

The background is a dark blue field filled with a complex network of glowing, light blue lines and spheres. The lines are thin and curved, creating a sense of movement and interconnectedness. Several larger, semi-transparent blue spheres are scattered throughout, some appearing as nodes where lines intersect. The overall effect is reminiscent of a quantum field or a neural network, with a bright, multi-pointed starburst of light on the right side.

ADVANCING K-12 QUANTUM EDUCATION

A BLUEPRINT FOR
STATE LEADERS

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To my fellow Coloradans,

The Blueprint for Advancing K-12 Quantum Information Technology marks a critical step in building pathways into tomorrow's technology workforce for all Colorado students.

Colorado has long been a leader in Science, Technology, Engineering, and Math education. Recently, our state has doubled down on the emerging space of Quantum Information Science & Technology (QIST), which is poised to reshape critical sectors of the economy. My administration was proud to support an investment of \$75M into the Elevate Quantum technology hub in 2024; these resources, alongside over \$40M in federal grant funds, have cemented Colorado as the epicenter of the national QIST ecosystem.

Growth in the quantum industry will create new job openings for high-paying, skilled roles, most of which will offer highly competitive salaries and require a bachelor's degree or less. These opportunities could be life-changing for many Colorado families, but only if they are equipped with the requisite skills and education to pursue them.

To ensure that Colorado workers can access these valuable opportunities, we need to start laying the groundwork early. I have made it a priority to ensure that students in Colorado learn about QIST starting in K-12, ensuring they are aware of this exciting field and can pursue emerging career opportunities therein.

This work is about more than just meeting future industry needs. It's about ensuring that Colorado families are reaping the benefits of our state's economic growth. And it's about ensuring that all Colorado students, whether they're working toward an industry certification or a Ph.D., have the opportunities and resources they need to succeed.

Together, we can lay a strong foundation for tomorrow's workforce.

Sincerely,



Jared Polis
Governor
State of Colorado

"Colorado has the unique opportunity to be at the forefront of the quantum revolution and to realize this future, we must equip our students with the knowledge, skills, and innovation to lead the way. By prioritizing cutting-edge education in quantum science and technology, we can ensure that the next generation is not only prepared for the jobs of tomorrow **but is also empowered to shape the quantum landscape of the future.**"

Dr. Angie Paccione Executive Director of the
Colorado Department of Higher Education

"Graduating prepared for success after high school means **providing Colorado students with career-ready learning** experiences while they earn their diplomas. Exploring QIT opens up an exciting new pathway for our students, educators, and families."

Susana Córdova Colorado Commissioner of
Education

EXECUTIVE SUMMARY

Quantum information science and technology (QIST) is a rapidly evolving technology field that is poised to reshape the global economy. Colorado and the Mountain West region overall have emerged as the national epicenter of the QIST industry, as home to more quantum organizations, companies, and jobs than anywhere else in the country. The QIST workforce will grow rapidly in the coming years, with projected 18% year-over-year job growth, creating valuable job opportunities for Colorado workers.



PHOTO: Chalkbeat, "Modern Career and Technical Education is for everyone." (Oct. 2023)

Establishing a robust and diverse QIST workforce requires laying the groundwork in K-12. Teaching QIST concepts and competencies as part of a well-rounded science, technology, engineering, and math (STEM) curriculum will ensure that all Colorado students are familiar with QIST and understand its significance in the broader economy. Upon high school graduation, our vision is that Colorado students will be prepared to pursue any of the varied career opportunities in QIST, from entry-level roles to those requiring more advanced education and training, equipped with the knowledge and skills to succeed.

State leaders have a crucial role in advancing a shared vision for K-12 quantum education and ensuring all students in Colorado, especially those in rural areas, have access to QIST instruction and opportunities. Although districts have autonomy over curricular decisions, state leaders can promote K-12 QIST education statewide by:

- ⇒ **Building awareness and demand** for QIST education among students, educators, and local leaders by introducing basic QIST concepts, highlighting its value and relevance in the future economy, and spotlighting how teachers are bringing QIST into the classroom.
- ⇒ **Supporting high-quality instruction** by creating opportunities for K-12 teachers to gain hands-on experience in QIST industries and scaling professional learning opportunities and supports.
- ⇒ **Activating district levers to adoption** by promoting how districts can leverage existing state-supported programs to deliver QIST instruction and providing guidance for districts to develop their own QIST opportunities and programming.

