeaway is that public and private funding has both direct and indirect effects on the funding of educational technology and developmental education initiatives.

Having taken notice of government and philanthropic concern regarding the state of developmental education, the financial community has taken significant interest in supporting vendors in educational technology. This includes private equity and venture capital funds, large publishers, and even global media conglomerates. Most of this money is directed toward the continuing proliferation of digital content, as well as improved administrative and classroom technologies. However, a significant share has been dedicated to entrepreneurs and early-stage growth companies attempting to find solutions for developmental education.

Figure 1. Adaptive Learning and the Developmental Education Opportunity



Evolution of a “Bridge” Market Connecting K-12 and Higher Education

As illustrated in Figure 1, educational technology providers often serve both secondary and postsecondary education, and companies are not only blurring product and service lines but market sector lines as well. Traditional boundaries between K-12 and higher education are eroding, and a new set of “bridge” markets is coming to take their place – more fully reflective of the shared and connected needs that both sectors of formal education have and more indicative of a lifelong learning context for students.

LEADING PROVIDERS

Companies that are delivering digital content to one market sector are merging with or being bought by companies that have complementary market or product strengths. This is being financed by third parties eager to establish market share. A few examples help illustrate who some of the different players are by segment:

Pearson, with a market capitalization of \$15 billion, is the world's leading education company. It also leads this market through its Pearson Learning Solutions division. As the largest provider of developmental education products and services, Pearson has shown that through organic growth, acquisitions, and partnerships, it intends to play aggressively in adaptive learning, developmental education, and the market segment of grades 9 to 14. It is already a leader in content and – to a lesser extent – in assessment and technology platforms. The company's innovativeness is driven in part by its overall acquisition strategy – at least six acquisitions in 2011 highlight its intention to absorb promising technology and expertise that it does not already own and monetize it through its massive distribution channel.

Pearson's growth strategy should position it for continued leadership in educational technology across the education value chain. The company is willing to take calculated risks in order to gain initial-mover advantage, especially in developmental education and adaptive learning technology, as evidenced by its partnership and ownership stakes in *Knewton* (adaptive learning technology), *Smarthinking* (remote tutoring), and *TutorVista* (remote tutoring). While these companies appear to operate independently of one another for now, they both illustrate industry dynamics worth mentioning. The initial focus of Knewton's adaptive learning platform is math, both because increasing numbers of college freshmen need to take developmental math courses and because it is receiving particular attention from policymakers, funding sources, and other stakeholders. Pearson's investments in (U.S.-based) Smarthinking and (India-based) TutorVista are also applicable to developmental education, where they bridge traditional personal instruction and the emergent technology-mediated model. While online tutoring is still developing market scale in the United States, in a limited respect remote tutoring blazed the trail that adaptive learning technologies are on today.

Carnegie Learning is a company focused on adaptive math instruction that can be used by both developmental and non-developmental students in secondary and postsecondary markets. Originally founded in 1998 at Carnegie Mellon University, the company was recently purchased by Apollo Group, the nation's largest operator of for-profit postsecondary schools, including the University of Phoenix. Apollo's strategy is to incorporate the Carnegie Learning technology, named Cognitive Tutor, into its current postsecondary learning platforms and continue rolling it out into the secondary and postsecondary education markets. Carnegie Learning is a good example of a company on the leading edge of innovation in analytics and adaptive learning technology. With estimated annual revenues of \$30 million, Carnegie Learning is poised to be one of the first companies to achieve commercial success in adaptive learning.

PLATO Learning (recently merged with Archipelago Learning and collectively renamed as "*Edmentum*") is a publisher with strengths in the middle and high school digital content market and is best known as an early disrupter of the big K-12 publishing firms: Pearson, McGraw-Hill, and Houghton Mifflin Harcourt. Edmentum's owner, Thoma Bravo LLC, a private equity firm, is known for industry-consolidation investing by which it seeks to create value through industry dominance. Edmentum's growth strategy is focused on broadening its educational portfolio to include traditional K-12 and postsecondary education. It has chosen to downplay its historical presence in developmental education and focus instead on developing more advanced assessment technologies without the use of partnerships. At an estimated \$150 million in annual revenues, it is accumulating market share along the K-16 educational value chain and is a good example of a midsize provider focused on the broad digital content opportunity. The challenge for Edmentum will be to take advantage of the developmental education opportunity while spreading itself across multiple other lines of business and markets.

Today's Challenge: Clearly Communicating the Value of Adaptive Learning

While companies like Pearson, Carnegie Learning, and Edmentum are offering a potential answer to the challenges posed by developmental education, they are also causing confusion for buyers of these solutions. Schools require further education about which products will really help improve student learning outcomes, what capabilities are most important, and what these solutions are worth. At present, there are many digital alternatives being offered, and in their rush to establish market share, providers are attempting to offer the same content to both high schools and colleges. Adding to the confusion, the distinctions between developmental and traditional education are also becoming blurred. Providers need to take care to fit solutions to institutional needs to drive adoption and use, not just purchases.

