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Taking education beyond the campus gates

e-Learning offers compelling ways for higher education to expand access without expanding the physical plant

A Datamonitor whitepaper

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www.datamonitor.com

Datamonitor USA
245 Fifth Avenue
4th Floor
New York, NY 10016
USA

t: +1 212 686 7400
f: +1 212 686 2626
e: usinfo@datamonitor.com

Datamonitor Europe
Charles House
108-110 Finchley Road
London NW3 5JJ
United Kingdom

t: +44 20 7675 7000
f: +44 20 7675 7500
e: eurinfo@datamonitor.com

Datamonitor Germany
Kastor & Pollux
Platz der Einheit 1
60327 Frankfurt
Deutschland

t: +49 69 9750 3119
f: +49 69 9750 3320
e: deinfo@datamonitor.com

Datamonitor Asia Pacific
Darling Park
Tower 2, Level 21
201 Sussex Street
Sydney NSW 2000
Australia
t: +61 2 9006 1526
f: +61 2 9006 1559
e: apinfo@datamonitor.com

Datamonitor Japan
Wakamatsu Bldg 7F
3-3-6 Nihonbashi-Honcho
Chuo-ku
Tokyo 103-0023
Japan
t: +813 6202 7681
f: +813 5778 7537
e: jpinfo@datamonitor.com

ABOUT DATAMONITOR

Datamonitor plc is a premium business information company specializing in industry analysis.

We help our clients, 5000 of the world's leading companies, to address complex strategic issues.

Through our proprietary databases and wealth of expertise, we provide clients with unbiased expert analysis and in-depth forecasts for six industry sectors: Automotive, Consumer Markets, Energy, Financial Services, Healthcare, Technology.

Datamonitor maintains its headquarters in London and has regional offices in New York, Frankfurt and Hong Kong.

BEYOND THE CAMPUS GATES

While distance learning is hardly a new phenomenon in education – correspondence courses have been offered for decades if not centuries – the more widespread and substantive adoption of e-Learning is a relatively new one. Access to online courses, both those that are delivered entirely online and those that are comprised of online and classroom components, is growing rapidly. Moreover, these courses are increasingly using advanced technology, such as video-conferencing and content authoring tools, to make the online educational experience as engaging, if not more so than those in traditional campus settings.

The growth of e-Learning offers education institutions the potential to address pressing equity of access questions, particularly for rural and non-traditional students for whom online learning is often their best, or even only, option for obtaining an education. Yet while the benefits of adopting e-Learning applications and solutions are considerable for education, there are a number of challenges that institutions must address in order to realize the full benefit from online learning.

This whitepaper will explore the issues driving the adoption of e-Learning as well as the questions that must be answered in order for e-Learning to expand education beyond the campus gates and to transform teaching and learning.

The education eco-system is poised for the more rapid and substantive adoption of e-Learning

Including both institutional and external motivations, the set of factors driving the uptake of e-Learning is large and complex. From a purely pedagogical perspective, the belief that technology is a powerful tool for customizing instruction to the needs of individual students is widely held amongst educators. Educators will often reference technology as having the unique potential to help them overcome the challenges associated with effectively teaching a large and diverse group of students. From a demographic standpoint, the percentage of individuals for whom using technology is an assumed rather than novel activity continues to grow, shifting the balance of institutional power toward educators who have only known a digital world. As these individuals populate education institutions, the purchase and adoption of online learning technology will move forward rapidly. Finally from a purely cost viewpoint, the adoption of educational technology offers institutions attractive tools to scale their

offerings while maintaining costs. Datamonitor believes that there are three key factors driving the more widespread adoption of e-Learning, including:

- Government policies are driving more educators to tailor their instruction to the individual needs of students;
- Technology has come to be an expected component of higher education; and
- Online learning offers a solution to the challenge of increasing access while maintaining costs.

