“There are 20 million students in the next decade who will begin college or return to college and they will do so online. For those students, the transformative process of moving themselves forward in education can take place using lecture capture to deliver that education.”

Dr. Karen Rhoda
Dean of Online Learning
Walsh College

(Capture + Learn) Everywhere * Scalable Platform = Echo360
Why Lecture Capture?

For hundreds of years, students have practiced lecture capture through the process of taking notes. Lecture capture has since evolved, first with audio cassettes, then television, and now through web streaming and rich media.

Today, lecture capture is defined as a category of academic technology that enables instructors to record audio, course visuals and optional video for student review in a digital format. While the term implies the recording of an actual class session, the definition includes the creation of learning objects, review sessions, tutorials and screen casts that augment classroom instruction.

The uses of lecture capture are as varied as the universities adopting the technology. Traditional college-age students appreciate the flexibility of reviewing course materials online, often due to learning differences, missed concepts or even an absence resulting from illness or sporting commitments. As the profile of a typical college student has evolved to include adult and part-time learners, lecture capture has become an important curriculum component enabling institutions to better serve the changing face of the student body through distance learning and hybrid course delivery.

Echo360® addresses the unique and specific needs of higher education with a platform designed to support lecture capture campus wide. This is the story of Echo360 lecture capture including an overview of the EchoSystem solution, benefits for students, instructors and administrators, and finally, actual success stories from some of Echo360’s 400+ client institutions around the world.
Capture Everywhere

Echo360 has created a single platform that addresses the diverse recording needs of the entire university community with options to “capture everywhere”. Whether a fixed installment in classrooms and studios or a personal capture scenario in offices and learning spaces, Echo360 has a solution that supports the academic, pedagogical and technical needs of the institution.

Venue-Based Capture

Who: Faculty, Staff, Guest Speakers
Where: Lecture Theaters, Smart Classrooms, Studios
What: Lectures, Class Content, Special Events

Flexible Capture with Venue-Based Solutions

Echo360 provides universities with two flexible options for fixed classroom installations based on cost, technology sophistication of the classroom and the type of curriculum being taught.

Capture Appliance

The capture appliance from Echo360 is the premium recording option—providing enterprise robustness through a dedicated plug-and-capture approach. Purpose-built for academic capture, the appliance has inputs for typical A/V sources in a compact design suitable for podiums and equipment racks. With software updates automatically installed, the appliance cuts the time and cost associated with maintaining PC-based recording solutions. For more on the appliance, see Chapter Five.

Podium Capture

Some universities may prefer to run EchoSystem capture software on existing classroom PCs. This option suits smaller classrooms where a video source may not be required. Students benefit with podcasts and/or a rich media experience without video, while institutions have a transparent and economical option that leverages existing technology investments.

Consider the following questions:

- **Who** is being captured?
- **Where** is the capture taking place?
- **What** is the purpose of the capture?

Purdue University

- 70 classrooms
- Plans to scale to 270 classrooms
- 100% of general-purpose classrooms
Beyond the Classroom with Personal Capture

Learning and teaching can take place anywhere. With personal capture software from Echo360, instructors can easily create and publish rich media learning objects, tutorials and other course materials to augment their in-class instruction and lecture recordings.

What Faculty See When Preparing A Capture

“Thanks to the extremely easy-to-use nature of the software...staff who have previously struggled with other packages are enthusiastically recording, editing and uploading a rapidly growing amount of material.”

Martin Hill
iLecture Systems Manager
Curtin University

With an offline capture mode, faculty can capture wherever inspiration strikes—an office, home, library, dorm or even the corner café. Personal capture software is compatible with Mac and Windows computers, and needs only a microphone to capture audio or a webcam to capture video. Easy to use, an instructor can record audio, video and the computer screen with one click. Optionally, the presentation can be customized with local editing before publishing to the desired CMS/VLE course.

As a fully integrated component of Echo360’s platform, recordings made with personal capture software are centrally managed from the same administrative interface as venue-based capture. Echo360 provides a single platform for institutions seeking a unified approach to the capture and delivery of web-based media.

