

San José State University Pioneers New Educational Methods Using Innovative Collaboration Technologies for the Classroom and Beyond

From virtual lectures and office hours to flipped classrooms and asynchronous learning, San José State University (SJSU) is seeing early success in deploying collaboration technologies to create unbounded learning.

HIGHLIGHTS
<p>CUSTOMER PROFILE</p> <ul style="list-style-type: none"> • Customer: San José State University (SJSU) • Region: North America • Industry: Higher Education • Faculty: Approximately 2000 • Students: Approximately 30,000
<p>BUSINESS PRIORITIES</p> <ul style="list-style-type: none"> • Embrace new educational methods that take advantage of the latest technologies to achieve unbounded learning for faculty and students • Democratize higher education and open up the institution to a broader community, including those who may be constrained by work schedules or long commutes • Test and evaluate innovative pedagogical approaches, from virtual and flipped classrooms to distance learning, asynchronous learning, and hybrid combinations of these strategies • Share collaboration best practices with the California State University (CSU) system, accelerating adoption of new technology-driven educational methods across the state • Significantly upgrade SJSU's IT infrastructure to support new collaboration initiatives across the campus
<p>CISCO SOLUTION</p> <ul style="list-style-type: none"> • Cisco WebEx® • Cisco Jabber™ • Cisco Show and Share® • Cisco TelePresence®
<p>COLLABORATION IMPACT</p> <ul style="list-style-type: none"> • Added flexibility to education programs by enabling students and professors to attend class from home or while off campus • Enabled efficient coordination of international programs and joint teaching efforts with partner institutions • Increased productivity with online, asynchronous learning tools that allow students to replay content at their convenience and fit coursework into busy schedules • Enhanced administrative efficiency with virtual alumni meetings, candidate screenings, and academic open houses

The Challenge

San José State University (SJSU) holds the distinction of being the oldest public institution of higher education on the United States (U.S.) West Coast and the founding campus of the California State University (CSU) system. The university serves more than 30,000 students, including over 4,700 graduate students - the largest graduate student enrollment of any campus in the CSU system - and offers more than 134 bachelor's and master's degrees with 110 concentrations, and three joint doctoral degrees. Ethnically diverse, SJSU has the highest foreign student enrollment of all master's institutions in the U.S.



SJSU's location in the heart of Silicon Valley gives the institution an edge in the technology marketplace, and it routinely supplies high-technology firms in the area with more engineering, computer science, and business graduates than any other college or university. It's not surprising, then, to see SJSU embrace educational methods that exploit the latest technology to dramatically enhance the university experience.

These technologies include everything from online collaboration platforms to social media, and underpin a range of innovative, new pedagogical approaches, from virtual and “flipped” classrooms to distance learning, asynchronous learning, and hybrid combinations of these strategies.

As noted by President Mohammad Qayoumi, “San José State's online initiatives are about far more than a single subject, technique, or campus. Our work is about trying many new approaches, identifying what works, and pushing forward a national conversation on effective ways to infuse the opportunities offered by technology into the way we teach and learn.”



Democratizing Higher Education

SJSU seeks to use tech-powered pedagogies to help democratize higher education by opening up the institution to a broader community. That includes many people who can't afford the rising costs of attending college, who may be constrained by work schedules or long commutes, or who face other challenges that can slow or halt their academic progress. “We want to make it clear to the world that we are committed to helping students of all walks of life make it through to graduation and succeed at San José State,” said Ellen Junn, Provost and Chief Academic Officer at SJSU.

Junn and other SJSU leaders reasoned that by deploying distance-bridging and schedule-friendly technologies, the university could keep more students on track and reduce the time to graduation from today's average of six years. A faster transit through the university saves money for the student, and also makes room for more students to attend the university.

“Our collaboration with San José State University is a strong example of how well-designed, blended learning can engage students and substantially improve learning outcomes.”