This blueprint outlines the specific ways in which state leaders can pursue these objectives and promote QIST education statewide, including building on work already in progress. These actions represent a critical step in ensuring that all Colorado students and families are included in tomorrow's workforce.

INTRODUCTION

The Future of Quantum Information Science and Technology

QIST is a rapidly growing technology area with the potential to unlock trillions in new revenue and revolutionize the economy. QIST leverages new methods for processing, storing, and transmitting information, enabling us to increase computing power exponentially and solve complex problems much faster than traditional computers. As it evolves, this technology is projected to transform sectors such as medicine, finance, engineering, and cyber security.

In the last decade, there has been significant federal investment in QIST. In 2018, President Donald Trump signed the National Quantum Initiative Act “to accelerate quantum research and development for the national security of the United States” by strengthening federally supported QIST programs, centers, and consortia¹. This landmark legislation catalyzed efforts to grow the QIST industry and workforce, including establishing the Quantum Economic Development Consortium (QED-C), a sector-wide consortium of government, academic, and industry stakeholders². This federal commitment was further cemented by the Biden Administration with the passage of the bipartisan CHIPS and Science Act of 2022³, which authorized \$10 billion to invest in regional innovation and technology hubs – including the Elevate Quantum tech hub.

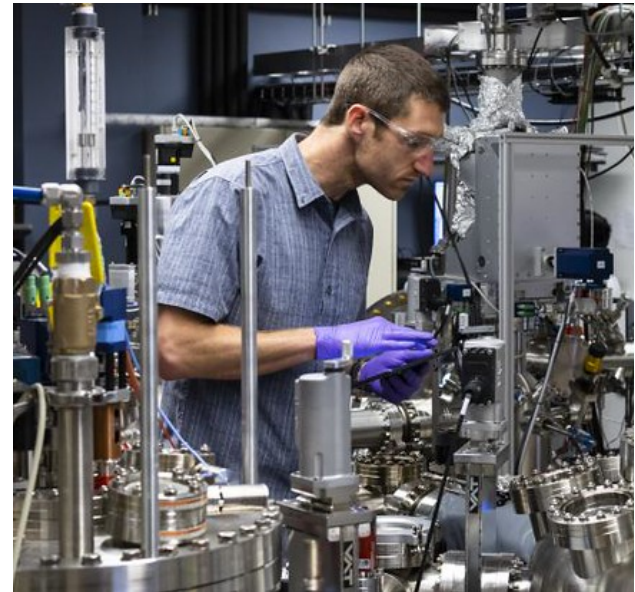


PHOTO: Oak Ridge National Laboratory, “Researchers advance topological superconductors for quantum computing.” (June 2024)

QIST in the Mountain West

As national efforts to advance QIST were taking shape, Colorado had already established itself as a national leader in quantum. Since 2000, four Colorado scientists have earned Nobel Prizes for groundbreaking work in quantum science. The Mountain West region is currently home to more quantum companies and jobs than anywhere else in the country⁴. There are five key segments of the QIST market, each with its own relative maturity and density in the region⁵:

- **Quantum sensors**

- Quantum networking and communication
- Quantum computing hardware
- Quantum algorithms and applications
- Enabling technologies

