Celebrating 20 Years of the Engineering Communication Studio at XYZ University

Mr. Boz Bowles, Louisiana State University and A&M College

Boz Bowles is the Director of Student & Faculty Development at the LSU Chevron Center for Engineering Education.

Adrienne Steele, Louisiana State University and A&M College

Adrienne Steele has 25 years of experience in STEM education. Currently, Adrienne works at Louisiana State University as the Director of Student Leadership and Engagement in the Chevron Center for Engineering Education.

Dr. Rebecca Acosta Burdette
Annemarie Galeucia

Annemarie Galeucia, M.A., works for Communication across the Curriculum (CxC) at Louisiana State University (LSU). She is a Ph.D. candidate in LSU's cultural geography and anthropology program, and has over 10 years of qualitative research and teaching

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Abstract

This practice paper reviews the 20-year history of the Engineering Communication Studio (Studio) at Louisiana State University (LSU), highlighting its role in improving communication skills among engineering students to promote leadership, teamwork, and understanding ethical and professional responsibilities—key attributes of engineers according to the Accreditation Board for Engineering and Technology (ABET) [1]. The Studio was established in October 2005 as a joint initiative of the College of Engineering and Louisiana State University (LSU)'s campus-wide Communication Across the Curriculum (CxC) program, a program initially funded by an engineering alumnus, who agreed to a campus-wide program on the condition that it begin in engineering.

The Studio began as a support hub for the newly created communication-intensive (C-I) courses, but opportunities to study communications require contexts in which to occur, so the studio mission expanded to include a corporate-sponsored workshop series focused on leadership skills development and a tutoring program for first-generation students and underrepresented minorities in engineering. The Studio also became a new home for several existing programs, including engineering supplemental instruction and peer mentoring. It is also part of an articulation plan with the college's study-abroad program. The Studio has evolved into a hub of student learning and leadership, which encouraged a significant investment from a major energy company, and expanded the Studio and several other student services into a new entity: the LSU Chevron Center for Engineering Education (Chevron Center).

Students who participate in our programs do so voluntarily, as do the faculty who certify their courses as C-I courses. Participation numbers indicate excellent buy-in by both communities. Last year, the Studio saw 14,254 unique student visits. Since the CxC program's inception, C-I courses in the College of Engineering accounted for over 23% of all C-I courses, and 27% of students enrolled in these courses across the university's eleven undergraduate colleges.

The CxC program was initially part of LSU's Quality Enhancement Plan (QEP) for the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) accreditation in 2004. From 2005 to 2015, the College of Engineering accounted for over 40% of the program's participation. High levels of faculty and student engagement have been essential, as shown by strong participation numbers. In the current cycle, the CxC program was again chosen for the QEP, with the Engineering Communication Studio as a key feature. The Studio was a highlight during the SACSCOC campus visit, showing its ongoing contribution to LSU's educational goals. The program's quality was also recognized in two ABET reviews, where it was highlighted as a strength.

This paper outlines the achievements and lessons learned over two decades, emphasizing the continued importance of communication and leadership skills in engineering education. The success of the Chevron Center can serve as an example to other institutions on how to fully

embed these important skills into the engineering curriculum, other academic programs, and student organizations.

Humble Beginnings

In the late 1990s and early 2000s, engineering education reached a pivotal point. Industry leaders, such as Boeing, identified a growing need for engineers to expand their skill sets beyond traditional technical expertise. Boeing's seminal list of "Desired Attributes of an Engineer" underscored the importance of communication skills, global awareness, ethics, teamwork, and lifelong learning [2]. This shift marked a broader recognition that the challenges engineers faced were increasingly multidisciplinary, requiring a new approach to education. Organizations such as the National Academy of Engineering (NAE) and the American Society of Civil Engineers (ASCE) also contributed to this evolving perspective. NAE's publication *The Engineer of 2020: Visions of Engineering in the New Century* [3] and ASCE's *The Vision for Civil Engineering in 2025* [4] called for, among other challenges, embedding so called "soft skills" into engineering education to better prepare students for professional roles in a rapidly changing world. (We prefer to refer to them as "essential skills.") In response, the Accreditation Board for Engineering and Technology (ABET) updated its student outcomes to include communication, ethics, and teamwork as essential components of an engineer's education [1]. However, these changes presented a challenge: many engineering programs struggled to integrate these skills into their curricula, which had traditionally focused almost exclusively on technical content. Communication, in particular, was viewed by many in engineering as the purview of English departments, leaving many engineering educators at a loss for how to address these new requirements.