Best Practices for Personal Capture:

- Equip all instructors with personal capture to continue teaching during university closures, pandemics and other emergencies.
- Record and share student projects or presentations for self-evaluation and peer review.
- Create learning modules or tutorials to review difficult concepts and homework assignments.
chapter 2
Learn Everywhere

For students who’ve grown up in an on-demand world, the 24/7 availability of their lectures is an expected part of their educational experience. Students choose the playback environment that best meets their learning style. Echo360 lectures are viewable on today’s most popular computers, netbooks and mobile devices without special plug-ins.

From their dorm rooms to the coffee shop, students learn everywhere with Echo360 rich media.

Engaging Students with Rich Media
The EchoSystem rich media player includes a full-motion replay of every course visual synchronized with the instructor’s voice for a highly engaging experience. By using Adobe® Flash technology, students on Windows, Mac and Linux platforms can replay lectures on any browser without client software downloads. The presentation index, keyword search and DVD-style controls give students the option to identify and repeat a concept for improved comprehension.

Higher education strives to meet the requirements of all students, and Echo360 responds with an accessible learning experience. Deaf and hard of hearing learners benefit from Section 508-compliant closed captions. Addressing the needs of low vision students, Echo360 includes a JAWS-compliant screen reader. And for those located in rural regions without broadband, a low-bandwidth player is packaged with every lecture.

“Students and children today have a pacifier in one hand and a mouse in the other...students are more interactive in their learning and they expect to have more access to the information not only inside the classroom, but outside the classroom.”

Earl Parks
Director of Academic Technology
Gallaudet University

Mobile Learning:
Podcasting increases the convenience and mobility of the on-demand learning experience by putting learning in the palms of students’ hands. Echo360 podcasts include a variety of media from audio to video, and are automatically inserted alongside music and movie playlists from iTunes U. Audio and visual podcasts are also accessible on computers and netbooks.

“It takes so much of the stress away.”
Verity Haring, Student
University of Western Australia
As the student appetite for online replay of their education increases, administrators face mounting pressure to provide reliable capture in more places on campus. Echo360 simplifies the capture, assembly, publishing and final delivery of rich media educational content. By automating the end-to-end process—and implementing key features like visual confidence monitoring—a campus-wide lecture capture service can be managed from a central location without increasing staff.

Automated Closed Captioning
No longer forced to choose between watching an interpreter and taking notes, deaf and hard of hearing students simply replay captioned lectures to improve comprehension. By automating the application of Section 508-compliant captions, the EchoSystem speeds turnaround and reduces manual transcription costs.

“...it a must-have technology to serve the deaf and hard of hearing student population...”
Phil Bravin
President-Emeritus of the National Captioning Institute

Rich media content created with any Echo360 capture solution can be tailored by instructional technologists and faculty with web-based editing capability.

The London School of Economics
• 31 classrooms
• 97% of students request more capture
Automated and unobtrusive. Capture with confidence with the EchoSystem.

1. Schedule
For Echo360 venue-based captures, institutions can establish semester-long schedules based on date, time, classroom and instructor. Schedules can also be driven by EchoSystem scheduling APIs. For ad-hoc events, faculty can start captures through an easy-to-use web interface or a room control system.

2. Capture
Echo360 captures audio and video sources, and existing course visuals from document cameras, Sympodiums and more. Captures start and stop automatically on either the capture appliance or podium computers. Faculty can pause and resume recordings.

3. Package
Echo360 transforms captured AAC course audio and H.264 video and VGA sources into ready-to-play rich media and podcasts. Captured media is automatically packaged based on event profiles.

4. Publish
Links to lecture recordings are automatically published to popular systems like Blackboard®, Moodle, ANGEL, iTunes U or custom portals with the EchoSystem open publishing SDK.

5. Learn
On-demand, day or night, students can playback their courses on computers and mobile devices.

6. Monitor and Report
With a modern web-based interface to track lecture capture operations across campus, Echo360 proactively alerts administrators of capture success or potential problems. Usage reports give faculty visibility into their most popular lectures while administrators gauge viewing habits and system capacity.