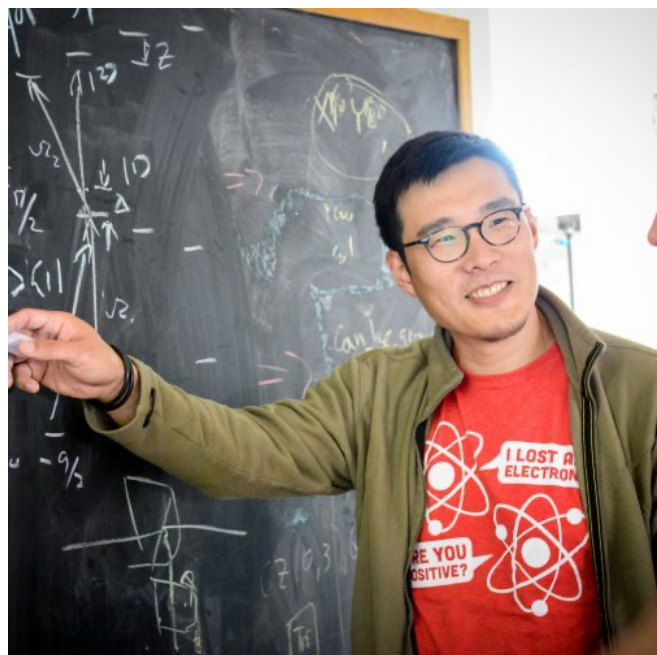
In 2024, Elevate Quantum, a Colorado-based consortium of 116 QIST organizations, was awarded a federal Tech Hub designation by the U.S. Department of Commerce Economic Development Administration⁶. With this designation, Elevate Quantum will receive \$40.5 million in federal funding, to which Colorado Governor Jared Polis has pledged to supplement through an additional state investment of \$74 million⁷. Through this effort, Colorado and the Mountain West aim to launch over 50 new quantum companies, add over 10,000 jobs to the regional economy, and attract close to \$2 billion in capital investment. In the coming years, this group will lead the way in securing the region's position as the global epicenter for QIST and enhance U.S. economic and national security.

Building the QIST Workforce

Growth in the QIST industry promises to transform the STEM workforce in the coming years. While most current QIST job openings are hardware-centric, demand is growing for professionals with versatile skills that bridge various areas of quantum technology. QIST jobs offer attractive salaries (averaging \$124,000 annually⁸), and many require less than a bachelor's degree (76%⁹) and non-quantum skills (80%¹⁰).

QIST industry experts anticipate an upcoming shift where the scalability of quantum software will catalyze long-term industry adoption, with anticipated 18% year-over-year growth in the QIST workforce. The Colorado CUBit Initiative has developed a four-part framework capturing the types of roles that will be needed to support the QIST industry, which include⁵:

- **Quantum experts:** Leaders in quantum research and development, with advanced degrees in QIST and related disciplines.



PHOTOL Elevate Quantum (October 2024)

- **Quantum proficient:** Industry leaders and skilled graduates employed in STEM companies.
- **Quantum conversant:** Professionals do not specialize in QIST but may integrate QIST-related content into their work.
- **Quantum aware:** Students, educators, and members of the public, who are aware of QIST concepts and can engage with a QIST economy.

Supporting a robust QIST economy means ensuring that **all people** are at least quantum aware, with access and resources to pursue further QIST skill-building. **To get there, leaders must look to earlier in the education-to-career continuum and begin laying the groundwork in K-12.**

A Growing Focus on K-12

National leaders recognize the need for K-12 QIST education. In 2020, the White House Office of Science and Technology Policy and National Science Foundation launched the National Q-12 Partnership¹¹, a consortium that works to expand access to K-12 quantum learning tools, including freely available instructional resources and frameworks, and



inspire the next generation of quantum leaders. The continued need for K-12 education was underscored in a 2022 report from the National Science and Technology Council Subcommittee on Quantum Information Science¹², which states:

To encourage growth in this base of domestic talent, it is aspirational that all learners should be empowered to see a place for themselves in the quantum-related careers roster. This requires that learners are provided exposure to QIST via accessible outreach and educational opportunities. These can be during regular school and business activities, and also in informal learning venues such as museums, movies, games, and other media. The goal is that they understand what QIST careers exist and what skills are needed. In this way, K-12 education and outreach can play a pivotal role in building a diverse future QIST workforce.

There are a growing number of national initiatives that provide dedicated QIST resources and training for K-12 students and teachers, including the Sandia National Laboratories QCaMP program¹³ and Qubit by Qubit¹⁴. **While efforts such as these play a critical role in advancing this space, state leaders have a crucial role to play in increasing access to K-12 QIST education at scale.**

A Vision for K-12 QIST

Colorado has made notable progress in advancing K-12 STEM education and establishing robust pathways into the workforce. State leaders have championed key policies to “erase the arbitrary boundaries between high school, college, and the world of work and open the opportunity for all young adults to move along a path toward a postsecondary credential and preparation for a career.”¹⁵

Colorado’s Vision for K-12 QIST Education

Every Colorado student will have the opportunity to develop a strong interest in quantum through exposure to real-world applications, authentic learning experiences, and an appreciation for how QIST can improve people’s lives. They will graduate with the foundational skills and knowledge needed to enter quantum careers or postsecondary opportunities.

