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東京理科大学
Tokyo University of Science

CASE STUDY - EDUCATION
THE GRADUATE SCHOOL OF TOKYO UNIVERSITY OF SCIENCE (MOT)



FOSTERING HUMAN CONNECTIONS IN AN AGE OF TECHNOLOGICAL INNOVATION

The Tokyo University of Science, located in Kagurazaka, Tokyo, is one of Japan's leading science and technology universities. The Department of Management of Technology (MOT) is the graduate-focused program within the Graduate School of Management. Working closely with students, MOT fosters the next generation of advanced professionals to integrate science, technology, and management principles in response to the rapid changes in society and business today.

As a university committed to diversity, MOT attracts students from a variety of backgrounds and experiences, many holding positions at leading companies in Japan. Also among the students are retired individuals who continue to deepen their knowledge while sharing their own professional experience.

Since lectures are held mainly in the evenings and on Saturdays, students can travel to MOT from outside the central Tokyo area. MOT is a gathering place that welcomes all to learn from its distinguished professors and grow through varied discussions.

In addition to expanding one's knowledge, the intellectual environment and exposure to differing values creates a unique learning environment — reinforcing the importance of clear communication for both MOT and students.

HYBRID APPROACH NURTURES UNITY AND ENTHUSIASM

In response to pandemic restrictions on teaching in person, MOT explored ways of connecting students and instructors virtually and quickly made classes available using Zoom, ushering in MOT's hybrid classroom approach.

For the fall semester, MOT introduced a flexible learning environment where both in-person and online classes were held at the same time.

Professor Hideki Wakabayashi, director of MOT, recalled, "Initially, we started classes using the cameras with laptop microphones, but the sound clarity for the far end was not good enough. Through trial and error — such as installing multiple desktop microphones where we thought more would make the audio better — we realized we needed a solution that would provide clear, intelligible audio while also capturing the movement of the professors and show the whiteboards clearly."

One of the most challenging aspects to the hybrid classroom approach was bringing the excitement and energy students experienced in the classroom to everyone attending classes online. It was clear the university needed an audiovisual solution that captured and conveyed the lively discussions, while nurturing and motivating remote students to learn and participate as well.



BRINGING TOGETHER THE MOST ADVANCED TECHNOLOGIES IN AUDIO AND VIDEO

Sony Marketing Corporation — a Bose Professional partner dealer and one of Japan’s leading technology companies — responded to MOT’s needs. Sony installed its latest AI technology camera, which enabled automatic tracking of the professor and clear video delivery of the whiteboards. Sony ceiling microphones provided the necessary audio quality for both in-classroom speech reinforcement and online distribution, while providing a more hygienic solution than handheld mics.

In combination with the Bose Professional Panaray MSA12X steerable array loudspeakers that elevate speech intelligibility, the solution provides natural amplification with minimal feedback throughout the fan-shaped, theater classroom. At the core of the system is the ControlSpace EX-1280C conferencing sound processor, which distributes clear audio to online students via a connected PC, creating the sense of a unified classroom. The hardware collaboration between Bose Professional and Sony, and the on-site acoustic room tuning by engineers from both companies exceeded MOT’s requirements — the hybrid classroom was a complete success.

For the smaller room used primarily for group discussions and the mid-sized classroom where students learn about stock price movements, the team installed the Videobar VB1 all-in-one USB conferencing device to provide an intuitive solution that provided both Bose Professional-quality audio and ultra-HD clarity for online communication.

“The energy of the classroom is now shared with those who participate via Zoom,” Wakabayashi stated. “Our desire to have transparent technology created a sense of unity by eliminating the barrier between online and in-classroom learning.”

REALIZING THE IDEAL EDUCATIONAL ENVIRONMENT FOR THE NEXT GENERATION

Thanks to the 4K ultra-HD camera, microphone and loudspeaker, MOT now has a superior, high-quality AV solution that delivers a seamless flexible learning experience. The distribution system enabled professors to deliver high-value, quality lectures with guest speakers to a wider audience, since the number of participants is no longer limited to in-person students.

“I feel that the energy of the classroom can now be shared with those who participate remotely. To create a sense of unity by eliminating the difference between online and onsite, that was our greatest focus.”

— Professor Hideki Wakabayashi
Director of MOT

While hybrid learning has its challenges, MOT has turned the situation into one with lasting benefits. Now MOT can provide the option of both in-person and remote learning in perpetuity, which provides an opportunity for even more inclusivity and diversity by allowing students who work or those located outside of Japan to enroll. Because of the



virtual aspect, professors can also record the lecture, which includes both classroom and chat discussions, providing an archive for on-demand learning.

Wakabayashi sees additional potential in the hybrid classroom solution made possible by Sony and Bose Professional. “It’s a great advantage to have solutions with both video and audio, and to be able to propose custom solutions for each learning space,” Wakabayashi explained. “I hope the knowledge gained at MOT will be further disseminated. For MOT students, learning is both an intellectual endeavor and entertainment. It is possible to deliver the entire lesson online with greater context using the power of technology.”

Wakabayashi continued, “I also feel that the more we expand the online aspect of our lives, the more we will realize and value the preciousness of experiences and encounters in real, actual places.”

The ideal educational environment for the next generation is cutting-edge video and audio technology that is intuitive and can amplify the excitement and enthusiasm of the classroom — both onsite and online. MOT has taken a leading step toward realizing this new future. ■

SYSTEM COMPONENTS

Videobar VB1 all-in-one USB conferencing device

ControlSpace EX-1280C conferencing sound processor

Panaray MSA12X steerable array loudspeaker

PARTNER: **SONY MARKETING, INC**



PANARAY **MSA12X**

The Bose Professional Panaray MSA12X is a self-powered digital beam-steering loudspeaker that enables improved room aesthetics, with outstanding vocal intelligibility and tonal consistency. The proprietary Articulated Array transducer configuration allows wide, 160° horizontal coverage throughout the room, and MSA12X's modular design allows building of vertical arrays using 1-3 units. Dante digital audio network interface comes standard for connection with other Dante-enabled products over Ethernet-based networks.



VIDEOBAR **VB1**

From huddle spaces to medium-sized rooms, the Videobar VB1 is an all-in-one USB conferencing device that brings premium audio and video to meetings. With six automatic beam-steering microphones, a 4K ultra-HD camera, and proprietary Bose Professional sound, the Videobar VB1 helps you huddle up and get more done.



CONTROLSPACE **EX-1280C**

A flexible DSP platform for scalable systems, ControlSpace EX conferencing processors have the features to support rooms of various sizes and the flexibility to meet future needs. An open-architecture, all-in-one design offers signal processing for integrated-microphone audio conferencing applications. Includes 12 mic/line analog inputs, 8 analog outputs, 8 AmpLink digital outputs, 12 acoustic echo cancellers (AEC), and 64 x 64 Dante® connectivity. ControlSpace Designer software simplifies the setup process with drag-and-drop programming, making configuration quick and easy.



Bose Professional serves many different markets, delivering great sound in venues all around the world — performing arts centers, theaters, places of worship, stadiums, restaurants, schools, retail stores, hotels, and corporate buildings.

We know that our pro audio customers depend on us in a unique way. This is your business, your reputation, your livelihood — not just an amp, not just a loudspeaker. So, when you buy a Bose Professional product, you get the full weight of the global Bose Professional team behind you — our time, support, and attention. We see every purchase as the beginning of a partnership.



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