

DIGITAL TRANSFORMATION IN HIGHER EDUCATION

Securing and Mobilizing Digital Learning Environments
to Enable Limitless Learning

BREAKING BARRIERS

Academic institutions have always found ways to push boundaries. Today, the ability to rapidly adopt new learning, teaching, and business models have department heads conferring with campus CIOs to more aggressively pursue IT and business transformation initiatives that improve offerings while also reducing costs.

Although once sufficient, siloed IT systems are no longer suitable to address new learner demographics and demands nor to thwart increasingly advanced cyber threats. The rise in non-traditional over traditional student enrollment and online learning as an integral part of the educational landscape requires IT teams at academic institutions to adopt more modern, integrated approaches that enable limitless learning. Key to success is simultaneously reducing IT complexity across student learning, faculty teaching, advanced research, and collaborative work environments, as well as protecting student privacy, financial data and transactions, health services data, and the myriad of other sources of sensitive information in higher education.

“Today’s average student is no longer the 18-year-old whose parents drive her up to ‘State U’ in a minivan stuffed with boxes. Instead, the ‘new normal’ student may be a 24-year-old returning veteran, a 36-year-old single mother, a part-time student juggling work and college, or the first-generation college student. The faces we picture as our college hopefuls can’t be limited by race, age, income, zip code, disability, or any other factor.”¹

TED MITCHELL

FORMER UNDER SECRETARY, U.S. DEPARTMENT OF EDUCATION

This paper provides guidance about what’s needed to ensure academic institutions secure and mobilize digital learning and working environments at lower costs. It illustrates how academic institutions are using VMware solutions to reduce IT complexity and cost while improving performance and efficiency by modernizing core IT platforms. It addresses how learning leaders and campus IT are teaming with VMware to scale and improve services with integrated hybrid clouds; provide anytime, anywhere access from any device to required education resources through the digital workspace; and mitigate threats while protecting academic brands by transforming security and compliance.

Accelerate Digital Transformation in Higher Education

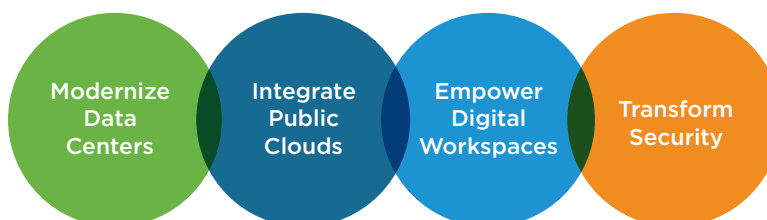
Grow Revenue, Drive
Operational Efficiencies,
and Reduce Costs



Mobilize Learning
and Retain Students



Improve Data Security
and Protect PII and IP



TRANSFORMATION DRIVERS

There is no denying education's future is digital. Four in ten (42 percent) college students report using two or more devices during an average school day.² Globally, mobile data traffic has grown 18-fold over the past five years. By the year 2019, there will be nearly 1.5 mobile devices per capita (a total of 11.5 billion), exceeding the world's projected population (7.6 billion) at that time.³

Collectively, campus IT's role is primarily to satisfy student and faculty demands for secure access to the apps and data they need, but they are not the only constituents. IT staff must invest time maintaining, updating, and upgrading software that supports the business of education—from financial aid and development offices to campus security. Because many traditional teaching resources, learning platforms, and campus operations still depend heavily on legacy applications to run critical processes, academic institutions incur more maintenance costs and exposure to risks than necessary.

Investment in digital transformation enables academic institutions—from community colleges to research universities—to introduce better ways of learning, new experiences, and inventive business models that drive successful outcomes. Yet no campus IT team wants to start over, which is why VMware accelerates digital transformation with a software-defined approach that enables efficient evolution from legacy applications to a future-proof infrastructure that ensures security from the data center to the device.

VMware provides unprecedented freedom and flexibility in how campuses build and evolve their IT environments. The VMware Cross-Cloud Architecture™ enables academic institutions to seamlessly extend their data centers by running, managing, connecting, and securing any app on any cloud—private or public. VMware's secure digital workspace solutions provide anytime, anywhere, any device access to data and information, improving learning engagement and productivity.

“VMware technology has enabled us to improve and increase services to students at no additional cost. Those saved funds make it possible for us to provide other services, academic and support services, that we otherwise wouldn't be able to provide. For other universities who may be contemplating similar changes—I would strongly encourage them to do so.”

