

Bringing Research Cyberinfrastructure to Smaller Institutions and Community Colleges

Findings from a Landscape Study

March 24, 2022



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Landscape Survey

- Objective – understand the landscape of CI adoption at smaller schools and community colleges
 - Identify opportunities and challenges
- Interviewed several CIOs and university administrators in one-on-one and group interview sessions to develop an understanding of success stories and challenges
- Engaged the community via weekly meetings – volunteers are CIOs and senior faculty members at smaller schools and institutions
- A survey of smaller institutions and community colleges with planned CC* deployments completed

Workshop - Premise

“We need to raise awareness of available resources and networks among this community. There are several opportunities to collaborate and learn from organizations and institutions proficient in computing”

BRICCs Landscape Workshop

- Held at South Plains College in Levelland, TX in a hybrid format on October 18-19, 2021.
- The workshop was co-located with Texas Association of Community Colleges CIO group.
- Faculty, administrators, R&E network providers, industry participants, and stakeholders responded to a community-wide invitation.
- 110 attendees including 25 in-person participants.
- Like the NSF CC* program, Day 1 focused on technology. while Day 2 focused on the academics and research that use CI.
- Groups supporting CI facilitation, curriculum, internships partnered on panels and presentations with faculty who have adopted CI products.

Workshop Agenda

- Presentations, panels, round-table discussions
- Like the CC* program, the workshop focused on CI and research
- Day 1 focused on technology for research and academics
 - Opportunities for funding and organizations supporting Ci
 - Compliance, security, networking, and other CIO priorities
 - Lessons learned from implementations at smaller schools
- Day 2 focused on the academics and research that use CI
 - NSF CORD and Department of Labor Internships
 - Research at Community Colleges
 - Community College student perspectives

u.tamu.edu/briccs/workshop_2021.html

Workshop Findings - General

1. Research and academic programs at four-year and two-year institutions are geared and structured differently . The larger community is not aware of these differences.
2. There is no documentation of learnings from CI implementations. Smaller institutions tend to learn about the challenges in engaging in research computing while integrating CI resources onto their campuses.
3. Cybersecurity, compliance, and data-storage continue to remain issues of concern at institutions of all sizes

Workshop Findings – Funding Agencies

1. Small and/or rural colleges typically do not have the funds to support on-campus advanced cyberinfrastructure. CIOs in larger/urban settings may have more flexibility to adopt these practices.
2. Federal programs are of considerable interest to both CIOs and faculty. Funds from CARES act were available to several CIOs but usage was varied across institutions. The NSF CC* and MRI programs offer other opportunities.
3. Federally (CC*, HEERF, CARES) available funds have alleviated some of the on campus-networking challenges. Expertise is, however, necessary to manage these networks. Purchasing “network-consulting” support for higher education is an emerging opportunity.

Workshop Findings - CIOs

4. CIOs in small and/or rural colleges do not have the funds to hire the number of technicians or the technicians with the level of skill to fully accommodate the technology support of the administration and faculty as do the larger and more urban community colleges.
5. CIOs at community colleges have a leadership and operational function. As such, institutional leadership have to work with CIOs to support activities that go past day-to-day functions and expanding.

Workshop Findings - Academic Programs

6. There is a vibrant research culture in preparing students for careers in computing.
7. There is limited curriculum that leverages research computing at many smaller-institutions and community colleges. Cloud computing curriculum could be leveraged.
8. For CCs, collaboration with various industries is needed to develop projects that truly relate to vocational technical problems.
9. While community colleges would like to incorporate more research and data analytics into their curriculum, it is difficult to find the time to develop such projects.

Workshop – Lessons Learned

1. A periodic convening of CIOs, program leaders, and faculty at small colleges and universities is a good thing but separate working convenings on specific projects or topics for the development of curriculum modules is important.
2. These convenings should be either in-person or virtual but not both to ensure better interaction of participants.
3. Explore new models of offering computing resources for smaller schools and community colleges. These models could include a partnership model.

Recommendations for BRICCs

1. Create further awareness of the BRICCs grant and the challenges small colleges and universities face related to advanced CI adoption.
2. Hold quarterly workshops open to statewide or regional participation.
3. Workshops should focus on project development, faculty training on how to incorporate projects into curriculum, sharing of specific projects used for various industries.
4. Develop sub-groups for networking, and sharing resources and expertise.
5. Present at relevant conferences organized by groups such as Texas Association for Career and Technology Educators (TACTE) and the Texas Community College Teachers Association (TCCTA).