— Anant Agarwal, President, EdX

Taking the Initiative

Seizing the opportunity, SJSU's leaders took an aggressive approach in adopting new technology-driven methods in the classroom and across the university. The new strategy was written into SJSU's academic plan, which calls for recognizing faculty who are engaged in “effective pedagogical innovations” and helping train professors to use “widely available online educational resources that promote student learning and engagement.” The plan also directs the university to “enhance, support, and provide technology to facilitate virtual classrooms.”

To help pilot the technology and incubate new online learning methods, SJSU forged partnerships with a handful of leading technology companies, including Cisco and Google, and with online course-content providers including EdX and Udacity. “At SJSU, we seek to become recognized leaders in developing innovative and effective curricula, reinventing and supporting faculty work, deepening student engagement with academic and professional learning, and expanding our international and global connections by utilizing effective new technologies to meet academic goals,” said Junn.

Removing Barriers

SJSU accelerated its rollout of new learning models by centralizing the technology decision-making process, ensuring cost-efficient, campus-wide rollout of several enabling collaboration technologies, such as Cisco® WebEx and Google Docs. The university also won support from the top of SJSU’s academic ranks, as well as its two key technology support teams: Information Technology Services (ITS) and Academic Technology Services (ATS). “Academic leadership is very important because a university is an institution like no other,” said Junn. “Leadership must be able to articulate the value of technology in education and coordinate with the support teams to help guide our faculty.”

To succeed with the initiative, SJSU needed to overcome a few technical and institutional barriers. SJSU’s professors, for example - like academics everywhere - wanted solutions that were relatively easy to implement and work flawlessly. Most teachers are not IT specialists and have little time for evaluating or mastering new classroom technologies. The university addressed the concern by offering professors financial incentives and workload relief to help them explore new technologies and teaching models, and then decide what might work best for them.

The university also bolstered its technical support infrastructure and services, and pursued a systematic approach to rolling out new solutions - for example, by starting with professors who expressed early interest in trying out collaboration and social media initiatives. For early adopters, SJSU’s support teams offered special workshops with instructional designers, walk-in labs for faculty, and 24-hour daily help desk support. All of these efforts come on top of a campus-wide technology upgrade project. “SJSU is undergoing a significant upgrade to our IT infrastructure across the campus including network, wireless, and data center upgrades,” explained John Briar, Senior Managing Director of SJSU’s Information Technology Services. “These improvements will provide greater BYOD [bring your own device] flexibility to our students, faculty, and staff, and provide a platform for future technologies in the classroom.”

“San José State University is implementing a new-generation IT infrastructure to support the evolving needs of our students, faculty, and staff. Mobile devices, the cloud, and ubiquitous access to educational resources are some of the drivers.”

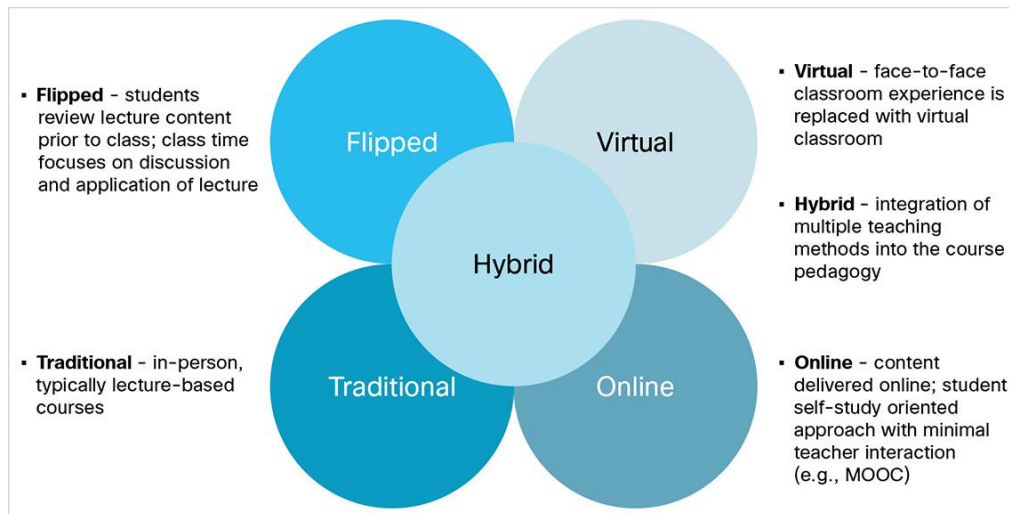
— Terry Vahey, Associate Vice President and CIO of SJSU’s Information Technology Services (ITS) department