Recent government are prompting educators to take a closer look at institutional effectiveness

After years of relatively little influence beyond the provision of federal financial aid, the US Department of Education has recently taken steps to establish a more active role in the oversight of higher education. While in the past, federal oversight would have focused largely on regulations related to institutional inputs and outputs, such as ability-to-benefit requirements for admissions or default rates for participation in financial aid, this new round of interest is focused on improving institutional processes and effectiveness.

Convened in 2005, the Commission on the Future of Higher Education, also known as the "Spellings Commission" was charged with the task of creating a set of recommendations on how to improve US higher education. In fall 2006, the commission released a report entitled, *A Test of Leadership: Charting the Future of U.S. Higher Education*, which organized its recommendations around the four ideas of access, accountability, affordability and quality. In numerous presentations and press releases, Commissioner Spellings clearly communicated her hope that the Commission's report would help her to work with the Congress to apply the lessons-learned from the No Child Left Behind (NCLB) policy in K12 to higher education. Given the prominent role of standardized testing and sanctions for poor performance on them in the NCLB policy, it is this assertion that suggests the US Department of Education will focus on academic processes in higher education.

It is largely for this reason – the application of K12-type accountability policies to higher education – that Datamonitor anticipates that educators will be taking a closer look at their institutional effectiveness, particularly around teaching and learning. Online learning offers compelling ways for institutions to improve instructional effectiveness, increase access and track institutional performance over time. With the possibility of individualized instruction, space for collaboration with peers and

direct access to faculty, e-Learning greatly enhances the instructional experience and increases the likelihood of positive academic outcomes for students.

Technology has come to be an expected component of higher education

While the public once marveled at gleaming computer laboratories or Internet access in student dormitories, it now increasingly expects that WiFi is broadly available on campus, registration is online and campus tours are virtual ones. While the reality of many education institutions does not entirely support this expectation, over the past five years the accessibility and robustness of technology in higher education has made considerable progress.

Often credited with the creation of the Internet, higher education has a much longer history with the use of instructional technology. As a result, postsecondary institutions are more likely to meet constituent expectations for the availability and usage of educational technology than institutions at the primary or secondary school level. Nevertheless, in order to meet the expectations of external constituents, institutions at both levels, regardless of their progress with implementing technology, must continue their investments in educational technology.

Having grown up with technology, the millennial generation expects to use it as a tool for learning

Propelled by media coverage and rapid technology adoption in the consumer market, the idea that students prefer to learn with the aide of technology has become part of the popular consciousness. Despite the absence of definitive research concluding that students learn more effectively with technology, the belief that they do seems to have edged from opinion into 'fact' with few questions. While it is beyond the scope of this paper to consider why the public believes so strongly that when instruction is computer-based students engage with it more actively, it is fair to suggest that the seemingly constant usage of technology by students is contributing to this belief. According to a recent study by the Pew Internet and American Life Project, in 2005, 87% of US teens reported that they use the Internet, 51% use it everyday and 84% have some sort of media device, including desktop computers, laptops, cellular phones or personal digital devices. It is, therefore, not surprising that the public has made the leap from seeing students' higher general usage of technology to believing that students also prefer to use technology for learning. As education institutions are eager to find new ways for engaging students more actively in learning, they will be

willing to invest in online learning solutions and applications that meet the perceived preferences of students.

It is also important to recognize the new and different ways that the Internet is being used by the millennial generation and the implications from these types of usage for online learning. Not only does this generation of students expect the Internet to be "always on," but also that it is a tool for interaction and collaboration rather than simply data collection. Consider the rise of social networking and such popular websites as MySpace and Facebook. Students go to these sites to exchange information, arrange logistics and collaborate on ideas. While these activities are often for social rather than educational purposes, it is not difficult to see the commonalities between what students do on MySpace and how one would describe the most effective teaching and learning environment. The question, however, is how can educators harness what we know students like about social networking and apply it to online learning.