"The captions and subtitles in Echo360 lecture capture make it a must-have technology to serve the deaf and hard of hearing student population..."
Phil Bravin
President Emeritus of the National Captioning Institute

Rich media content created with any Echo360 capture solution can be tailored by instructional technologists and faculty with the web-based editing capability.

- 31 classrooms
- 97% of students request more capture

The London School of Economics
Lecture capture adoption patterns show that universities typically pilot the technology, expanding the service over the course of multiple semesters. Echo360 addresses the needs of institutions with modest capture needs as well as those scaling to the world's largest lecture capture implementations through a broad set of functionality, a modular design and flexible pricing and packaging.

Modular Solution Design: Echo360's best-of-breed technical design suits small and large implementations alike. The modular capture model enables the seamless addition of capture devices while the automated media processing workflow can be easily extended with additional CPU horsepower to meet capacity requirements. Echo360 uses an enterprise-grade server architecture that supports single server deployments and can be decoupled to support multi-server installations for high-volume capture and delivery environments.

Operational Scalability: Echo360 offers unparalleled operational scale by containing the resources needed to manage enterprise lecture capture. Achieved through its product design, Echo360 saves staff time with schedule-based capture, automated processing workflows, and central web-based management of administration tasks. Integrated monitoring incorporates command-and-control style confidence monitoring for capture. Pro-active workflow and service status alerts notify administrators of problems while diagnostic tools track status and activity.

Interoperability: Using EchoSystem open APIs, universities can customize their lecture capture workflow to improve operational efficiency and further reduce manual steps. Echo360 capture devices incorporate an API for integration with room control systems from AMX, Crestron and more. Using the scheduling API, data from scheduling systems can be used to automate scheduling across a large numbers of classrooms. For universities requiring custom CMS/VLE integration, Echo360 offers an open publisher framework SDK to extend the pre-defined publishing options of lectures without staff or faculty intervention.

Flexible Pricing: Echo360 offers multiple pricing options to meet the diverse needs of higher education. Institutions can choose from a collection of product packages designed to balance product functionality, deployment type, installation size and university budgetary considerations.

“We already have a content management, registration and room control systems in place. Using the APIs, we can tie the EchoSystem into what we’ve already invested time and effort in, and everything keeps working.”

Chris Bellerjeau
Director, Multimedia Services
Columbia Business School

University of Western Australia (2008)
- 65 classrooms
- 15,000 captures
- 1,000,000 student views
chapter 5
Optimizing Capture with the Purpose-Built Appliance

Designing a scalable lecture capture solution requires more than efficient backend operations and management capabilities. To scale across a university and fulfill on the vision of capturing all courses for an enriched educational experience, a capture solution must also address the cost and technology inefficiencies created at the point of capture, usually within the classroom environment.

During the infancy of capture, first-generation recording solutions required a dedicated PC to run capture software. This method—adequate for high-end classrooms or special events that are staffed at all times—is less than ideal for large deployments because of the support demands of Windows-based PCs. For universities looking for a different option or who’ve yet to invest in classroom PCs, Echo360 introduces the EchoSystem capture appliance as a viable, scalable option for venue-based capture.

Echo360 developed the capture appliance as part of the next-generation lecture capture platform. As the first non-PC device built and dedicated to the capture of course content, the appliance eliminates the in-classroom support, IT and A/V barriers to campus-wide lecture capture.

The capture appliance’s compact design, plug-and-play installation, and Ethernet and VGA switching capabilities remove the barriers associated with scaling lecture capture at the facilities level. As an integrated component of the overall Echo360 platform, technology staff can monitor capture status with a web-based interface and remotely update capture software for all appliances across the university.

“...The EchoSystem architecture provided us with a viable alternative to adding computers to the classroom. The capture appliance helps us manage the limited and valuable space in our classrooms.”

Anand Padmanabhan
CIO, NYU Stern School

The capture appliance reliably captures every lecture moment in a secure environment. Built on a hardened, embedded Linux operating system, the appliance provides a reliable and secure capture environment without requiring IT staff intervention.