CLIF FLYNN

SENIOR VICE CHANCELLOR FOR ACADEMIC AFFAIRS, UNIVERSITY OF SOUTH CAROLINA UPSTATE



MODERNIZE IT INFRASTRUCTURE, PROCESSES, AND APPS

Modernize
Data
Centers

Over the last generation, college enrollment has increased⁴ due to economic recession, deindustrialization, and increasing demand for skilled workers. Greater and more diverse participation in learning has brought challenges and opportunities to higher education. A software-defined data center (SDDC) approach provides the foundation for an evolutionary modernization of core education platforms that deliver more responsive and student-centered operating models through automation and IT as-a-service capabilities.

Virtualizing Beyond Servers

For nearly two decades, academic institutions have lowered capital expenses by consolidating data center infrastructure with VMware server virtualization. Now, they are further reducing legacy infrastructure costs and risks while improving operational efficiency with virtual compute, storage, and management in a tightly integrated software stack. Hyper-converged infrastructure (HCI) lowers TCO by shifting to low-cost, high-volume server economics and simplifying management. An ideal foundation, HCI offers powerful, high-performance infrastructure anywhere—for example, for makerspaces—without academic institutions' having to build dedicated computing spaces in libraries or other facilities.

Broadening IT Automation and Simplifying the Student Experience with SIS Integration

Campus IT teams are modernizing data centers to optimize for performance, availability, and cost. For more efficient app and infrastructure deployment, monitoring, and maintenance across physical, virtual, and cloud environments, they are relying on intelligent operations management and automation. They are creating policies in VMware vRealize® Automation™ and VMware NSX® to deliver workloads, apps, and compute services with network and security services attached. For campus IT teams that have already invested in an Ellucian Student Information System (SIS), VMware's Connector for Ellucian automates and updates the delivery of apps and resources to student digital backpacks based on their course loads. As students add and drop classes throughout their academic careers, their digital backpacks seamlessly reflect their academic journeys.

Supporting Legacy Apps and Running Modern Apps

In support of online and new educational models, IT is tasked with evolving legacy apps and enabling the delivery of modern apps. VMware solutions simplify legacy app deployment and migration by isolating apps from underlying operating systems (OSs) to eliminate conflict and streamline delivery and management. VMware investments in open source technologies such as Photon OS™ also enable academic institutions to securely build, run, and manage cloud-native apps on infrastructure as easily and cost effectively as legacy apps.

“As an open enrollment environment with more than 30,000 students pursuing traditional education, continuing education and professional development across more than 70 study areas, **Schoolcraft College** operates in one of the most diverse and dynamic learning environments. This new solution for Ellucian from VMware will help us deliver a secure and consumer-simple experience to our students while streamlining our costs.”

PATRICK TURNER

VICE PRESIDENT AND CHIEF INFORMATION
OFFICER, SCHOOLCRAFT COLLEGE

EMBRACE THE PUBLIC CLOUD

Experts have suggested the best way for universities to compete is to innovate, adopting fluid architectures that encourage online learning and partnerships with private industry. The physical setting for a large-scale research effort involving many parties can vary from multiple concurrent settings that include university labs, corporate centers, and national labs to a single dedicated research campus community.⁵ Modern IT-as-a-service capabilities, cutting-edge research environments, supercomputing, virtual labs, and creative learning spaces are best enabled by hybrid cloud services.

Scale to Expand Online Learning

A five-year study at the University of Massachusetts found that the blended structure (face-to-face plus online learning) led to increased engagement with course material which promoted more active learning during class meetings and ultimately improved student success.⁶ A multiyear trend report by the Babson Research Group shows growth in online enrollments continues to outpace overall higher education enrollments.⁷ Universities are turning to public clouds to fortify and future-proof their data center models. Investments in VMware Cloud Foundation™ and OVH are giving higher education IT leaders the unprecedented ability to move workloads and applications into and between clouds, creating new opportunities to affordably meet the expanding needs of online learning and cutting-edge academic research—without downtime and all while keeping cross-campus data secure.