Figure 1: The millennial generation has high expectations for technology

Source: Datamonitor

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As the baby boom generation retires, the next generation of faculty will only know a digital world

With the retiring of the baby-boom generation, the proportion of newly hired faculty that has no recollection of a world without the Internet will continue to grow. Having been born after the founding of Apple Computers and graduated from secondary school after the burst of the dot-com bubble, these individuals have only a limited memory of a time when the Internet did not support and enable the daily activities of life. Consequently, the next generation of faculty will expect to use technology for supporting administrative tasks, instruction and student communications in a way that few do today. Moreover, these individuals, in many cases, will not know of any other way besides using technology to conduct these activities. For example, the faculty of tomorrow will have only accessed course syllabi through an online learning management system (LMS), such as *Blackboard* or *eCollege*. A web-cam will be viewed as a simple peripheral that even a child could use rather than a cutting-edge piece of technology solely for business people. As this new generation of faculty moves into institutional leadership and decision-making roles, not only will it accelerate the uptake and more sophisticated usage of e-Learning, but decrease the cultural hurdles to its implementation as well.

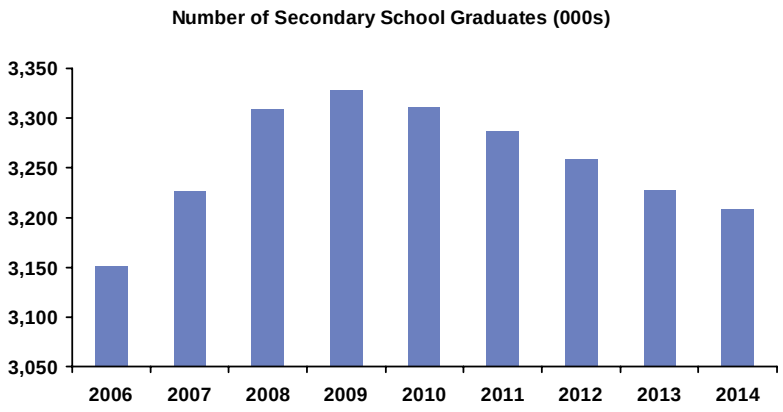
Online learning offers a potential solution to the challenge of increasing access while maintaining costs

Education institutions have been keen to invest in online learning programs because these programs offer a way to increase student access without the subsequent need to expand the physical plant. Adding virtual classrooms, when done effectively, is far less expensive than adding physical ones.

While a number of well-known institutions have billion dollar endowments reducing their tuition dependency, the majority of institutions have far smaller endowments making them crucially dependent upon tuition revenue to balance their budgets. As the growth in the number of secondary school graduates slows over the next five years and both domestic and international competition accelerates to recruit them, institutions will increasingly seek out new student markets. Targeting the growing non-traditional student market will be a particularly attractive strategy to increase institutional enrollments, but at the same time will require institutions to become more willing to provide instruction in formats other than daytime, on campus lectures. Creating a larger number and more diverse set of online programs is an important part of this transition for institutions. Online learning offers non-traditional students attractive ‘anytime – anywhere’ flexibility for their studies, enabling them to login to

their online courses after they have put their children to bed, come home from work or any other time that is convenient to them. Yet, in order to meet the needs of non-traditional students more fully, institutions must support a diverse set of online programs, rather than just those that are most amenable to packaging in an online format. As institutions expand and develop their online offerings, they will fuel continued growth and expansion in the online learning market.