CxC in Engineering: Program Overview

The Communication Across the Curriculum (CxC) program at LSU was established in 2005, in part, to address these needs. CxC is a campus-wide entity whose mission is to improve undergraduate communication skills in the disciplines. Pillars of this program include 1) Communication-intensive (C-I) courses; 2) Studio support; 3) motivational programs; and 4) faculty development [5].

1) C-I Courses focus on any two of CxC's four communication emphases—written, oral, visual, and technological. Faculty review requirements and submit an application explaining how the requirements are met. These requirements include a significant grade weight associated with communication assignments, informal work to develop and practice communication skills, and a formative feedback loop to help students better understand what is expected of them.
2) The Engineering Communication Studio is one of three studios on campus. Located in the engineering building, the studio contains modular seating, computer workstations, laptop docking stations with dual monitors, 3D printers and scanners, and a variety of audio-visual equipment for checkout.
3) Students who are successful in C-I courses (minimum grade of B) and take at least four C-I courses touching on all four modes are eligible for two programs celebrating their success. The LSU Communicator Certificate is the most recent, launched in 2016. This

program requires students to be successful in classes and write a prompted reflective essay regarding their experiences. The LSU Distinguished Communicator Award goes beyond the Certificate; in addition to requiring the courses and reflection, students are asked to work with a faculty advisor to build a developmental e-portfolio to demonstrate their discipline-specific communication skills. Students who complete the Distinguished Communicator program earn a medal and a notation added to their LSU transcript.

4) The Faculty Summer Institute was initially a 3-day faculty development program aimed at teaching C-I pedagogy, which included active learning techniques, as well as elements of syllabus and assignment design. It has since evolved into an ongoing workshop series called the C-I Teaching Lab (CITL). The CITL events are more flexible, addressing specific topics and contexts. For example, a recent workshop focused exclusively on formative feedback. Another addressed student perceptions of C-I pedagogy. Because they are shorter, CITLs can happen whenever is convenient for all the stakeholders.

At the time of our founding, the internet was evolving rapidly, and new opportunities for technology in education were emerging. LSU's CxC recognized the importance of technological communication and included it as a discrete communication mode—rather than simply a tool—alongside writing, speaking, and visual communication. This decision positioned the program as forward-thinking and aligned with the changing landscape of both engineering education and the engineering industry.

The CxC program was launched with the help of a generous donation from an LSU engineering alumnus who believed in the need to improve communication skills among engineers. While the original intent was to focus solely on the College of Engineering, the LSU Foundation proposed expanding the program to serve the entire campus. The donor agreed, provided the program began with the College of Engineering, where the need was seen by the donor to be greatest. This decision immediately led to the Engineering Communication Studio becoming the first outpost for CxC on campus, a joint initiative of the College of Engineering and CxC. The campus-wide program was also a key element of LSU's Quality Enhancement Plan (QEP), developed for the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) 2004 reaffirmation cycle. While assessing communication artifacts for accreditation was challenging, the data collected demonstrated the program's value and helped support the College of Engineering's ABET accreditation efforts.

In 2024, C-I Courses and the resources that support them, including the Engineering Communication Studio, were selected to be the QEP for the 2024-2029 cycle. CxC's C-I pedagogy was cited as a high-impact teaching approach that positively influenced undergraduate learning and retention. The parts of CxC's programming included in the QEP were rebranded as "Geaux Communicate," and when SACSCOC representatives came for the required site visit, the Engineering Communication Studio was featured [6].

Investment in a Discipline-Specific Space

The Studio became a central feature of the program soon after its creation. Its prime location in Patrick F. Taylor Hall, the engineering building on campus, symbolized the importance of communication within the engineering curriculum. When the engineering building was

renovated in 2016, the Studio was moved to an even more prominent location, and the entire space was rebranded as the "Chevron Center for Engineering Education for Engineering Education" The Studio was designed to encourage the collaboration and communication skills listed as ABET Student Outcomes. Modular furniture, whiteboards, and modern technology like 3D printers and scanners provided students with resources to work on communication-intensive projects, create prototypes, and practice communication skills in a real-world context.

The College of Engineering also invested in skilled staff to manage the Studio. The first manager, a retired professional engineer (PE), brought decades of industry experience to the role. Two full-time technical communication instructors, a graduate assistant, and engineering student workers rounded out the team, ensuring the Studio addressed both academic and professional needs. While studios in other colleges were initially managed solely by graduate students, the College of Engineering hired—in addition to the retired P.E.—two full-time technical communication instructors and a graduate assistant. The instructors were chosen for their backgrounds in traditional communication-related fields (English, Communication Studies, etc.) as well as their backgrounds with STEM education (professional writing, technical writing, etc.). Additionally, all student workers in the Chevron Center are required to be engineering majors. This is to build community between students and staff, as well as capitalize on the student workers' general familiarity with engineering coursework. The bulk of the student services are provided by the student workers. By investing in high-profile space and qualified professionals, the College of Engineering ensured that they would see a suitable return on their efforts.