Testing A Spectrum of Collaboration-Based Teaching Methods

Rather than ruling out certain approaches at the beginning, SJSU’s initiative made a point of exploring the widest possible variety of technology-enabled teaching methods, with the understanding that there would be necessary refinements and pivots made throughout the early trials of these methods. Professors from a mix of disciplines piloted new pedagogical techniques with the help of online collaboration tools and technologies provided by Cisco, Google, Skype, and others - along with online content from Udacity and EdX. Many of these tools and technologies were integrated with SJSU’s learning management systems, including Desire2Learn, and Canvas.

As shown in Figure 1, the new techniques being tested included flipped classrooms; virtual classrooms that feature live, interactive video conferences with remote participants; online classes that feature schedule-friendly, asynchronous learning methods; and hybrid forms of all these methods that mixed virtual and online methods with traditional in-person classroom techniques.

Figure 1. SJSU Alternative Teaching Methods



Results: Early Adopters Proving the Value of Collaboration Technology

SJSU's collaboration technology initiative generated early successes that are laying the groundwork for full-scale adoption. This section reviews the results of more than a dozen pilot programs at SJSU that are taking full advantage of collaboration tools and solutions in a range of teaching, counseling, and administrative settings.



Virtual-Hybrid Models: Extending the Classroom to Hard-to-Reach People and Places

SJSU has achieved significant success with hybrid teaching methods that combine virtual classroom technologies with traditional in-person teaching techniques. This virtual-hybrid approach augments and adds flexibility to educational programs by enabling students (and professors) to attend class from home or while traveling - typically using a variety of video and web conferencing solutions such as Cisco WebEx. As a result, professors can extend the reach of the program and more easily coordinate joint-teaching efforts with partner universities, hospitals, and other institutions. Examples of SJSU's use of virtual-hybrid teaching methods follow.

- **College of Engineering Adds Flexibility to Writing Course and Boosts Attendance with WebEx-Powered Virtual Classes**

Engineering students are among the most tech-savvy around, so it made sense for the engineering school's writing program to try out new virtual classroom methods. (These students were already accustomed to using SJSU's Canvas learning management system to access course materials and assignments.) The professor reasoned that adding virtual classes over Cisco WebEx technology would improve attendance by giving students an option when they can't be there in person, or when the professor herself was traveling. Today, with the writing class augmented by WebEx with desktop sharing, attendance has surged: the recent virtual course racked up perfect attendance compared to traditional, in-person classes that only attracted between 58 and 82 percent of total enrollment. Next, the professor wants to add WebEx Social to enhance asynchronous communications among students, and plans to use big-screen Cisco TelePresence sessions for larger classes.

“Including technology as part of the classroom is extremely important to me as an engineering student. Just being here in the valley and looking to begin a career in technology, having the familiarity and skills using these tools is required.”

— Junior Student at SJSU

- **College of Science Extends Reach of Genetics Program**

SJSU's renowned genetics program attracts students from everywhere, including a significant contingent from Southern California. But serving students over long distances was a challenge for SJSU and put a ceiling on enrollment. That changed when SJSU rolled out a Virtual-Hybrid classroom model that enables students from hundreds of miles away to join classes over WebEx technology. Some traditional classes are still part of this hybrid program, with a portion of students attending hands-on clinical sessions hosted in Southern California. Course administrators now hope to use collaboration tools to conduct remote tutoring and expanded office hours, and introduce high-quality, immersive video in the classroom using Cisco TelePresence and Jabber.

