

The Role of Community Colleges in Expanding Capacity in Undergraduate AI Education

NSF LEVEL UP AI Workshop Recommendations



CRA

Computing Research
Association

July 2026

Introduction

As part of the NSF LEVEL UP AI project, the Computing Research Association (CRA) and New Mexico State University convened educators, researchers, and professionals across the computing community to build consensus on strategies to increase capacity for undergraduate Artificial Intelligence (AI) education. The LEVEL UP AI Atlanta (December 2025) and Phoenix (January 2026) design workshops addressed key bottlenecks in AI education infrastructure, which had been identified in Spring 2025 roundtable discussions (Cowit et al., 2025). The *Designing Strategies to Lower Barriers for Community Colleges* in-person design workshop only occurred at the Phoenix workshop (the only workshop with community college participants) and was attended by 10 participants from 10 institutions ([Link to Contributors](#)). Utilizing a backwards design methodology (Wiggins & McTighe, 2005), this workshop session facilitated the creation of this recommendations document.

Community and technical colleges are often promoted for their shorter and more affordable two-year programs, have large and heterogeneous student bodies (e.g., traditional transfer students, high school partnership programs, workforce upskill/reskill participants), and strong education infrastructure already in place. Given this, they are well-positioned to take a key role in increasing undergraduate AI education capacity in the United States (Penprase, 2026; Servin et al., 2024; Servin & Smith, 2025). While well-positioned, community colleges do face challenges in increasing capacity for AI education and workforce demands. This document outlines targeted interventions to help community colleges field cutting-edge AI education programs.

Recommendations and Reflections

Invest in Community and Technical Colleges to build a strong AI Education Infrastructure

Community colleges are well-positioned to prepare the nation's AI workforce. They already educate nearly half of all undergraduates (Capitalizing on Postsecondary Education to Develop In-State Talent, 2025) in the United States, through programs rooted in regional economies that are built to adapt quickly to industry demand. While predominantly four-year universities may be dominating the conversation about AI research and advanced education, community colleges play a key role in preparing the AI technicians and deployers who will oversee the use of AI in hospitals, manufacturing plants, logistics hubs, public and government agencies, and most small- to mid-sized businesses. These jobs may include machine learning specialists, data stewards, AI model auditors, prompt engineers, AI risk managers, and applied AI technicians.

Community colleges are also vital to America's AI competitiveness. Community colleges are already working to scale their ability to advance AI education, which will only grow in success through intentional commitments to resourcing our nation's community colleges. Across the country, community colleges are integrating AI education within their core curricula, from introductory courses to specialized degrees, such as associate, certificates of completion, and occupational skills awards (Servin et al., 2024). With the right investment and coordination, every community college in America could offer an applied AI credential within five years. With this range of access, any student who wants to become an AI researcher or developer could start through a community college pathway. These varied credentials create learning and career pathways for millions of workers equipped to take on new roles in an economy increasingly shaped by automation and data.

Establish Infrastructural Supports for Community and Technical Colleges

Support Efforts to Create Regional Technology Hubs

Regional Technology and Innovation Hubs, existing and in development, should create dedicated plans for working together to support community colleges. This plan should include developing strong curriculum guidelines, with guidance from industry and alignment with the first two years of 4-year curricula. Additionally, these hubs should support mid-career enhancement programs to allow faculty AI preparation, professional development, mentorship, and externships. Establishing these hubs could also assist in providing community colleges with access to hardware (including maintenance) and software infrastructure for educational purposes. Finally, regional tech hubs should prioritize industry partner members that support

national efforts in AI education for community colleges through advisory board membership, real world scenario projects, speaker opportunities, infrastructure support, and direct funding support. All educational entities (K-16), professional organizations, and industry partners of the Regional Technology Hub would be expected to grow and contribute to the creation of shared resources that can be adopted and/or incorporated directly into curriculum and coursework.

Support Curricular Development

Community Colleges need strong models for AI education curricula that are targeted to support their populations. Historically, the ACM Committee for Computing Education in Community Colleges (CCECC) has developed curricular guidelines for two-year computing programs for more than 50 years. These guidelines are informed by four-year curriculum models and related national efforts. Importantly, the guidelines extend beyond traditional undergraduate preparation to incorporate industry/workforce perspectives and needs for emerging computing areas, such as data science, cybersecurity, and AI. In a similar fashion, the Centers of Academic Excellence in Cyber Defense (CAE-CD) and CyberAI Program of Study (PoS) designations have recognized two-year institutions as leaders in cybersecurity and cyberAI education. These designation processes have shaped curriculum development, strengthened community practices, and helped formalize competency-based approaches through the NICE Workforce Framework for Cybersecurity (Alsmadi, 2019). These initiatives can be used as an effective model to ensure the impact of community colleges within the AI space. Additionally, through industry advisory committees (IACs), a core requirement for many 2-year programs, the curriculum will also need to be updated. These committees play a critical role in maintaining compliance with state educational authorities, validating regional workforce demand, and ensuring that programs remain aligned with evolving industry needs. As community colleges take up the AI education charge, IACs should continue to be a vital bridge between academic programs and local employers, reinforcing community colleges' workforce-centered mission.

National Infrastructure for Community Colleges

Infrastructure support for students and educators to incorporate advanced technology in coursework is essential (outlined in a LEVEL UP AI recommendation report (Gropp et al., 2026)). In 2025 and 2026, CRA assisted in expanding and adopting the role of community colleges in AI research and classroom education through a National AI Research Resource (NAIRR) Pilot Classroom [Conference](#) focused on community colleges. Additionally, the train-the-trainer model of the [National Applied AI Consortium](#) (NAAIC) has proven essential to support community and technical colleges in developing and launching AI academic programs. In just one year, NAAIC, a National Science Foundation-funded initiative, has equipped more than 2,000 faculty members with AI professional development opportunities, impacting over 50,000 students nationwide. With respect to instructional resources, a curated AI education library could be created, modeled after OERCUNY or CLARK. Continued opportunities like these through CRA, NAAIC, and other computing organizations will be essential to building the nation's capacity to develop the required AI workforce, although new efforts may be necessary

as well. One important need is for community college staff tasked with managing federal grant funding once it is awarded, a current gap.