Building a Culture that Values Communication

From the start, CxC prioritized creating a culture where communication skills were seen as essential for engineering success. The Faculty Summer Institute played a key role in this effort, offering workshops on how to incorporate communication into coursework. Faculty could access support for designing assignments, creating rubrics, and delivering class presentations that aligned with the program's goals of improving undergraduate communication skills in written, spoken, visual, and technological communication modes. Students also benefited from the Studio's resources. In addition to one-on-one feedback on assignments, they had access to computers, audiovisual tools, and relaxed spaces for group work. Programs like the LSU Distinguished Communicator encouraged students to take their communication skills seriously and celebrate their achievements.

While building community in the College of Engineering was important to us, it was also important that we connect with Studios in other disciplines. While engineering students may be the best group to support other engineering students in the Studio, there are ample opportunities to learn from the other studios on campus about how conventions differ from discipline to discipline, as well as how they are similar. Opportunities for interdisciplinary events allow for learning across disciplines, or "cross-pollination" of ideas, as we often call it. This helps engineering students learn to communicate with a wide variety of audiences, an ABET student outcome [1].

Leading the Way on Campus

The College of Engineering quickly became a leader in integrating C-I courses into its curricula. Engineering courses made up a significant portion of the university's C-I offerings, and the Studio became one of the most frequently used resources on campus. From 2005-2023, nearly 24% of all certified courses were within the College of Engineering, and students in this college have accounted for over 27% of the C-I course enrollment. This impact is more than double the expected reach, as the College of Engineering is one of 11 colleges on campus and accounts for only 12% of the university's total enrollment. In sum, the College of Engineering has impacted 40% more students than any other college at LSU. Additionally, student usage of the studio has reached epic proportions, with 14,254 unique visits recorded last year.

The program's success influenced other departments to adopt similar approaches, creating a broader culture of communication excellence at LSU. As other colleges began to expand their course offerings, engineering students were given the opportunity to enroll in a greater variety of C-I courses in other disciplines, such as science and humanities, broadening their understanding of communication in different contexts.

Additionally, C-I courses drive traffic to studios since the Studio mission is to support C-I courses. When students frequent the studios, they are more exposed to studio programming, which drives C-I course enrollment. This connection between the physical Studio and the programs housed within it creates a reinforcement cycle that illustrates how all 4 pillars of the CxC program are interwoven. Topics introduced in C-I courses, reinforced via studio resources, are often put into practice in extracurricular, professional development activities, providing opportunities for experiential learning that could be difficult to provide in a traditional class.

Expanding the Mission

Over time, CxC expanded its mission to address a wider range of skills. Most modern communication is multimodal and often depends on technological tools to execute. The program embraced multimodality, moving beyond individual communication modes (writing, speaking, visuals) to integrated approaches that reflected the complexities of modern engineering work. Engineering courses at LSU rarely focus on discrete modes of communication, even when they are certified in only one mode. This is akin to presenting a technical paper without including figures and tables. Technological literacy also became a priority. From digital portfolios to virtual collaboration tools, the program adapted to new technologies and prepared students for a workforce that increasingly relied on digital communication. This adaptability proved crucial during the COVID-19 pandemic when the CxC program's experience with online learning positioned it as a campus leader during the forced shift to remote education.

In 2016, the Chevron Center for Engineering Education learned through focus groups that there were still areas where we were not as effective as we would like to be [7]. A key finding of this assessment was that although students were confident in their basic communication skills, they were worried about how those skills might apply in professional settings. Additionally, we learned that some aspects of interpersonal skills are difficult to implement in a traditional engineering classroom. Because many of the skills associated with professional development are

at their core communication skills, the Chevron Center's mission was expanded to include a variety of extracurricular programs.

In 2017, in response to our focus group findings, several other student programs were merged with the Engineering Communication Studio, positioning the Chevron Center for Engineering Education as the hub of student activity and learning for the College of Engineering. These programs included supplemental instruction for historically difficult gateway engineering courses [8]; a tutoring program specifically created for engineering first-year students with a focus on serving students from underrepresented groups and first-generation students [9]; a scholarship-based leadership program [10]; and the Society of Peer Mentors, a large, service-oriented student organization who leads the College's freshman bridge camp [11] – [13]. Many of these programs were founded as a result of two consecutive NSF STEP awards, most of which were institutionalized in the college at the end of the funding period [14]. The Chevron Center's mission thus grew to encompass a wider range of student success initiatives with the overarching goal of increasing engineering student retention and developing career-ready engineers upon graduation.