- **College of Business Goes Virtual to Add Momentum to Popular Course**

One of SJSU's most popular business classes is taught by a professor living outside the San Francisco Bay Area, so it's a stretch for him to make it to campus every time. (It's hard for students as well, because many are spread out geographically.) WebEx has added flexibility to this class - and keeps the curriculum on track - by mixing traditional and virtual sessions throughout the semester. The first class is typically held in-person, as is the concluding session: a popular inter-collegiate competition in Southern California. The hybrid model is yielding significant savings, including reduced travel costs and time for the professor - \$1250 in gas alone and countless hours of driving time. Going forward, the professor hopes to enhance asynchronous communications using WebEx Social and deploy Google Docs and Google Drive to simplify document sharing. Cisco TelePresence-based collaboration solutions are also being evaluated to enhance the learning experience with high-quality video.

- **WebEx Helps Mexico-Bound Graduate Students Stay on Course**

Students in SJSU's Master of Public Health (MPH) program have the choice of two educational formats: a traditional on-campus classroom model and a distance-learning alternative that involves an extended visit to a Native American community (Pueblo) in Mexico. The distance program faces tough logistical and cost challenges, so SJSU has been introducing collaboration technologies, including WebEx, to streamline and

enhance the overall experience and keep students on a rigorous 24-month timeline. The program kicks off with six weeks of WebEx-driven virtual classes that students can replay anytime, combined with several in-person classes that take advantage of “flipped classroom” techniques in which students - already prepped with online videos and articles - come to class ready to talk, not just listen. While in Mexico, students stay on track with the help of WebEx virtual classes that reduce the need for expensive return trips to the U.S. campus. SJSU is now looking at integrating Cisco Show and Share, TelePresence, and Jabber to support a wider range of virtual interactions that can be easily shared with students and international partners.

- **Collaboration Solutions Help Prepare Next Generation of Technology-Enabled Educators**

With school environments evolving in response to technology advances, SJSU’s College of Education (CoE) launched an initiative called the 21st-century classroom that is helping the next generation of teachers adapt to the future. The initiative, which introduced technology-driven teaching methods, faced some resistance from faculty members. Many were comfortable with traditional methods and others wanted empirical proof that new methods really work. Attitudes changed after the college renovated the classrooms with the latest media gear - including SmartBoard projectors, mobile furniture, high-speed wireless networks, and HD video conferencing booths - and rolled out applications like Skype, WebEx, and Canvas. Teachers and students quickly embraced the flexible new environments along with new techniques like flipped teaching. The college is now looking at launching a co-teaching program in which students team with area teachers in real classrooms and experiment with video collaboration as both tools to enhance the delivery of a lesson and as an assessment tool of the student-teacher’s performance in the classroom. The program should benefit SJSU students and area schools alike. The college is also measuring the impact of its collaboration-powered initiatives through a separate research project.

“San José State University is uniquely positioned to be a pioneering institution in the use of academic technology because we are the only large, public university located in the heart of Silicon Valley. It has been incredibly gratifying to reach out to the industry leaders in our backyard, and receive such a positive response in terms of partnering with our faculty to develop and use technology to enrich and deepen our students’ learning and skills in the digital world.”

— Provost Junn

- **Hybrid Approach Allows SJSU and Fresno State to Jointly Deliver Nursing Doctorate Program**

By pooling teaching resources and student bases - and connecting the two campuses through distance-spanning collaboration technologies - SJSU and Fresno State found that they could successfully launch a doctorate of nursing program and create a unique regional asset for the California State University system. A hybrid combination of in-person and online classes underpins the course today, supported by joint faculty strategy meetings using WebEx, Jabber, and TelePresence. The platform helps lighten the inter-campus travel load for faculty members and connects students across the state through virtual classes. Program leaders are hoping to enhance the program by adding HD-powered TelePresence to teach larger classes and capture more lectures with Show and Share, and distribute them to students over the existing LMS platform.

