

ts insights

volume 5 no. 1 April 29, 2008

Crossing the K-12 digital divide: understanding and playing in a complex market

Public K-12 education in the U.S. has been slow to adopt digital solutions to enhance and tailor instruction and help teachers and school districts meet reporting and continuing professional education requirements. Although the use of digital technology is widespread in higher education, budget and bureaucratic constraints have limited its use in public primary and secondary schools. However, roadblocks are beginning to disappear as school districts look for better ways to comply with the No Child Left Behind Act (NCLB), and public pressure mounts to improve the performance of U.S. students relative to those in other developed nations.

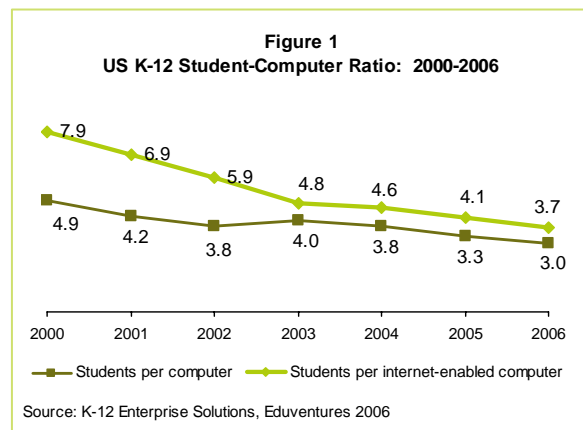
Impetus for change coupled with market fragmentation in many sectors has created opportunities for corporate and financial investors. Since relatively little market information exists to guide dealmakers, our goal is to shed light on this rapidly evolving market, identifying its major segments, the nature of the competition, and other things investors should know before entering this market.

MARKET OVERVIEW

“Digital solutions” is a general term that describes a range of technology used to enhance the delivery and administration of K-12 education, including data management systems, web-based course and assessment materials, and online tutoring and professional development. Because the U.S. market is fragmented and immature, with overlapping segments, there is little reliable information on the size of the digital educational solutions market. A 2000 Merrill Lynch study estimated the market to be \$1.3 billion at that time. The current market is \$5 and \$7 billion according to industry sources.¹ Key drivers of this growth have been the ongoing impact of NCLB, improving IT infrastructure, and the growing number of tech-savvy students and teachers.

¹ Moe and Blodgett, *The Knowledge Web*, 2000; Greaves Group, *America’s Digital Schools*, 2006; Eduventures; Simba Information.

Enacted in 2002, NCLB mandates annual testing of public school students in grades three through eight. While initially limited to English and mathematics, testing will include science this year. Schools that fail to achieve adequate yearly progress must provide additional educational services to students, while teachers in all public schools are required to meet continuing professional education requirements. Pressure on schools to ensure their students achieve



baseline proficiency on these tests has spurred demand for software that enables interactive, customized instruction and intervention. There is also some evidence that students who use classroom software do better on standardized tests than their peers, with the biggest gains among low-achieving students.

After NCLB, an improved school technology infrastructure is the second key driver of demand. Not only do virtually all public schools and 93 percent of classrooms have Internet access, but as of 2006, 54 percent of schools had wireless networks, 45 percent had video streaming, and 20 percent offered distance learning.² In addition, 26 percent of school districts were pursuing initiatives to give every student a computer, up from just four percent in 2003.³ The steady decline in the number of students per Internet-enabled computer has removed a major roadblock to school districts taking full advantage of the many digital educational solutions on the market.

The third element driving market growth is tech savvy students and teachers. Most of today's K-12 students are "digital natives" exposed to technology as toddlers and well equipped to take advantage of multimedia education. Most teachers are also open to digital solutions. In a recent study, 77 percent of high school teachers stated that technology helps students learn, and 28 percent were interested in having their school district offer online courses.⁴

As the market for digital K-12 education has grown, it has evolved in several ways. Since the 1990s, leading textbook publishers with longstanding relationships at state and local levels have included CDs and DVDs with their textbooks to deliver modular content, and many are now acquiring technologies that add value by incorporating assessment and analytical capabilities into instructional materials. Examples of this trend include Pearson's acquisition of eCollege, Effective Education Technologies, PowerSchool and Chancery over the past two years; McGraw-Hill's purchase of Turnleaf Solutions in 2005; and Houghlin

Mifflin Riverdeep's (HMR) purchase of Achievement Technologies.

The last ten years have also witnessed the emergence of niche players whose core strength is software development. Some that began by targeting higher education now target the K-12 market, taking advantage of relatively low barriers to entry. A variety of small entities, many with roots in academia, have also begun offering open-source instructional management systems to financially strapped school districts. Even large software and communications companies such as Intel and Verizon are offering free solutions through their outreach programs to create goodwill and gain an opportunity to sell proprietary solutions.