Current Operations and Future Directions

Today, the Chevron Center for Engineering Education continues to grow. Because communication is a foundational element for many institutional priorities, such as teamwork, leadership, ethics, and entrepreneurship, it offers resources and programs that address these topics. The studio supports study abroad programs, tutoring services, workshops, and student organizations, providing a wide range of opportunities for students to develop their communication skills in a variety of contexts.

The Studio has also evolved into a welcoming space for students from a wide range of populations. The full-time staff members that work in the Studio share an open-door philosophy and are trained Safe Space allies. The staff, at all levels, strive to make everyone feel welcome and valued by taking time to answer questions or meet with students even when it is inconvenient. We are committed to creating pathways for students' professional and personal development, even in times where shifting policies have complicated this desire. We try to make student needs our first priority.

A recent restructuring divided leadership into curricular and extracurricular roles, making it easier to manage the program's growing scope. Looking ahead, the studio plans to incorporate artificial intelligence into its teaching and operations, ensuring it remains a leader in communication education.

Lessons Learned

Invest in Dedicated Resources

The success of the Engineering Communication Studio demonstrates the importance of investing in spaces and tools tailored to specific academic needs. A central, easily accessible, well-equipped studio with modular furniture, whiteboards, and cutting-edge technology like 3D

printers created a welcoming environment for students to learn and collaborate. This investment was not just about providing tools, but about signaling to students and faculty that communication is an essential part of engineering education.

Invest in Experienced Staff

The decision to hire a retired PE with decades of professional management experience as the first Studio Director not only helped make strategic decisions in the beginning, aligned with departmental and institutional priorities signaled to students and faculty alike that these changes in engineering curricula would be permanent. This improved both student and faculty buy-in to the program.

Focus on Student Needs

Understanding what students need and providing tailored support is critical. Surveys and focus groups revealed that students valued communication skills like listening and interpersonal interactions, which are often difficult to address in traditional classroom settings. By offering one-on-one feedback, flexible learning spaces, and access to faculty and peer mentors, the studio ensured students had the resources to succeed.

Being responsive to student challenges also builds community. Recently, our staff observed changes in the way the Studio was being used. As laptops became more powerful and ubiquitous, students had less need for lab computer workstations. This would have been unthinkable a few years ago, but students were often moving keyboards and mice aside to make room for laptops. Observing this trend created an opportunity to better meet modern student needs. Therefore, lab computer stations in the Center were reduced from 24 to 16 and replaced with laptop docking stations so that students can connect their own machines to multi-screen displays with full-sized keyboards.

In the past 2 years, the Studio has also offered office hours to other student services staff. A career coach kept regular hours in the Chevron Center, which helped increase student awareness of the Career Center's services. An Intercultural Communication Coach and a Study-Abroad Advisor have also started holding office hours in the Chevron Center, which makes it easier for students to connect with these offices and their services.

Most recently, the Studio has begun to offer communication coaching, a service previously addressed by the University Writing Center until it was closed due to budget cuts in 2015. Student coaches now help engineering students in the Chevron Center, eliminating the need to walk across campus to another studio for writing help.

Align with Goals

Institutional support is vital for sustaining programs over the long term. The Engineering Communication Studio tied its initiatives to the university's broader strategic plans and decanal priorities, which helped secure funding and administrative backing. Aligning with accreditation goals, such as ABET's Criterion 3, further underscored the studio's value and relevance.

As entrepreneurship became a priority of the college, the Studio was able to partner with faculty in computer science, the campus-wide CxC program, and the AAC&U to develop entrepreneurship programs in the College. This effort helped drive C-I courses in Computer Science, from one approved C-I course to 6 C-I courses.

Embrace Change

The studio embraced technological advancements, even when they were unfamiliar or posed logistical challenges. For example, integrating 3D printing technology into its resources helped students learn about emerging manufacturing methods. Similarly, the program's focus on digital portfolios and online collaboration tools prepared students for the demands of modern communication. These decisions positioned the studio as a forward-thinking resource, ready to adapt to the evolving needs of both students and industry.

Looking at the future, we see additional changes–and opportunities. LSU's new library is projected to be completed within the next 5 years and relocated near Patrick F. Taylor Hall. Its completion will further change the way we accomplish our mission in the Studio. For example, the campus-wide CxC program may take on more AV checkout or communication coaching. Removing those duties from our current operations may enable student workers to focus on more impactful engineering activities, allowing for new learning collaborations in the Chevron Center.

As the Engineering Communication Studio celebrates its 20th anniversary, it stands as a model for integrating communication into engineering education. Its focus on real-world skills and continuous improvement ensures that LSU's engineering students are prepared for the challenges of today's workforce and beyond.

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