If successful, our efforts will help cement Colorado as a global leader in the QIST industry, supported by an inclusive, diverse, and knowledgeable workforce with broad access to quantum education and career opportunities.

Despite the region’s strength in STEM, educational opportunities specific to QIST are still largely restricted to advanced postsecondary degree programs. There are a few innovative districts that have partnered with postsecondary institutions or nongovernmental initiatives to pilot QIST programs with high schoolers, but these efforts are targeted and limited in scope. State leaders must think intentionally about how to drive adoption of QIST education at scale, and specifically ensure that students in rural areas also have access to QIST opportunities.

As part of Governor Jared Polis’ commitment to advancing QIST in Colorado, the administration is prioritizing expanding access to QIST education in K-12. **The vision for K-12 QIST education, developed in partnership with state partners, anchors on ensuring students graduate from high school quantum-aware and ready to enter the QIST workforce.**

To achieve this vision, Colorado leaders must work together to meet the needs of multiple constituency groups across the K-12 ecosystem. Leaders from the Colorado Department of

Education, Colorado Community College System, and Colorado Department of Labor and Employment, in partnership with the Governor's office, have developed a **shared blueprint** for advancing K-12 QIST education in Colorado.

This document outlines a three-part strategy for state leaders to support the adoption of QIST education at scale, driving outcomes aligned to this vision.

Within each of these areas, this document identifies key actions for state leaders:

- **NOW**, which leverages available programs and resources.
Projected horizon to impact: end of 2025.
- **NEXT**, which will drive implementation at scale.
Projected horizon to impact: end of 2026.
- **LONG-TERM**, which will cement Colorado's commitment to K-12 QIST education for all students moving forward.
Projected horizon to impact: end of 2030.

Our Logic Model to Accomplish this Vision

If state leaders...

...that will result in....

...which will achieve:

build **awareness and demand** for QIST opportunities and programming among K-12 students, educators and communities

more **educators and students** who know about QIST and are engaging in QIST programming

Students achieving quantum awareness by high school and graduating ready to enter the QIST workforce

support **high quality instruction** through high-impact professional learning opportunities and resources

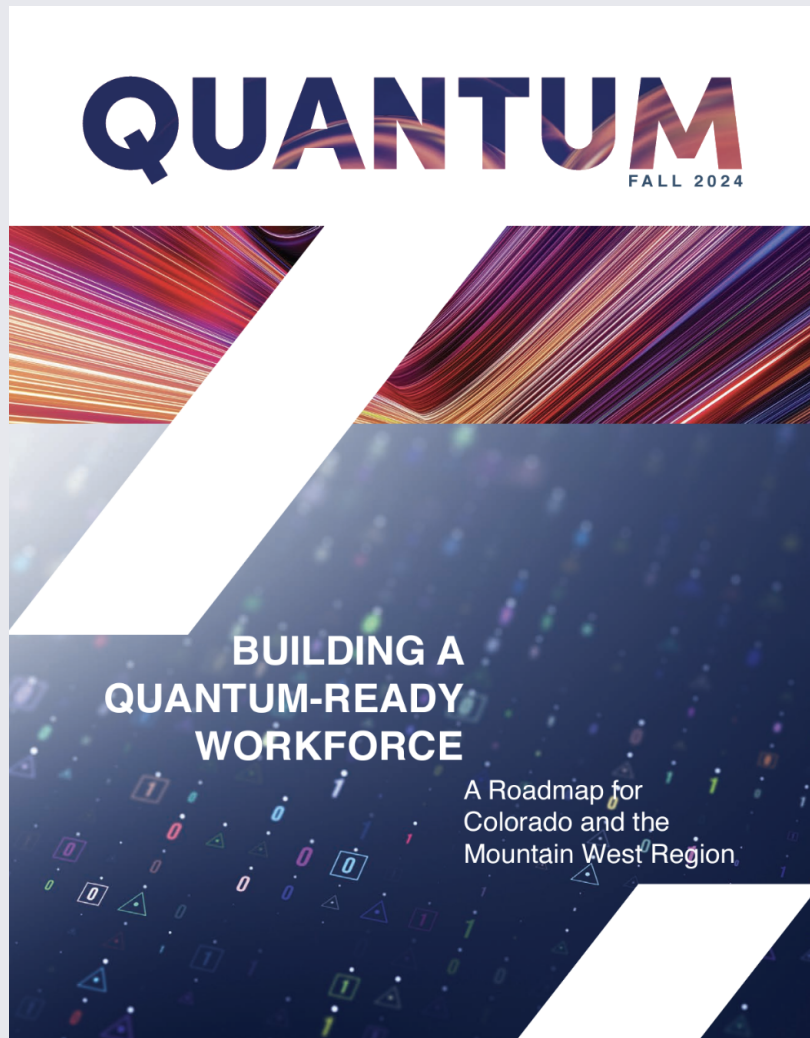
more **educators** who are equipped and motivated to deliver QIST in the classroom

