Enhanced Comfort, Control, and Credentials for Cleveland Community College

For more than five decades, the people of Cleveland County, North Carolina, have been the happy recipients of many benefits thanks to their own Cleveland Community College. Since its founding in 1965, CCC has worked tirelessly to bring their vision to life—to build "a community of learners where the joy of learning is espoused, where hopes are realized, where dreams become realities, where excellence is an attitude instilled in all aspects of the institution, and where all learners participate in a dynamic process dedicated to making life better for all involved."

Fast forward to 2018, and CCC has made great strides in making their vision a reality. More than 3,000 students each year pursue their educational, career, and personal goals at CCC. They have the luxury of choosing from 26 programs of study within which they can select from 50 associates degrees, 104 certificates, and 43 diplomas. The college administration and staff are proud of the college's history and accomplishments, and they continue to look for ways to improve and

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advance the college. In 2015, their director of facilities identified an area where improvement and advancement could both be achieved.

Challenge

Mark Fox, CCC's Director of Physical Plant prepared a comprehensive inventory of the college's infrastructure, including its buildings, rooms, and the mechanical systems that served them. He found that a patchwork of decades-old and inefficient HVAC systems was serving more than 300,000 square feet of space encompassed by six campus buildings. Such a variety of systems meant the facilities staff spent a considerable amount of time and effort setting, checking, and adjusting the individual systems in an effort to provide a consistently comfortable indoor environment for students and staff. The college administration began to consider what type of solution would best address the facilities issue.

The answer came in the form of a U.S. Department of Labor grant through their "Trade Adjustment Assistance Community College and Career Training" (TAACCCT) program. TAACCT grants are awarded to community colleges to help them develop or redesign programs that align with local and regional businesses so students can obtain industry-recognized credentials that lead to good local jobs. CCC was awarded a TAACCCT grant to develop a mission critical operations (MCO) pathway. One component of the program would be to allow students hands-on experience with state-of-the-art, multifaceted HVAC systems. The project would include installation of an integrated HVAC control system throughout the campus and a "living lab" that would provide students the opportunity to operate, monitor, and adjust the campus system in real-time.

Solution

CCC solicited proposals for the project from qualified firms and awarded the project to Brady. "Brady stood out from the other bidders in many ways," Mr. Fox explains, "including that they were the only ones who took the time to visit our campus, tour the facilities, and talk with the staff and instructors to get a good understanding of our challenges and needs." Brady continued their collaborative approach during the design phase of the project by adjusting to the specific needs and preferences of the college. "Brady used an open design approach so we could get as much or as little as we wanted," describes Mr. Fox. "There were no hidden agendas, costs, or surprises during the design or the installation."

Brady made CCC's new MCO curriculum a top priority in the overall system design. They included non-proprietary equipment and software to ensure the college would retain flexibility in how they use, modify, and maintain their system. This aspect of the design will be especially important over time as the new curriculum is adapted to include new technology. For the current industry standards, Brady included a variety of component types in the design so students will gain experience with the different types of systems they are most likely to encounter in the foreseeable future.

Brady designed the HVAC control system to integrate with the campus power management and distribution systems. The

design included a dedicated heat pump for each classroom so the environment in individual rooms could be adjusted as needed based on times of use or vacancy, location within the building, and weather conditions. The control system was also tied in with the room scheduling system so the environmental conditions could be programmed ahead of time according to the class schedule.

When the time came for system installation, Brady "built a team that was second to none," reports Mr. Fox. "They did a great job of explaining to me what they were doing every single day and they found operational issues that we didn't know existed." For example, the team found and corrected a system that was routinely working against itself by switching from air cooling to air warming and back again. The Brady team also addressed known operational issues, such as an older electric boiler that only had on/off capability. Brady installed graded controls for the boiler that enabled sequenced stages so the boiler could be operated more efficiently.

The most exciting part of the project, for both the college and Brady, was the design and installation of a "living lab" for the new MCO curriculum. The lab was equipped with 15 Tridium® user interface student workstations that can connect with the campus HVAC control system. The instructor station was designed to interface with the campus system and to have access to the student workstations. This enables the instructor to design hands-on lessons that allow students to learn the nuances of managing a state-of-the-art control system, how to troubleshoot problems and correct them, and how to design site-specific control plans for optimal indoor environments.

Results

CCC is now enjoying the many benefits of their custom-designed system. The system is enabling precise environmental control of individual rooms, which translates to more consistently comfortable environments for students and instructors, as well as more energy efficient operations.

The facilities staff no longer need to run from building-to-building to make adjustments or deal with multiple control systems. As Mr. Fox explains, "Brady's design provides us with a single-seat, web-based control system for all of our buildings and each individual classroom." He also appreciates the real-time analytics that Brady gathers for the system—data that can be used to optimize performance as well as identify issues before they result in a breakdown. "Only Brady provides 24/7 real-time analytics so problems can be predicted and proactively addressed," explains Mr. Fox. "This helps prevent downtime due to sudden unexpected problems."
Everyone who interacts with the control system is benefitting from the user-friendly instructions developed by Brady. "We are all really impressed with the instructions for our new system," says Mr. Fox. "This includes our HVAC technicians, instructors, and students, as well as the room scheduler, all of whom find the instructions intuitive and flexible."

Credentials

Students in CCC's new MCO programs and enhanced HVAC program are reaping benefits from the new system that will impact them for years to come. The hands-on, real-time experience they gain in the

“living lab” is providing them with the knowledge and confidence that employers need. And on an even wider scale, CCC’s HVAC curriculum with the “living lab” is becoming a model for other colleges within the state of North Carolina and beyond.

The North Carolina Department of Environmental Quality (DEQ) recognizes CCC’s advanced, hands-on HVAC curriculum. In a recent letter, the DEQ Energy Office praised the college for their foresight in designing the curriculum and living lab and how it “helps grow the next group of technicians on the most cutting edge systems.”

Savings and Sustainability

The icing on this benefits cake is the energy savings and reduced carbon footprint realized by CCC. The college has reduced its energy consumption by an impressive 22 percent in two years and is now 10 percent more efficient than the community college average, saving them more than $60,000 annually. The DEQ Energy Office applauds the college on these achievements, recognizing CCC as a “leader in the State’s Community College System as other colleges look to identify where to put limited financial resources to control utility costs.”

Brady—partnering with educators to make their jobs easier and even more fruitful.