Reducing Space and Cost Requirements with Virtual Labs

To make learning more accessible and affordable, universities are also relying on the hybrid cloud to enable virtual computing labs—with high-performance applications such as computer-aided design apps—both on campus as well as on the go, on systems of students' choice. VMware's solution provides an exceptional user experience and high-performance graphics virtualization powered by NVIDIA GRID, for the ever-expanding list of graphics-intensive software applications. Through virtual labs, students have more access to lab time, improving overall experiences and helping college departments grow remote and online learning experiences as additional revenue streams. The solution also makes it possible for higher education institutions to accommodate more students without adding new buildings and infrastructure.

Maximizing Uptime for Learning and Research Environments

Moving to cloud infrastructure has also been a way for IT leaders to help respond to today's performance, manageability, and security challenges. While minimizing downtime and keeping IT in control, VMware cloud solutions enable decentralized departmental decision makers to support their own diverse program needs.

“Making a very consistent experience for everyone means **we're breaking down some of the barriers** that we've had in the past about accessibility to resources. That is something we're very excited about.”

MARK ELLERSICK
TECHNOLOGY SUPPORT ANALYST,
WESTERN CAROLINA UNIVERSITY

CREATE EXCEPTIONAL MOBILE EXPERIENCES

Empower
Digital
Workspaces

Learning today is less about place and more about purpose. The modern campus depends on connectivity and collaboration, not just physical spaces. Globally, device diversity is a campus reality. For campus IT, the job isn't just to deliver apps to disparate devices, but to ensure seamless experiences between them.

Secure Anytime, Anywhere, Any Device Access to Digital Learning Environments

Regardless of where a student is working—on or off-campus—the VMware Secure Digital Backpack for Education, powered by VMware Workspace ONE™, provides secure access to all of the resources students need. It simplifies IT management and the reliable delivery of today's high-performance learning environments with relevant native, web, and 3D applications, that personalize user experiences and help evolve teaching models.

The Digital Backpack drives down campus capital and operating costs, streamlines IT management, and safeguards data. It uniquely combines desktop and app virtualization, enterprise mobility management, and centralized identity management. The user-simple and enterprise-secure solution drives teaching and learning initiatives campus-wide by delivering a consistent user experience to any app through VMware AirWatch® and VMware Identity Manager™ from a unified app catalog. IT sets self-service policies and credentials across bring-your-own (BYO) and campus-issued, personally-enabled (COPE) devices to increase productivity while ensuring data remains secure in the data center.

Academic institutions seeking to meet on-demand education requirements are also deploying virtual desktop infrastructure (VDI) to modernize computing infrastructure and offer secure digital workspaces to all faculty, students, and staff. Highly reliable and secure, VMware Horizon® improves productivity while reducing IT management.

Simplified Windows 10 Migration and Efficient App Delivery and Management

Traditional approaches to Windows management have been complex, costly, and restricted. AirWatch provides a cloud- and mobile-centric approach that simplifies Windows 10 device management and security with cost savings for all departments—especially those requiring automated patching of productivity apps. Desktop app management and associated packaging has also been a major campus IT expense. VMware reduces costs with a just-in-time app delivery and lifecycle management model that disaggregates IT managed apps and user-installed apps from the OS. With the solution, IT can more efficiently manage, deliver, upgrade, and maintain apps throughout their lifecycle—minimizing TCO and maximizing efficiency.

“Thanks to VMware Horizon, our students have technology that suits their needs, with **the ability to study from anywhere and via the device of their choosing.** We're already getting great feedback in our internal student surveys and expect this to carry on through to external rankings, which ultimately will help to attract more students to come here—as well as the very best academics.”

IAN ROWLEY
DESKTOP MANAGER, IT SERVICES,
UNIVERSITY OF ABERDEEN

BETTER PROTECT PERSONAL DETAILS AND RESEARCH DATA

Transform
Security

Technology-driven learning creates new opportunities, but also generates new risk. On campus and off, students, professors, and business partners want to ensure intellectual property (IP) and personally identifiable information (PII)—including birthdates, social security numbers, addresses, paystub information, and more—is protected. Although educators, students, and staff demand non-stop access and innovation, security remains a top campus IT priority. Only VMware offers a transformative approach to security—through a ubiquitous layer of software—that provides comprehensive, unified end-point management and network security technology, purpose-built for providing IT with granular control that starts in the data center and finishes at the device.