While these technology-based solutions vary in quality and sophistication, the best ones offer user-friendly training programs, efficient troubleshooting, strong customer support, and innovative design and functionality including plug-ins that give educators and administrators the flexibility to tailor applications to meet specific needs. This trend has put pressure on traditional publishers to either invest heavily in new product development or acquire "best in breed" technologies in strategically significant sectors of the digital educational solutions market.

MARKET SEGMENTS

Today, the market can be divided into three broad sectors: instructional materials and assessments, data management and analysis, and supporting services. While these sectors once had fairly distinct market and competitive dynamics, the lines between them are beginning to blur as companies such as Pearson strive to build fully integrated digital solutions capable of seamlessly assimilating digital products and services across sectors.

Instructional materials and assessments is the largest sector accounting for about half the digital education market. Approximately half of the sales in this sector come from CDs and DVDs bundled with traditional textbooks. However, growth in sales of such products is flat to slightly negative, and because such products are sold at little or no additional cost, they are often unprofitable in their own right.

² U.S. Department of Education, National Center for Education Statistics

³ Greaves Group, op. cit.

⁴ Project Tomorrow and Blackboard Inc., *Learning in the 21st Century: A National Report on Online Learning*

Comprehensive or adaptive courseware comprises the newer, more robust, more profitable part of the instructional materials and assessments market. These materials incorporate assessment capabilities and analytics to help teachers monitor students' progress during the year and tailor instruction to meet individual development needs. The market for these solutions is strong with industry sources projecting eight percent growth through 2010 as school districts seek new tools to help them meet annual performance targets. Leading textbook publishers—Pearson, HMR and McGraw-Hill—command over 60 percent of this market.

Data management and analysis is the second largest sector. The fastest growing part of this sector—accounting for around a third of the sector revenue—includes analysis and reporting tools that help educators modify lesson plans during the year by linking assessment results with prescribed interventions and relevant instructional materials. With schools that fail to achieve adequate progress for four consecutive years facing serious consequences under NCLB, the intervention sub-sector is expected to grow at double-digit rates through 2010.

The two other parts of this sector—student information systems and instructional management systems (IMS)—are expected to grow about five percent annually through 2010. Student information systems help schools manage student data, track attendance, monitor schedules and store relevant information such as student demographics. Stand-alone products in this sub-sector may be subject to margin pressures since there is both a clear market leader, Pearson, and numerous competing products capable of extracting data from legacy systems.

Originally developed for college professors, instructional management systems (IMS) are integrated platforms that help teachers create a collaborative learning environment that combines classroom and web-based instruction. Among other things, IMS help teachers plan lessons, communicate with students and parents, share and archive course content and test results, provide timely feedback, and customize instruction across subjects and grades. IMS have potential strategic importance because they can become central to teachers' working lives and thus can influence a school district's course content decisions.

While the IMS sector is forecast to experience only moderate growth in the next few years, its potential may be considerably greater. According to a recent study by Education Market Research, fewer than 20 percent of primary and secondary schools use an IMS, compared with two-thirds of U.S. universities. However, nearly half of U.S. school districts consider implementing an IMS a key priority.

Support services is the smallest sector of the digital educational solutions market. Sector sales are split evenly between professional development products for teachers and administrators, and online courses and tutoring. Online tutoring is the fastest growing segment of digital education, with annual growth estimated at 20 percent through 2010, again fueled by state-led educational programs and NCLB additional education requirements for underperforming schools.

Figure 2 summarizes the main segments of the digital K-12 education players in the market and discusses some of the issues facing each sector.

MARKET DYNAMICS

As the digital solutions market matures, we expect some shakeout and consolidation, as providers of “middle of the road” proprietary solutions get squeezed from above by companies with deeper pockets and more sophisticated products, and from below by innovative open source solutions. Meanwhile, major educational publishers will continue to acquire leading technologies, while mid-sized technology-driven companies (e.g., Blackboard, Plato, SchoolNet, and Angel Learning) may turn to acquisitions or joint ventures with other software or content providers to broaden distribution or strengthen their competitive position across the digital solutions spectrum.

