

STEM Nights in Rural Maine: Connecting Classrooms, Careers, and Communities

by Kate Mahan and Rachael Dektor

INTRODUCTION

Across the United States, rural communities face persistent challenges in accessing emerging technologies and high-quality computer science education. In these settings, schools often serve as critical social and civic hubs, offering not just academic instruction but also community-building events and public services (Crumb et al. 2023). Ensuring equitable access to digital literacy and computer science pathways has become a pressing need, especially in regions where broadband access, exposure to industry careers, and staffing capacity remain limited (Eppeley et al., 2018; Penuel et al. 2020).

In Maine—the second most rural state in the country, where 61.5% of the population lives in rural areas¹—educators and researchers have partnered through the Harold Alfond Foundation-funded STEM Workforce Ready Maine 2030 (WFR) initiative to expand computer science access in rural districts. One of the most visible and meaningful strategies to emerge from this work is the rise of Community STEM Nights, which offer public, hands-on opportunities for students, families, and businesses to engage with computer science, technology, and career-connected learning.

We examine Community STEM Nights as a concrete outcome of the WFR research-practice partnership, highlighting how these events build local relevance, foster educator

leadership, and serve as sites for coproduced evidence use.

RESEARCH-PRACTICE PARTNERSHIPS

Research-practice partnerships are long-term collaborations between researchers and practitioners that focus on addressing persistent problems in education. Unlike traditional research models that treat practitioners as end-users of research findings, these partnerships emphasize codesign, shared decision-making, and ongoing knowledge production across institutional boundaries (Farrell et al. 2021; Henrick et al. 2016). By including educators, administrators, and researchers as equal contributors, research-practice partnerships aim to increase the usability, relevance, and equitable impact of educational research (Tseng 2024).

This approach is especially critical in rural contexts, where top-down mandates often fail to account for place-based challenges and assets. Rural educators operate under complex constraints ranging from staff shortages and geographic isolation to local industry dynamics and tight-knit community relationships (Crumb et al. 2023).

THE WORKFORCE READY 2030 PARTNERSHIP

Workforce Ready 2030 (WFR) is a Maine-based research-practice partnership designed to build the

capacity of rural educators to implement computer science-integrated instruction and to expand equitable access to computer science education across all grade levels, from pre-K through 12th grade. The partnership includes 14 school districts that represent the economic and geographic diversity of rural Maine. District teams are composed of classroom teachers, special educators, technology directors, and administrators who collaborate to integrate computer science into locally relevant curriculum (Kastelein et al. 2023).

Given Maine's locally governed education system—where districts maintain a high degree of autonomy—WFR leverages educator leadership and fosters collaboration across roles and regions. The partnership supports educators in designing and delivering computer science instruction within their classrooms and prepares district teams to offer professional learning to their peers in neighboring communities. These efforts are supported by core organizational partners including the Maine Mathematics and Science Alliance (MMSA), Educate Maine, and the Education Development Center (EDC), all of which contribute to aligning computer science education with regional workforce needs.

WFR operates as a multi-tiered research-practice partnership (Farrell et al. 2021), combining direct support for instructional innovation with broader infrastructure for district-level leadership development. One of the most important outcomes to emerge from the partnership has been the development of Community STEM Nights—public-facing events that reflect the RPP's emphasis on contextual relevance, collaboration, and sustained community engagement.



Mt. Ararat Principal, Chris Hoffman Greets Community Members to Community STEM Night

A RURAL MODEL FOR ENGAGEMENT

STEM Nights offer an accessible entry point for families, businesses, and community members to learn about how computer science and emerging technologies are being taught in schools and how they relate to longtime Maine industries like farming, fishing, and forestry. These events are designed and led by WFR educators using insights from classroom practice, professional learning, and local partnerships.

At Mt. Ararat Middle School, in Topsham, Maine, over 400 attendees participated in the district's first STEM Night in January 2025. The event featured student-led robotics demonstrations, digital art showcases, a virtual firefighting simulator, and a crowd-favorite performance by the Woodside One Wheelers, who used sensors to demonstrate the physics of unicycling. Local organizations, including Bath Iron Works, Ocean Renewable Power Company, and Maine Maritime Museum, also participated, showcasing real-world computer science applications.

Educators from the school district collaborated across grade levels and subject areas to make the event a success. "Having not done this before, we weren't sure what to expect for community attendance," said Principal Chris Hoffman. "But the response was incredible."

At Ellsworth Elementary-Middle School, in Ellsworth, Maine, a K–8 Family STEM Night, families participated in math games, coding challenges, and robotics stations while filling out STEM Passports to earn prizes. Local business tables included representatives from Jackson Laboratories, Katahdin Salmon, and Hancock County Technical Center. Donated food and student volunteers added to the celebratory atmosphere.

Organized by a team of educators, many of whom were part of WFR, the Ellsworth event was grounded in local leadership and community investment. "At first, I thought it would be great if we had 20 families join us," said Katie Hollenback, Ellsworth's instructional technology director. "As of yesterday, we had 90 families registered."

COPRODUCED EVENTS, LOCAL IMPACT

While Community STEM Nights are informal in format, they reflect the foundational principles of research-practice partnerships, including the collaborative use of data, responsiveness to local needs, and alignment with educational goals codeveloped by educators and researchers. Educators draw on their experience implementing computer science-integrated lessons and participating in professional learning to design interactive events that resonate with their communities. Many of the featured activities, like robotics demonstrations, VR simulations, and demonstrations of applied technologies, are selected and adapted based on prior experience and reflection.

Across participating districts, early reports suggest that these events are contributing to increased awareness of and support for computer science education. Educators have noted growing interest in computer science among students and families, stronger relationships with local businesses, and increased visibility of the work taking place in classrooms. Several districts have also begun to use data from event participation, such as attendance records and informal feedback to strengthen funding proposals and to guide ongoing planning.

For many rural residents, these events provide a unique opportunity to engage with emerging technologies that are otherwise limited in their daily lives. In communities where access to broadband and digital tools may be uneven, Community STEM Nights create inclusive spaces for families and community members to explore how computer science connects to local industries and everyday experiences. These gatherings also serve to reinforce



A Youth Attendee of the Mt. Ararat Community STEM Night Practices Fire Safety with a Simulation Tool

the broader goals of the WFR partnership by fostering stronger connections among schools, educators, and industry partners.

Community STEM Nights offer a practical example of how educator-led initiatives, supported through sustained research-practice partnerships, can help address persistent challenges in rural education. These events function as sites of collaborative learning and mutual visibility, where schools and community members come together around shared interests in technology, workforce readiness, and student opportunity.

The alignment between computer science instruction in the classroom and the hands-on, community-focused design of STEM Nights illustrates the value of coproduced strategies. By drawing on insights from their own practice and using existing partnerships, educators are able to implement events that are both responsive and meaningful to their communities.

Moreover, the development and execution of STEM Nights demonstrate how informal community engagement activities can complement

formal instructional reform efforts. Educators use these events not only to share their work, but also to gather input, foster community trust, and make connections that support the long-term sustainability of computer science initiatives.

CONCLUSION

The success of STEM Nights in Mt. Ararat, Ellsworth, and other WFR partner districts illustrates how rural schools can drive equitable, locally meaningful computer science education reform. Using the structures and relationships of research-practice partnerships, these events transform community engagement into collaborative learning, making it clear that in rural Maine, the future of technology is not just being taught, but being built together.

ACKNOWLEDGMENTS

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NOTES

- 1 "Most Rural States in the U.S. 2025." <https://worldpopulationreview.com/state-rankings/most-rural-states>

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