Figure 2: After 2009, the number of secondary school graduates will begin to decline



Source: National Center for Education Statistics

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A few loose ends remain for e-Learning

While powerful forces are driving the uptake of e-Learning by higher education institutions, significant hurdles are mitigating their strength. The combination of shifting public perceptions of and priorities for educational technology and the inherent difficulty of embedding its usage more deeply within the classroom is prompting many educators to reconsider their unbridled enthusiasm for investing in educational technology. In no way does this suggest that the education institutions will stop purchasing or drastically reduce its investment in e-Learning. Instead, institutions will exhibit increasingly conservative purchasing behavior by requiring vendors to provide appealing pricing strategies, evidence that solutions are effective and direct alignment between the solution's functionality and existing instructional

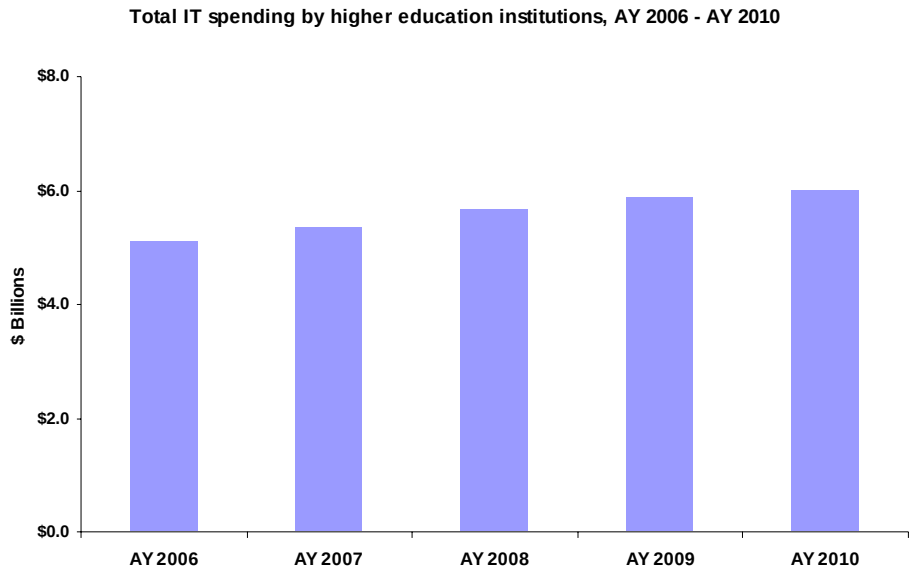
practices. If vendors are able to meet these requirements, these hurdles to the more substantive adoption of educational technology will be only short-term ones and overcoming them will usher in a new era of more robust technology uptake. Datamonitor believes that there are three important inhibitors to the uptake of educational technology, including:

- Technology purchases must compete with other priorities for increasingly scarce budgetary resources;
- A "wobbly" IT infrastructure can make e-Learning a house of cards for education institutions; and
- Moving to the next level of technology adoption requires significant and difficult behavioral changes.

Technology purchases must compete with other priorities for increasingly scarce budgetary resources

Rising fixed costs are undermining the ability of institutions to invest in e-Learning. Healthcare and energy costs have risen rapidly, placing considerable pressure on the already tight budgets of education institutions. Moreover, as faculty salaries account for a significant proportion of institutional spending, few budget areas exist from which institutions can reallocate spending to compensate for these rising costs. Given these factors and others, Datamonitor forecasts that education spending on IT in the US will grow at only a modest rate over the next five years. Spending by higher education institutions will increase to $6.0 billion by 2010 with a compound annual growth rate (CAGR) of 4.1%. As a result, institutions will have little flexibility to invest in new educational technology solutions as they struggle to maintain their existing programs. Online learning solutions that offer innovative pricing strategies or cost-saving delivery models will be particularly attractive in this context of continued budget austerity.