Zero-Trust Networking with Micro-Segmentation

Classic perimeter security models focus on protecting the outside. VMware NSX works from the inside out, creating a zero-trust network built around granular, workload-specific security that guards against dangerous lateral threats that breach perimeter defenses and may linger, undetected, in the data center for months. NSX makes micro-segmentation economically and operationally feasible, providing the networking and security foundation for the software-defined data center, enabling the three key functions of micro-segmentation: isolation, segmentation, and segmentation with advanced services.

Protection from Data Center to Device

VMware solutions keep data protected by ensuring it stays in the data center, not on end-point devices. Through conditional access policies, IT can enforce access decisions based on a range of decisions, including strength of authentication, network, location, and device compliance. Powerful policy controls also help IT to protect against compromised devices. Additional VMware AirWatch technology makes remote device wipe not only possible, but simple.

Comprehensive Approach to Security

As any campus that has experienced a public data breach can attest, hindsight is 20/20. Traditional, policy-based checklists of security functionality are no longer sufficient. Preventative measures are integral to a holistic cybersecurity strategy because campus data is now accessed anytime, anywhere across a wide variety of devices.

Comprehensive VMware security and compliance solutions include protecting the following:

- **Devices**—Protect against malware, viruses, and suspicious device behaviors
- **Networking**—Block malicious networks and man-in-the-middle threats
- **Applications**—Scan, analyze, and validate apps
- **Cloud**—Secure and monitor cloud services for data loss and threats

“VMware vRealize Automation and VMware NSX add real value to the business, ultimately securing data and giving us the ability to meet compliance. We are part of HIPAA, FERPA, and about eight different audit compliances. **NSX gives us the ability to more easily meet compliance in a streamlined way that’s less expensive and less manual.** What this allows us to do is double and triple in size without increasing the amount of staff so that’s a huge benefit.”

BRIAN PIETREWICZ
DIRECTOR, IT, COMPUTING PLATFORMS,
UNIVERSITY OF NEW MEXICO

TRUSTED VMWARE SOLUTIONS EARN HIGH MARKS IN HIGHER EDUCATION

For students and educators that demand greater personalization and learning resources access, anytime, anywhere, on every device, IT innovation is critical. That's why leading global academic institutions are deploying the comprehensive VMware portfolio of solutions. Across campuses worldwide, VMware solutions are helping IT staff modernize infrastructure and apps while expanding learning opportunities with cloud, creating exceptional mobile experiences, and better protecting PII and research data.

VMware virtualization technologies have saved academic institutions millions of dollars in capital expenses. With the software-defined data center, VMware is reimagining learning and the business of education by extending the paradigm of resource abstraction to all infrastructure domains, on-premises and in hybrid cloud environments, while the digital workspace improves user and customer experiences, driving the digital agenda.

VMware solutions accelerate digital transformation for academic disciplines as well as other institutional services, from financial aid and development transactions to university medical center care to campus transportation services. VMware solutions are ideal for solving academic institutions' infrastructure, cloud, customer engagement, digital, security, and compliance challenges—all while reducing IT complexity.

[Learn more](#)

www.vmware.com/solutions/industry/education.html

1. Department of Education, "Reimagining the Role of Technology in Higher Education," January 2017.
2. Pearson "Student Mobile Device Survey," June 2015.
3. Cisco, "Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–2021," February 7, 2017.
4. National Center for Education Statistics. U.S. Department of Education, <https://nces.ed.gov>.
5. R&D Magazine, "How Academic Institutions Partner with Private Industry," April 2015.
6. Life Sciences Education. David Gross, University of Massachusetts, "Increased Preclass Preparation Underlies Student Outcome Improvement in the Flipped Classroom."
7. Babson Survey Research Group, "The 2015 Survey of Online Learning," February 2016.





Learn more

www.vmware.com/solutions/industry/education.html

vmware®

VMware, Inc. 3401 Hillview Avenue Palo Alto CA 94304 USA Tel 877-486-9273 Fax 650-427-5001 www.vmware.com

Copyright © 2017 VMware, Inc. All rights reserved. This product is protected by U.S. and international copyright and intellectual property laws. VMware products are covered by one or more patents listed at <http://www.vmware.com/go/patents>. VMware is a registered trademark or trademark of VMware, Inc. in the United States and/or other jurisdictions. All other marks and names mentioned herein may be trademarks of their respective companies.

Item No: VMW-BRO-EDUCATION-HE-USLET-106
05/17