Online-Hybrid Models Blend Synchronous and Asynchronous Tools to Enhance Learning

While virtual classes deliver classroom experiences in real time over the Internet, online classes (as defined here) are previously recorded so that lectures and other content can be delivered asynchronously, allowing students to replay content at their convenience and fit coursework into busy schedules. At SJSU, professors mix online classes and content with traditional in-person lectures, creating an “online-hybrid” approach that is seeing remarkable success. Professors are also integrating virtual techniques to add even more flexibility to their pedagogical toolkit.

- **Library Science Program Draws 3000 Students with Asynchronous Learning Methods**

Master’s programs in library science are traditionally a highly specialized pursuit that attracts a unique group of students, including a large contingent of working professionals with job and family constraints as well as long-distance commuters. Because of this, program designers at SJSU knew that integrating schedule- and distance-friendly asynchronous learning methods would be essential to making the program work. Today SJSU’s program uses Desire2Learn online platform to supply lesson content, quizzes, and tests whenever students find the time to access the learning management system. The program also uses Blackboard Collaborate - a WebEx-like collaboration tool - to host open houses and office hours outside of regular business hours. Students are attracted to the convenience of the platform, which has scaled easily to absorb the program’s current roster of 3000 students, increasing revenues in the process. Program designers are looking at adding a synchronous learning component to the course, possibly over live TelePresence and Jabber sessions, and to provide revenue-enhancing online continuing education for graduates over HD video platforms and Jabber.

“Our graduates go on to become top hires for many of the technology industries here in Silicon Valley,” Junn said. “So, it’s no surprise that San José State and our technology partners want to invest more in our students by working closely with our faculty to become cutting edge adopters and forerunners in the use of academic technology to enhance student learning.”

Flipped Classrooms: Collaboration-Powered Virtual Lectures Accelerate Learning

Flipped teaching methods are gaining traction in higher education as an alternative to conventional lecture-based classroom techniques. SJSU specifically designed its collaboration initiative to support flipped classroom methods by facilitating production and online distribution of video lectures and other content. In this way, students come to class ready to engage in productive discussions instead of passive note taking. The result: better content comprehension, improved academic performance, and deeper student involvement in the classroom.

- **Flipped Circuits Course Heightens Academic Performance**

Introduction to Circuits Analysis, a key introductory course for engineering students, can be a daunting assignment for new students at SJSU’s College of Engineering. To improve student comprehension and class performance, the college is innovating with online courses and flipped classrooms, the latter delivered in partnership with content provider EdX. To test the new approach, professors split the circuits course, delivering the first section with conventional in-class lectures. The following two sections use flipped techniques that ask students to watch online educational videos from EdX and complete a quiz before class. They then swap lectures for lively discussions during class time. The results were convincing: pass rates for the crucial circuits class surged from 51 percent to 91 percent.

“Flipping” a Classroom

Wikipedia defines flip teaching (or flipped classroom) as a “form of blended learning which encompasses any use of technology to leverage the learning in a classroom, so a teacher can spend more time interacting with students instead of lecturing. This is most commonly being done using teacher-created videos that students view outside of class time. It is also known as backwards classroom, reverse instruction, flipping the classroom, and reverse teaching.”

Connecting to Experts Virtually

The same video and collaboration technologies that professors use to hold virtual classes are now being deployed by SJSU to bring experts and alumni located miles away into direct conversations with students over high-definition displays. The solutions are yielding a host of benefits, from reining in travel costs to inspiring students with exceptional access to leading scholars and subject matter experts.

- **Collaboration Platform Links Professors on Two Continents**

International programs are a big part of SJSU’s academic heritage, featuring programs that send professors to Afghanistan to share journalism practices, and to Vietnam to build social works programs at six local universities. With the cost of global travel rising, the program is looking at using collaboration-at-a-distance technologies, including WebEx and TelePresence, to keep program expenses under control. Replacing a portion of the travel with virtual visits will help professors on both continents stay connected in between in-person trips and keep joint projects on track. Professors’ productivity could actually increase because much of the time spent en route is wasted. Recording and sharing lectures between the teams using TelePresence and Show and Share is also being contemplated.