Figure 3: IT spending will grow at a somewhat austere pace over the next five years



Source: US Education IT Forecast (IMTC0033)

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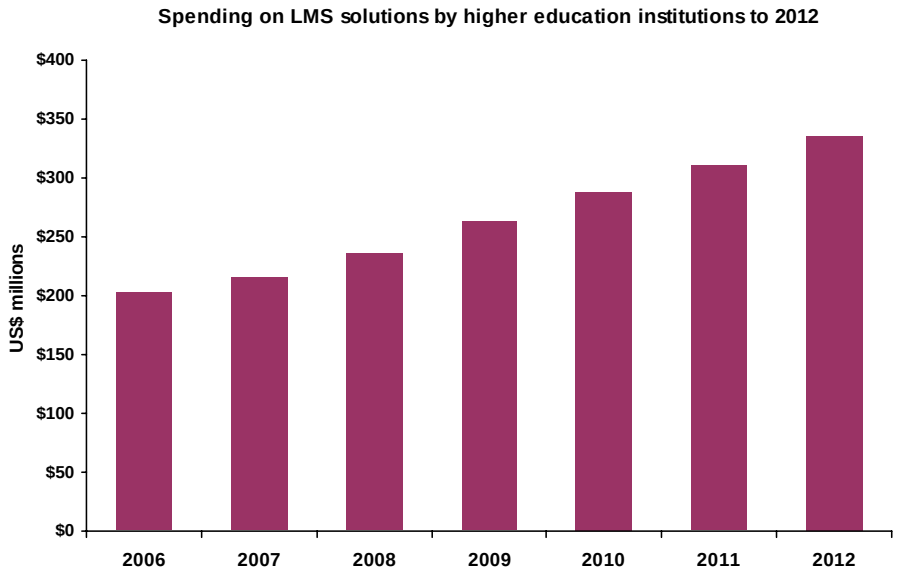
But e-Learning has become a mission-critical application for higher eduction

Although higher education is in a period of relative budget austerity in terms of technology spending, learning management systems (LMS) have quickly become the next "mission-critical" application on campus, in line, from a priority perspective, to the student information system (SIS) and enterprise resource planning (ERP) solutions. Moreover, unlike the SIS and ERP, the LMS is tied closely to an institution's core mission – teaching and learning – and therefore faculty and students depend on the LMS far more on a day-to-day basis than other solutions. As a result, an unplanned outage of the LMS would touch a far larger percentage of the institutional community, in a more substantive way than either the SIS or ERP.

Even though the US higher education market has near universal adoption of LMS from a "named institution" perspective, over the next six years spending on LMS will continue to grow as institutions both broaden and deepen their adoption of the solution area. Institutions will find reporting tools and functionality to support more

advanced pedagogical techniques will be particularly attractive in this market and contribute to spending growth. Datamonitor estimates that spending on LMS will grow from $215.6 million in 2007 to $334.9 million by 2012 with a compound annual growth rate (CAGR) of 9.2%.

Figure 4: Spending on LMS by higher education will grow rapidly



Source: Capturing the Global Market for Educational Technology (BFTC1429) DATAMONITOR

A "wobbly" IT infrastructure can make e-Learning a house of cards for education institutions

As the adoption of e-Learning grows, new and more strident demands will be made upon the institutional IT infrastructure which may or may not be ready to answer these demands. Over the last decade education institutions have invested heavily in the development of their networks, adding bandwidth and coverage, yet at the same time, the appetite for both of these network characteristics has grown at an even more rapid pace. In some ways, institutions are peddling faster and faster but are staying in the same place when it comes to their networks.

Without question, one of the strongest drivers of this appetite is online video. Both educational and commercial content is rapidly being made available as video either in a streaming or podcast format. iTunes, as well as its sister solution iTunesU, and YouTube are excellent examples of the massive amount of content that is currently available. Consider, however, the impact on an institutional network of an entire freshmen biology class simultaneously downloading a 4-minute video on photosynthesis or students throughout the day watching videos from homecoming on YouTube or even uploading their own videos while in the computer laboratory. In order for e-Learning to meet the expectations of these millennial generation students, video must be a key component of it. But if the network is unable to deliver adequate levels of performance to view or create these videos than the likelihood students will realize the full educational benefit from it are seriously undermined.