The capture appliance is built to accept advanced video, audio and VGA sources. It supports NTSC and PAL video sources from composite or S-Video feeds using RCA or Mini DIN connectors, while line-in audio comes from stereo RCA or 1/4” stereo phono connectors. Motion VGA capture is supported from display sources with 4:3, 5:4, 16:10 and 16:9 aspect ratios at resolutions up to 1920x1200. The appliance fits in equipment racks with a small form factor. Dimensions are 298mm wide by 223mm deep by 43mm tall.

For complete technical specifications, please visit www.echo360.com
Supporting the Capture Experience

Providing an exceptional customer experience is job one for the Echo360 technical services team. Echo360 partners with customers to help each institution maximize its investment in a campus-wide lecture capture solution. Services are designed to fit lockstep with a client’s experience with Echo360, commencing with presales consultation, continuing through initial deployment and sustaining customers as lecture capture becomes a mission-critical teaching and learning technology.

Deployment Planning
From solution design and network capacity planning to location readiness, Echo360 works with clients to document requirements and tailor a solution that meets each institution’s unique needs. Echo360 solutions and deployment engineers work in tandem to provide consultancy and project management throughout the planning and installation phases. The engineer organizes each step of the deployment process to ensure a successful installation and transition to technical support.

Installation Services
Using the experience and knowledge gained at more than 400 universities around the world, an Echo360 engineer will lead the onsite deployment process to ensure proper configuration, installation and client acceptance. Installation times range from as little as a few hours to many days depending on the complexity of deployment and the number of capture devices.

Training
With curriculum designed for faculty and technology staff, Echo360 trains customers to capture, manage and operate the EchoSystem after the Echo360 team leaves the campus. Technical instruction focuses on topics related to successful enterprise lecture capture operations, including scheduling, capacity planning, capture management, monitoring and back-up practices.

Technical Support
Crucial to every enterprise technology deployment is post-installation support. Echo360 support engineers provide phone and email support with escalation procedures to software engineering and quality assurance teams. There is no limit to the number or type of problems that can be reported. Community-based support and the Echo360 knowledge base are available at www.LectureCapture.com.

Onsite Seminars
Once a system is deployed, educating faculty and staff on the availability of lecture capture and EchoSystem usage helps ensure long-term success. Echo360 will optionally provide additional instruction for faculty and technologists with onsite educational sessions. Session topics, which are customizable, include product capabilities, best practices, lecture capture case studies and discussions with Echo360 experts.

“Echo360 was there for us.”

Dr. Karen Rhoda
Dean, Online Learning
Walsh College
chapter 7
University Case Studies

Colleges and universities have selected Echo360 for its heritage, teaching and learning focus, technology platform and vision for long-term university success. Here are a few stories that explain why:

Echo360 focuses on higher education

• Echo360’s university heritage provides the foundation for understanding the unique needs of educators and students.
• Experience in thousands of classrooms at 400+ colleges and universities in 24 countries helps Echo360 make informed product choices balancing the considerations of pedagogy and technology.

Echo360 is easy to use and accessible for all students

• Columbia University School of Business students replay lectures on personal computers using only a browser and the ubiquitous Flash codec—no plug-ins required.
• Gallaudet University uses Echo360’s closed captioning integration to make lecture capture accessible to the school’s 1,000+ deaf and hard of hearing students.
• 99.5% of students surveyed at University of Western Australia rated Echo360 as an essential or required learning resource.

Echo360 solutions fit the subject matter, curriculum type and method of course delivery

• SUNY Stony Brook delivers hybrid medical courses by using recorded lectures as homework while reserving face-to-face class time for valuable group work, discussions and labs.
• Faculty at Clemson University’s department of engineering deliver the world’s only masters in project management for supply chain. Adult professional students “attend” classes from Saudi Arabia, the US and China.
• Nursing students at Central Wyoming Community College experienced a 6.5% increase in exam scores with Echo360 podcasting.
Echo360’s mix-and-match solutions provide options for venue-based capture and beyond

- Curtin University pairs venue-based capture in 70 classrooms with personal recording capability for instructors spread over multiple campuses in Australia, Malaysia and Singapore. The result is 40,000 lecture recordings used for everything from student revision to disaster recovery.
- Purdue University standardized campus-wide lecture capture in its general-purpose classrooms by blending Echo360 venue-based software and hardware solutions to create rich media and podcasts. Instructors can walk into any classroom on campus knowing their course will be captured without having to learn a new technology.