Teachers integrating QIST in STEM instruction for all students and highlight opportunities in the QIST industry

activate district **levers to adoption** that use existing state initiatives to deliver QIST content and create student opportunities

More **districts** that are incorporating QIST in their academic and programming offerings

Districts supporting pathways into QIST and recognizing it as a key priority for student success and long-term outcomes



Bridging Gaps from K-12 to the Workforce

Governor Jared Polis’s administration is prioritizing building robust pathways from education into the QIST workforce. Alongside the K-12-specific strategies documented here, the Office of Economic Development and International Trade is supporting the Colorado CUBit Initiative in developing a QIST workforce roadmap⁵. **These two documents are complementary, and together, advance a cohesive vision for opportunities, resources, and supports that must be in place to guide students interested in QIST from K-12 through postsecondary and into the workforce.**

1. Building Awareness and Demand

Goal: Increase the number of students achieving quantum awareness in high school and graduating ready to enter the QIST workforce.

NOW: Pilot an online resource for QIST resources, and opportunities.

Currently, users must search multiple sources for information on what Colorado is doing to promote QIST in K-12. Launching a webpage dedicated to K-12 QIST with available QIST-related resources, programs, and opportunities will centralize this information, streamline access for teachers, district leaders, and other state partners, and establish a springboard for future efforts.

- **Key partners:** Colorado Department of Education, with support and input from the Colorado Department of Labor and Employment, Colorado Community College System, Elevate Quantum Workforce Collaborative, and the Governor's Office
- **Goal:** By the end of 2025, users representing at least 25 districts will download resources from the website.

NEXT: Leverage educator networks to drive engagement in K-12 QIST.

While some teachers are enthusiastic adopters of QIST instruction, others may not see the need or value for teaching QIST in K-12. To help bring this message to Colorado educators via trusted messengers, we will launch an outreach effort through established educator networks, using peer-to-peer storytelling to highlight how real teachers bring QIST into the classroom.

- **Key partners:** Colorado Department of Education, Elevate Quantum Workforce Collaborative, existing professional networks
- **Goal:** By the end of 2026, 300 educators will attend a QIST-related event via a partner network.

SPOTLIGHT

The Colorado STEM Ecosystem¹⁶, which is part of the National STEM Ecosystem initiative, seeks to foster peer-to-peer collaboration by connecting interested educators in dedicated communities of practice around specific STEM topics. Participation is voluntary and open to all CO educators.

LONG-TERM: Integrate QIST web content with statewide efforts to promote career pathways.

The strategies outlined in this document do not exist in a vacuum, but as part of a statewide push to promote career pathways into high-growth technology fields, including QIST, aerospace, engineering, AI, and more. As QIST gains traction in K-12, state leaders should seek to contextualize these opportunities in the variety of career pathways available to students in STEM. This includes embedding QIST content in existing career navigation platforms, such as My Colorado Journey¹⁷, and promoting the inclusion of QIST in future efforts to promote career development opportunities for students and communities, such as through the Opportunity Next¹⁸ grant. Prioritizing the inclusion of QIST in these promotion efforts will ensure that students are not only aware of QIST but see it as a path for their future.