“At SJSU, we seek to become recognized leaders in developing innovative and effective curricula, reinventing and supporting faculty work, deepening student engagement with academic and professional learning and expanding our international and global connections by utilizing effective new technologies to meet academic goals,” Provost Junn said. “It’s a very exciting time to be at San José State - we are a community of faculty, students, and staff who are on the move.”

- **School of Journalism Alumni Share Life Lessons at a Distance**

In the field of journalism, some of the best lessons you learn come from seasoned reporters and media professionals - and SJSU counts a number of well-known journalists among its alumni. However, many of these professionals have moved away or travel frequently, making it hard for them to share their experiences in person at SJSU. But after equipping its classrooms with TelePresence video stations, the journalism school plans to start hosting virtual guest appearances from experienced alumni, enabling them to engage in direct conversations with current journalism students.

These virtual visits can help inspire budding journalists and serve as an effective recruiting tool. The school also hopes to produce video profiles of its alumni (using TelePresence and Show and Share) to promote the program.

- **College of Business Connects Virtually to Experts and Partners**

In the past, students at SJSU's College of Business and College of Applied Sciences and Arts got almost all their lessons through books and lectures. That changed with the introduction of a high-definition video conferencing platform, including Cisco TelePresence. The platform makes it possible for business experts from around the world to spontaneously join classes virtually and engage in real-time discussions with students. To date, guest experts have included a prominent White House staffer and executives at top technology firms. Faculty, too, are using the platform to strengthen partnerships with companies (including IBM), to efficiently complete joint projects, and to conduct staff meetings. Virtual classes are now being piloted by one professor that hosts his classes virtually when he's traveling abroad, allowing the class to keep a consistent cadence despite his travel schedule. Finally, the College of Business has switched to online open house events instead of in-person, a move that helped double attendance by eliminating travel and schedule conflicts. Following these successes, the school is looking at launching an all-virtual business class for more than two dozen students.

“Usability and maintainability are key aspects of the technologies being adopted by SJSU,” AVP and CIO Vahey said. “Mobile device access to cloud- based data and services are examples of this.”

- **College of Social Sciences Uses Real-time Video to Support Collaborative Coursework with Universities in Spain and Japan.**

Comprising nearly a quarter of SJSU's total enrollment, the College of Social Sciences has embraced collaboration technology to enhance the educational experience for its students and faculty. The College's Psychology Department, for example, started employing video collaboration six years ago in connection with a master's program in industrial and organizational psychology. One part of the program featured a series of projects in which students at SJSU worked in tandem with European students based at the University of Valencia in Spain. To keep the joint projects on track and share perspectives, the students frequently held virtual, face-to-face working sessions over Skype. “Student feedback was incredibly positive,” said Dr. Sheila Bienenfeld, Dean of the SJSU College of Social Sciences. “It gave them a realistic sense of what they will encounter when they enter our increasingly globalized economy.” And by jump-starting the acculturation process, the interactive video sessions prepped SJSU students for their program-ending, three-week visit to Spain.

More recently, the college brought together SJSU professors in sociology, African American studies, and Japanese language with like-minded professors at a Japanese university to create courses on the global youth culture. Professors used Skype video to compare ideas and to create syllabi for their respective courses in Japan and the U.S. Later, when classes were in session, students on both sides of the Pacific shared insights over a big-screen Skype video connection. Going forward, Dr. Bienenfeld sees the college deploying similar tools locally to “vastly expand the pool of people” it can integrate into the educational process while also conserving resources by cutting excessive travel.

Boosting Administrative Productivity and Effectiveness

SJSU is discovering that collaboration technology can be a useful tool outside of academic settings as well. As the following cases show, capabilities like web-based video conferencing can be harnessed by administrators and alumni to streamline alumni relations, improve hiring processes, and boost attendance at open house events.