Professional Development for Faculty

Time Allowance and Dedicated Funding for Learning Emerging AI

Education Content

As AI rapidly transforms every sector of the workforce and continues to evolve at a rapid pace, faculty need affordable, flexible, and hands-on training that reflects real-world applications and industry standards and needs (outlined in a LEVEL UP AI recommendation report (Touretzky et al., 2026)). When community college faculty have access to high-quality AI professional development, whether through micro-credentials, industry-supported workshops, online learning pathways, or collaborative teaching communities, they can integrate AI across programs in the college, strengthen AI literacy, and prepare students for the careers of the future. In short, community college faculty require dedicated, *funded* time (e.g., stipends, course releases) and access to high-quality professional development programs to effectively learn and adopt new instructional content. We see the need for partnerships that are ongoing initiatives responsive to the rapid pace of change in the field.

Partnerships with Industry to provide AI Professional Development

Equally essential is the active involvement of industry and employer partners who understand emerging tools, workplace expectations and needs, and the evolving skills gap. Partnerships with industry not only enhance the relevance and quality of professional development for faculty but also help build a talent pipeline that benefits students, relevant employers, and regional economic development.

Address Pathways in AI Education in CS and Beyond

Ecosystem Partnerships with CC, 4-Year Institutions, Workforce

Strong partnerships with four-year institutions are critical for developing strong transfer pathways. By developing Memorandums of Understanding and/or articulation agreements, a set of curricular guidelines that mirror the first two years of AI requirements could be shared. Establishing seamless transfer pathways, supported by intentionally coordinated advising, will enable efficient and cost-effective completion of baccalaureate degrees.

Integrate AI Education Responsibly throughout the Community College

Artificial intelligence now touches nearly every discipline within community colleges, across the full spectrum of academic and technical programs. Across disciplines, AI is reshaping the

knowledge and skills students need to thrive in the modern workforce. There is a need to support faculty teaching practices, adopt syllabus-level AI usage policies for students, and incorporate AI ethics into gateway courses to broaden AI learning and improve transfer and workforce readiness (Azhar, 2026). Community colleges are well-positioned to respond to this shift by embedding AI concepts, tools, and applications across their curriculum, integrating data-driven decision making into business courses, utilizing intelligent diagnostics in automotive programs, applying machine-learning-enhanced tools in healthcare, and introducing automation and robotics into advanced manufacturing pathways. Developing an institution-wide integration strengthens career readiness, supports local industry needs, and ensures that students enter the workforce not just as workers, but as informed participants in an AI-driven economy. All graduates should be able to evaluate and engage with AI tools responsibly.

Other Challenges

Developing AI credentials at community colleges brings a set of interconnected challenges that extend well beyond curriculum design. Institutions must establish clear, thoughtful policies governing the ethical use of AI by faculty, staff, and students, addressing issues such as academic integrity, data privacy, transparency in AI-assisted work, and appropriate use of generative tools in coursework and assessment. At the same time, colleges face workforce challenges: hiring or upskilling faculty with the technical expertise, industry experience, and pedagogical grounding needed to teach AI-related content. This often requires revising job descriptions, offering competitive salaries, and creating professional development pathways to retain qualified instructors. Additional challenges include ensuring equitable access to computing resources, integrating AI tools into existing learning management systems (LMS), and fostering cross-departmental collaboration to embed AI literacy across disciplines rather than isolate it within a single program. Successfully launching AI credentials, therefore, requires a coordinated approach, aligning funding, policy, hiring, training, infrastructure, and academic culture to support sustainable and responsible AI education.

Conclusion

The path toward a robust, AI-ready national workforce runs directly through the classrooms of community and technical colleges. As the findings from the LEVEL UP AI workshops demonstrate, these institutions are not merely supporting players; instead, they are the essential infrastructure for democratizing AI expertise and ensuring regional economic resilience. Realizing the ambitious vision of an applied AI credential in every community college within five years requires more than just curricular updates; it demands a systemic commitment to faculty empowerment, regional industry integration, and the removal of institutional barriers. By investing in these colleges today, we do more than fill immediate technical roles; we ensure that the next generation of machine learning specialists, data stewards, and AI auditors reflects

the true diversity of the American workforce. Through coordinated national support and local innovation, community colleges can transform the challenges of this technological shift into a sustainable pathway for millions of students to lead in an AI-driven economy.

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Suggested Citation

Williamson, M., Servin, C., Azhar, M. Q., Delgado, A., Pontelli, E., Jones, S. T., & Cowit, N. Q., (2026). The Role of Community Colleges in Expanding Capacity in Undergraduate AI Education: NSF LEVEL UP AI Workshop Recommendations. Washington, D.C.: Computing Research Association (CRA).

<https://cra.org/wp-content/uploads/2026/07/The-Role-of-Community-Colleges-in-Expanding-Capacity-in-Undergraduate-AI-Education--NSF-LEVEL-UP-AI-Workshop-Recommendations.pdf>

Acknowledgement

We greatly appreciate the efforts of the [NSF LEVEL UP AI Advisory Board and Leaders of Partnering Organizations](#), who are foundational to the success of this project.

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This material is based upon work supported by the U.S. National Science Foundation (NSF) under Award No. CNS-2434416.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.