With new technology continuing to blur the boundaries between academic and administrative functions, large corporate players face a strategic dilemma: should they invest in building a fully integrated suite of digital education solutions that offer school districts “one stop shopping”, or focus their efforts on developing high quality digital solutions in sectors where they feel they have a greater and less readily duplicated competitive advantage, such as IMS or assessment. Companies subscribing to the

Figure 2: Digital Education Market Segments

Sector	Key Players	Representative Open Source/Freeware	Investment Considerations
Instr. Materials & Assessments			
CDs/DVDs with texts	Pearson, HMR McGraw-Hill	Packaged with textbooks	Flat to negative growth, longstanding relationships between publishers and school districts.
Comprehensive courseware	Plato, Pearson, HMR, Compass, Scholastic	Moderate	Moderate to strong growth, rapidly developing technology and rapidly shifting competitive dynamics.
Data Management/Analysis			
Analysis & reporting tools	Fragmented, no clear leaders	Intel® Teach Program, Others	Moderate to strong growth, potential opportunity to capture share with distinctive products.
Student information systems	Pearson	Centre, Focus, Open Admin	Modest growth; product differentiation challenges; subject to price and margin pressure.
Instructional management systems	Pearson, Plato, HMR, BlackBoard, Angel Learning, SchoolNet	Moodle, dotlearn, Thinkfinity (Verizon Foundation)	Potential strategic advantage as portal to digital learning demand will influence growth. Must offer advantages over freeware. Targets for content providers.
Support Services			
Online tutoring/courses	Apex, Aventa, Florida Virtual High, Sylvan Online, Tutor.com	Low-cost or free services in many areas	Moderate to strong growth, but widespread presence of freeware and non-profit players likely to limit investment opportunities.
Professional development	Plato, Pearson, HMR	Thinkfinity	NCLB continuing ed. requirements could spur growth. Companies with PD solutions in other markets may be able to transfer skills into K-12 education sector.

Sources: Industry research, Eduventures, Simba, PwC estimates

first strategy (Pearson and, to some extent, HMR) are betting that educators will be quick to adopt a fully integrated digital solution as soon as advances in technology make this long awaited vision a reality. They also believe being first to market with a comprehensive solution will allow them to gain market share at the expense of traditional textbook publishers who do not offer a full suite of compatible academic, professional development and administrative software and support services.

However, the viability of a one-stop solution is a hotly debated topic among industry experts, with skeptics contending that the needs of school districts across the country are simply too diverse and complex to allow one company to deliver a full set of solutions. They believe companies should focus on maintaining their strengths and relationships in educational content, and leave technology-driven businesses such as storing and managing student information to niche players or larger technology based players such as the major data warehouses.

Irrespective of whether they are looking to build a one-stop shop model, many content providers are concerned that the value of their relationships with school districts could be undermined if they don't

acquire or partner with an existing IMS provider. Because IMS products can influence content selection, larger publishers and other content providers fear that if they don't develop strong offerings in this area, IMS providers could become middlemen between them and their customers. Consequently, expect to see acquisitions or joint ventures between textbook publishers and IMS providers, with publishers contributing deep industry experience, a national sales force and established customer relationships. In addition, players such as Blackboard, Angel Learning and Cengage who derive most of their business from higher education, but are beginning to expand into the K-12 market, may use deals to expedite this process.

A CAUTION FOR FINANCIAL ACQUIRERS

Over the past few years, financial buyers have played an active role in the digital education market. Financial investors have owned Houghton-Mifflin since 2002, with HM Rivergroup buying it in 2006 from a consortium that included Thomas H. Lee, Bain and Blackstone. In 2007, Edge Acquisition LLC bought Educate Inc., the parent company of Sylvan Learning, Catapult, and Hooked on Phonics, while

Apax Learning and OMERS Capital Partners bought Thomson Learning. Renamed Cengage, the company focuses on higher education, but is using an arrangement with HMR to distribute its college texts to high school honors and advanced placement courses.

While financial buyers are playing in some of the more fragmented, higher growth sectors of the digital solutions market where opportunities to build scale are considerable, they should evaluate a number of potential risks before closing a deal. First, potential acquirers should place particular emphasis on understanding the impact that a change in school districts' purchasing cycles could have on a

company's cash flow. In many instances this is likely to present risks to financing covenants, as K-12 purchasing cycles can be erratic and the financial histories of targeted technology companies are often short.

Second, given the number of proprietary, open source and free technologies on the market, acquirers should conduct thorough market and technology due diligence to ensure potential targets have genuinely distinctive platforms that can maintain their pricing structure and make significant share gains in this highly competitive market.



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- Evaluating the source and sustainability of revenues and margins

- Evaluating and challenging management forecasts in context of the company's business model and commercial environment
- Feedback from customers, competitors, regulators and other stakeholders on the current positioning of a business as well as potential risks and opportunities

Transaction Services Strategy is part of PricewaterhouseCoopers' Transaction Services Group which provides a full range of due diligence, capital markets, valuation and accounting advisory services that help companies use transactions to more effectively reach their business goals and improve returns on capital invested. With over 1,200 deal professionals in 16 U.S. cities, we can meet your company's needs whenever and wherever you are doing deals. For more information on how we can help you become a better-prepared acquirer, contact one of the Transaction Services Strategy specialists listed below:

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