- **Virtual Open House Exposes More Candidates to Doctorate Counseling Program**

Every year, SJSU offers doctoral psychology candidates the chance to participate in a one-year internship at the university's counseling center. The internship is highly competitive, with the center choosing only four students out of about 100 applicants. In line with its social-justice principles, the center wants to ensure that every eligible doctoral student can learn about the internship - even if they can't afford to make the trip to attend the program's annual open house. The solution: host a virtual open house over WebEx to reach out to the widest possible number of candidates. The strategy worked, with the most recent open house attracting more than half of the 30 invitees virtually over WebEx. Organizers are now looking at enhancing the video broadcasts using TelePresence and Jabber, and recording the event for later viewing through Show and Share.

“Collaboration, integration, mobility, and security are themes that provide the framework for our IT product and service decision making.”

— Vahey

- **Alumni Association Boost Productivity on Collaboration Platform**

Tasked with connecting SJSU graduates to their alma mater and each other, the SJSU Alumni Association is guided by a board of directors whose members are scattered throughout the San Francisco Bay Area and beyond. Formal quarterly meetings in San José are doable for most board members, but when committees need to meet frequently, logistics can get in the way. Distance-bridging collaboration solutions, including WebEx and asynchronous tools, have eased the burden, allowing board members to keep committee work on track and boosting attendance at meetings and live events. The association is looking at using TelePresence to record key events, such as the Professional Etiquette Workshop, and posting the videos to the web with Show and Share.

- **Virtual Face-to-Face Interviews Enhance the Hiring Process**

SJSU's hiring process used to be pretty traditional: Talk to a lot of candidates over the phone and choose a small group of finalists to interview in person. The process worked well enough; but phone interviews can be misleading because they lack the social and visual cues that can help to properly evaluate candidates. To do a better job, several SJSU departments are now introducing virtual interviews in which candidates join face-to-face, Jabber-powered interviews. Administrators say the extra visual input contributes to better vetting decisions and ultimately reduces the time and cost of filling positions.

Looking Ahead

SJSU's investment in technology-enabled collaboration solutions came at the right time for the Silicon Valley-based institution. With competition for students heating up, SJSU's willingness to embrace online learning and collaboration will inspire students and faculty alike and advance SJSU's reputation as a technology innovator. As these initial deployments gain momentum, the university will likely see a broadening adoption of online and flipped learning methods, and their creative expansions into more classrooms as well as non-academic environments.

To share what it has learned with the rest of the California State University system, SJSU plans to establish a Center of Excellence in Adaptive and Blended Learning. The center initially will serve 11 CSU campuses but is expected to grow to serve the entire 23-campus system, encompassing 22,000 faculty and more than 400,000 students.

SJSU President Mohammad Qayoumi says that the university's vision for collaboration technology has focused on extending successful new strategies into as many realms as possible. "The university sits in a position of real opportunity given the double incentive of recent technological advances, coupled with the decline in state support for public education," says Qayoumi. "Never before in the history of higher education has technology provided such important challenges and opportunities. We must reinvent teaching, learning, and educational delivery systems."

Voice of the Students

Students interviewed said they were excited about the enhanced engagement that collaboration solutions are bringing to their SJSU education. The following observations are based on interviews with four SJSU students: a junior in computer engineering; a sophomore that experienced the flipped/hybrid circuits class; a sophomore in the business college; and a junior in the school of journalism and mass communications.

Common benefits and advantages articulated from the students included:

- Flexibility to take classes that wouldn't have fit into a traditional, in-person schedule
- Better study and preparation opportunities due to the ability to review materials whenever and wherever they want
- Reduced barriers to asking questions during class
- Better preparation for careers in Silicon Valley
- Greater accountability to complete class work

Common concerns articulated from the students included:

- Less opportunities to develop interpersonal and other soft skills if classes get pushed online too much
- Lessened opportunities to establish and develop personal relationships with professors and other students

For More Information

Learn more about the Cisco technologies discussed in this case study.

- Cisco WebEx - <http://www.webex.com/>
- Cisco TelePresence - <http://www.cisco.com/en/US/products/ps10352/index.html>
- Cisco Jabber - <http://www.cisco.com/web/products/voice/jabber.html>
- Cisco Show and Share - <http://www.cisco.com/en/US/products/ps6682/index.html>

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