Many institutions will realize considerable value from collaborating with vendors, such as AT&T, to overcome the challenges of providing sufficient bandwidth and video capabilities to support online learning. Through partnerships with video and voice-conferencing solutions providers such as Polycom, Tandberg and VBrick, AT&T leverages its global MPLS IP-enabled network to provide education institutions with a robust, fully hosted network infrastructure and cutting-edge applications to enable online learning.

After bandwidth, ensuring network security is a perennial issue for higher education that has the power to bring down e-Learning like a house of cards. As student remotely access the institutional network, increasing the sites from which a denial of service (DoS) attack or infiltration of the network can occur, firewalls and bundled anti-virus, IDS, IPS, spam and email filtering are all necessary part of an e-Learning implementation. The area of deployment for security solutions can no longer be found at the perimeter of the network, as the perimeter is no longer a fixed entity. With the adoption of e-Learning, the importance of internal and inter-departmental firewalls is highlighted and the safe storage of confidential information must be maintained.

Further exacerbating the challenge of IT security is that with the more pronounced, differentiated access required by faculty, staff and students, either remotely or on campus, a tight yet realistic security policy needs to be followed. Authentication and authorization tools will be a critical part of securing the IT infrastructure, especially for remote access sign-on.

A potential way for education institutions to address both bandwidth and network security issues is to explore fully hosted solutions. By outsourcing their IP network to a vendor, institutions are able to access cutting-edge technology, better up-time and

performance and more effective security at a far more affordable cost than if they had attempted it on their own. AT&T, for example, has one of the largest global IP networks with leading security solutions and reliability. When a vendor, such as AT&T, manages the institutional network, educators are able to spend less time worrying about network constraints and risks and spend more time on educating students.

Transforming instruction requires consistsent and effective professional development

Embedding e-Learning more deeply within the core institutional mission of teaching and learning requires faculty to move their instructional practice beyond simply accommodating technology to fully leveraging it within their daily practice. This type of change is fundamentally dependent upon them making substantive and often difficult changes in their beliefs about what constitutes effective pedagogy. Historically, education institutions and faculty have been particularly resistant to reform initiatives that require exactly these types of changes. A common saying amongst educators is that the most successful educational reform of the 20th century is the move from blackboards to green boards. While witty, this saying has profound implications for the most substantive use of online learning. Overcoming increasingly scarce resources and shifting policy priorities will require that these solutions take a more central rather than supporting role in the classroom. Supplemental or ancillary roles are unlikely to provide sufficient value to motivate institutions to make additional investments in online learning. Only when online learning moves fully into the mainstream of instructional activities and is used by the majority of faculty on a regular basis will it be immune to budgetary constraints. It is important to note, however, that LMS has already made important strides towards obtaining this type of budgetary status and online learning should not be far behind.

Founded in 1995 as a philanthropic program, AT&T's Education Advocate program is an excellent example of how vendors and education institutions can work together to professional development to faculty so that they can more effectively leverage technology in their daily instructional practice. Using both in-person and online pedagogical techniques, the advocates work directly with institutions and faculty to learn how to best use online and e-Learning in their classrooms. As part of this program, for the past 12 years AT&T has developed and maintained the Knowledge Network Explorer service (www.kn.att.com) which reviews educational content and then puts it in a useable format for online learning activities.

APPENDIX

Abbreviations

AYP – Adequate Yearly Progress

CoSN – Consortium for School Networking

DoS – Denial of Service

ERP – Enterprise Resource Planning

FY – Fiscal Year

IDS – Intrusion Detection System

IPS – Intrusion Prevention System

ISTE – International Society for Technology in Education

LMS – Learning Management System

NCES – National Center for Education Statistics

NCLB – No Child Left Behind Act

SIS – Student Information System

Ask the analyst

Nicole Engelbert

Senior Analyst, Education and Vertical Markets Technology

Datamonitor

E: nengelbert@datamonitor.com

T: (212) 652 – 5301