Recommendations for Funding Agencies

6. While most community colleges have experience working with state agencies, support structures are needed to help faculty and CIOs submit grants to Federal funding agencies.
7. Evaluation criteria for proposals from community colleges should be established and clarified by Federal agencies.
8. Equipment funding opportunities should also include support for day-to-day staffing.

Recommendations for the Community

9. Mechanisms need to be identified to help CIOs better interact with their faculty, and communicate findings to the institution's administration.
10. New models of sharing computing between smaller institutions need to be explored. Perhaps develop computing services in which collaborators share a resource.
11. Develop a standard vernacular. Terms such as “CI”, “research computing”, “networking” confused several attendees.
12. Leverage trusted relationships between the RENs and flag-ship institutions for convening communities and workshops.

Products and Steps Forward

1. Videos from the BRICCs landscape-workshop are available on YouTube.
2. Organized a session at the Texas Community College Teachers Association Conference (TCCTA) in Dallas, on Mar 5, 2022.
3. A paper describing these findings will be submitted to the PEARC 22 conference proceedings journal.
4. Collaborate with the Eastern Regional Network (ERN) community to organize a computing-models BRICCs workshop in August 2022.
5. Organize a BRICCs Birds of a Feather at the Supercomputing 2022 (SC22) conference.

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Workshop Organizers

- Texas A&M University
- Lone Star Education and Research Network (LEARN)
- University of Texas, Austin
- San Jacinto College
- South Plains College
- Texas Association of Community Colleges - CIO group



Workshop Speakers and Panelists

- Dr. Dhruv Chakravorty
- Mary Goldie
- Amy Schultz
- Prof. Chuck Mize
- Kevin Thompson
- Jason Zurawski
- Prof. Emily Hunt
- Prof. Alex Feltus
- Dr. Forough Ghahramani
- Adrienne Garber
- Dr. Tim Cockerill
- Prof. Izzat Alsmadi
- Dr. Lisa M. Perez
- Dr. Laci Alexander
- Dr. Richard Knepper
- Prof. Soumya Mohanty
- Prof. Emily Hunt
- Robert Stanicic
- Dr. James Van Howell
- Hope Cotner
- Ann-Claire Anderson
- Greg Mitchell
- John Hark
- Prof. Sarah Janes
- Prof. Rajiv Malkan
- Prof. Chuck Mize
- Dr. Stephen Dodd

Institutions Represented at the Workshop

- Alamo College
- Alvin Community College
- American Museum of Natural History
- Berkeley labs (ESNet) and EPOC
- Blinn College
- Brazosport College
- Center for Occupational Research and Development
- Clarendon College
- Clarendon College
- College of the Mainland
- Collin College
- Colorado School of Mines
- Dallas County Community College District
- Del Mar College
- Dell Technologies
- Felidae Conservation Fund/Bay Area Puma Project, Cures Within Reach, Peace Innovation Institute (Stanford University and The Hague), etc.
- Florida International University
- Galveston College
- Gonzales Group LLC
- Grayson College
- Herzing University atlanta
- Howard College
- Internet2
- International Business Machines (IBM)
- John Jay College of Criminal Justice
- Kilgore College
- Lee College
- Lone Star College - Montgomery
- Lone Star Education and Research Network
- Midland College
- National Science Foundation
- Navarro College
- NJEdge
- North Arkansas College

Institutions Represented at the Workshop

- North Central Texas College
- Odessa College
- Old Dominion University
- Panola College
- Pittsburgh Supercomputing Center
- ResearchAssociates.org
- Sam Houston State University
- San Jacinto College
- Santa Clara University
- Semper Cogito
- Silicon Valley CTE (Career Tech High school)
- South Plains College
- TACC-CIO
- Tarrant County College District
- Temple College
- Texas A&M University
- Texas A&M University, San Antonio
- Texas Advanced Computing Center, University of Texas at Austin
- Trinity Valley Community College
- University of Alabama at Birmingham
- University of California Merced
- University of California San Diego
- University of Central Florida
- University of Colorado
- University of Michigan
- University of Nevada, Reno
- University of Tennessee Chattanooga
- University of Texas Rio Grande Valley
- University of Utah
- University of Wyoming
- Utah Valley University
- Victoria College
- Waukesha County Technical College
- West Texas A&M University
- Western Texas College
- Wharton County Junior College

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