Echo360 provides scalable lecture capture with the industry’s only purpose-built appliance

- NYU Stern uses 42 capture appliances as an alternative to PCs in their space-constrained classrooms, improving operational efficiencies while reducing security concerns.
- Columbia University Business School uses the capture appliance to deliver a high-quality, video-enhanced education at a lower cost than previous manual capture methods.
- Duke University no longer expends valuable staff resources managing Windows images for their PC-based capture devices.

Echo360 uses automation to support the scaling of campus-wide lecture capture

- The London School of Economics quickly scaled lecture recording to 31 classrooms daily with long-term plans to outfit all teaching spaces seating 24 or more students. Survey results show that of LSE students using lecture capture 97% wanted more.
- George Washington University facilitated widespread adoption of lecture capture by becoming the first university to automate classroom podcasting to iTunes U in 2007.

Echo360 gives universities the flexibility to customize and extend lecture capture with open APIs

- San Francisco State University is enhancing Echo360’s Moodle integration with special focus on providing an accessible means to distribute lectures. When completed, the integration will be shared with the global Moodle/Echo360 communities.
- The George Washington University and Purdue University are using the EchoSystem scheduling API to create a web form for instructors to sign up for semester-long capture. The form will notify the EchoSystem scheduler and recordings will happen without technology staff intervention.
- Swinburne University developed an AMX module that integrates with the EchoSystem device API to provide pause/resume capture controls to lecturers on the in-room control systems.

“Using this technology levels the playing field for students on individual education plans by letting them learn and take tests at their own pace. It is important to integrate our special education students; this technology moves toward inclusion of all students.”

Ken Dunkelberger
Director of Technology
Tamaqua Area School District

1 IT Services Annual Report 2008; The London School of Economics and Political Science
“By sponsoring scholarship in the area of lecture capture, Echo360 is taking a clear leadership role in promoting learning technologies that are not just new, but that are also proven. The knowledge from these studies, and more importantly, the application of this thoughtful, research-based approach, will benefit teachers and students everywhere.”

Dr. Jared Danielson, Director, Office of Curricular & Student Assessment, Iowa State University, College of Veterinary Medicine

chapter 8
Join the Echo360 Community

Echo360’s commitment to education extends beyond its products. To better support the mission of educators to research and teach, Echo360 has launched a variety of community efforts that connect customers worldwide. Through these programs, Echo360 customers can network, learn and share the best ideas about lecture capture without leaving their campus.

Lecturecapture.com

Launched in 2009, Lecturecapture.com is an online community designed to facilitate the sharing of best practices and ideas about lecture capture and the role of technology in academia. In the open spirit of higher education, everyone interested in the productive exchange of ideas surrounding lecture capture and its impact on learning and pedagogy is encouraged to join.

Members can browse the more than 200 related resources and studies or join the discussion forums on a variety of topics. Echo360 clients can connect with other users worldwide, and search for technical information to get the most from the EchoSystem.

Annual Research Grants Program

Echo360 is sponsoring the first research program of its kind to accelerate the global body of knowledge surrounding lecture capture technology and its impact on academia.

The recipients of the inaugural 2009-2010 grants are:

- City University of Hong Kong: Exploring Echo360 Continuance in a Trilingual Environment
- Coventry University: Learning Designs for Captured Lectures
- Iowa State University College of Veterinary Science: The Use of Lecture Capture in Light of Teaching Approach and Content Type—An Institution-Wide Study
- Murdoch University, Macquarie University and the University of Newcastle: An Investigation of Study Behaviours in Learning Environments Supported by Echo360 Lecture Recording Tools

Join today at LectureCapture.com