NEXT STEPS IN MARKET EVOLUTION

For this market to further develop, one of the key challenges is the inertia of two multibillion-dollar systems. School districts and universities are governed, managed, and financed differently; even providers of similar products and services are often distinct because of the different sales channels in each market sector. One of the most important levers that may blur these traditional lines is the recently developed Common Core Standards, a state-led initiative that defines the knowledge and skills students need to attain during primary and secondary school years to allow them to succeed in college.

A major component of the Common Core Standards is that they are being developed in partnership with higher education, as well as with non-profit organizations such as ACT and the College Board, both of which are already familiar with the high-school-to-college bridge through their respective college admissions and placement exams (both also have partnerships with Pearson). To date, the Common Core Standards have been adopted by most U.S. states, and industry providers are busy trying to include these standards within their offerings. The Common Core Standards will have a dramatic impact particularly on assessment markets and should pave the way for adoption of more technology-enabled content. However, there is no guarantee that the Common Core Standards will succeed, and it is unclear at this point how they will address the needs of developmental postsecondary learners.

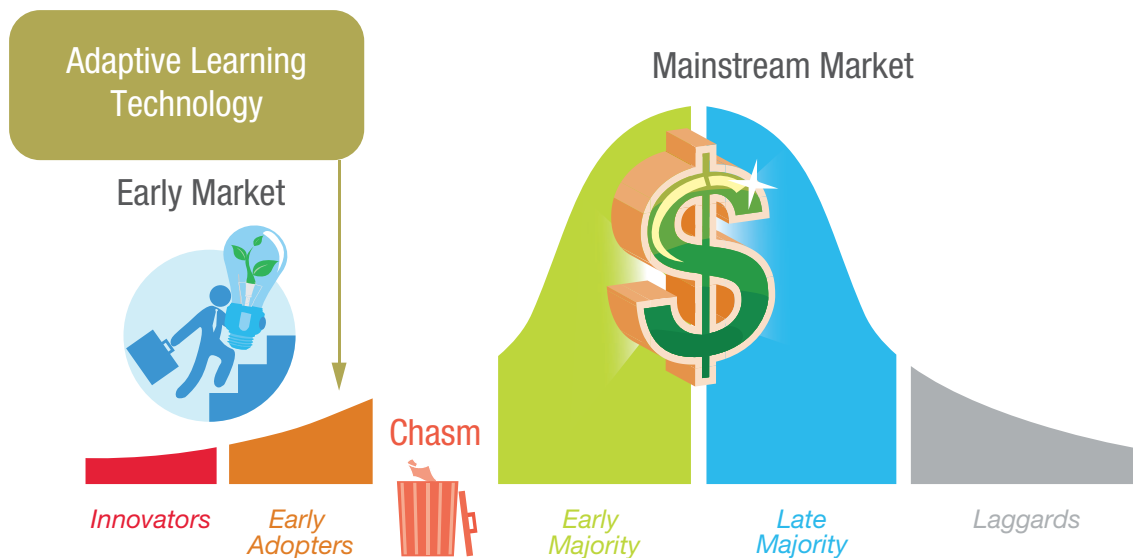
Considering students in grades 9 to 14 and their needs for college preparation at scale is a concept that needs to be further explored and developed by educators, third-party providers, and policymakers alike. Developmental education will initiate what is potentially a much broader change in education markets because it is where the greatest demand lies today. If adaptive learning technology can be delivered to add value where needed most, its providers will have invaluable opportunities to learn how institutions, instructors, and students interact with the technologies and use them to attain important goals. From the developmental education beachhead, leading providers of content, assessment, and technology that compete in adaptive learning will have a strong basis for scaling their products across a much wider swath of formal K-12 and postsecondary education.

Crossing the Chasm: a Framework for Understanding Market Growth

Geoffrey Moore's concept of "Crossing the Chasm" is instructive for the future development of adaptive learning in higher education. As illustrated in Figure 2, the bell-shaped curve that represents the life cycle of technology products or services includes a "chasm" between early adopters and the so-called

“early majority.” The chasm represents the most difficult stage of growth, where the market determines whether new product or service features championed by innovators actually represent what the early majority wants and needs. Companies, and even entire industries, have met their end in the chasm. The market for adaptive learning technologies is approaching the chasm, and we project it will cross it.

Figure 2. Crossing the Chasm



Source: Crossing the Chasm, Geoffrey Moore, 1991

Moving ahead, we expect that evidence of mainstream market acceptance of adaptive learning will include the following:

- ▶ **More – and more successful – providers.** Companies like Carnegie Learning and Knewton will grow by turning pilot/beta installations into full-paying customers. Furthermore, they will increase the rate at which they bring new clients onto their platforms to achieve scale.
- ▶ **More product choices.** Startups will create new products, while established players will enhance products and adjust their marketing mixes to make existing products more approachable to a mainstream market. This, in turn, will drive overall customer acquisitions.
- ▶ **More students succeeding.** Although evidence of student success will be far from conclusive in the next few years, anecdotal evidence will mount that adaptive learning works – for at least some subpopulations of students.

As adaptive learning technologies cross the chasm in developmental education, its impact in these and other dimensions will grow and the future of the market will be secured.



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