2. Supporting High-Quality Instruction

Goal: Increase the number of teachers integrating QIST into their regular STEM instruction for all students.

NOW: Expand teacher externship opportunities in QIST.

Due to the nascency of the quantum industry, teachers interested in QIST have limited opportunities to learn about its workforce applications or access supports to bring that knowledge into the classroom. Teacher externships provide a pathway for teachers to learn about the burgeoning QIST industry and build the knowledge and skills they need to teach QIST. State leaders should consider how to expand these opportunities with QIST industry partners and establish program components that would help participating teachers share their insights and experience with other educators.

- **Key Partners:** Colorado Department of Education, the Colorado Department of Labor and Employment, Elevate Quantum Workforce Collaborative
- **Target:** By the end of 2025, at least twenty teachers will have completed QIST-related externships, representing at least ten total districts, at least two of which will be identified as rural.

SPOTLIGHT

As part of Colorado's teacher externship program, operated by the Colorado Department of Labor and Employment (CDLE)¹⁹, participating K-12 teachers completed externships with leading QIST companies while participating in QCaMP¹³, a QIST professional learning program offered through Sandia National Laboratories, to help them better translate their experience into the classroom.

NEXT: Launch interdisciplinary quantum professional learning opportunities for K-12 educators.

To reach the broader population of teachers who may benefit from QIST PL, but may not volunteer for a full QIST externship, the Colorado Department of Education can consider rolling out structured QIST PL opportunities that teachers can use to meet state PL requirements. By creating asynchronous PL resources aligned to these requirements, the Colorado Department of Education can ensure that all teachers around the state have access and incentive to participate in QIST PL. Leaders can also explore opportunities for synchronous support, such as a teacher fellowship for QIST.

- **Key Partners:** Colorado Department of Education, Elevate Quantum Workforce Collaborative

- **Target:** By the end of 2026, at least 15% of high school science and math teachers in Colorado will have engaged in a QIST PL opportunity.

LONG-TERM: Embed key QIST concepts and content in K-12 state learning standards.

Although districts have oversight over curriculum and instruction, the state is responsible for shaping the content and skills that are taught in K-12 schools through learning standards. Updating standards to include key QIST concepts and competencies requires extensive public engagement and sustained commitment from quantum leaders, as well as grassroots support from educators and communities. While this strategy involves a longer horizon to impact, embedding QIST in K-12 state standards ensures that students in every district have access to high-quality QIST instruction and cementing the support and resources teachers need to deliver that instruction.

3. Activating District Levers to Adoption

Goal: Increase the number of districts prioritizing QIST as a key priority for student success and long-term outcomes.

NOW: Integrate QIST skills and content into state CTE programs

The Colorado Community College System allocates federal career and technical education (CTE) funds to districts and approves CTE programming and pathways²⁰. By integrating QIST concepts and competencies into new or existing CTE pathways, state leaders can enable districts to leverage federal funds to provide QIST opportunities, establish connections with industry partners, and open doors for students across Colorado to explore the variety of opportunities within the QIST workforce.

- **Key Partners:** Colorado Department of Education, Colorado Community College System, Elevate Quantum Workforce Collaborative
- **Target:** By the end of 2025, at least 10,000 students across Colorado will participate in any CTE course that aligns to a QIST CTE skills and competencies framework.

SPOTLIGHT

The National Q-12 Education Partnership¹¹, an NSF-supported initiative to promote QIST in K-12, offers free online frameworks for mapping K-12 skills and competencies in math, physics, computer science, and chemistry. These resources, while not state-specific, can serve as a starting point to develop a Colorado-specific QIST K-12

NEXT: Promote a statewide framework of industry-aligned K-12 QIST skills and competencies.

Allowing districts to tailor QIST programming to their specific context and community is critical to success; state leaders can support this diversification, while also ensuring they are delivering high-quality and industry-aligned content, by developing a statewide framework for K-12 QIST skills and competencies for district use. Moving forward, this resource can inform future efforts to connect QIST education and workforce pathways and maintain alignment to evolving industry needs.

- **Key Partners:** Colorado Department of Education, Colorado Community College System, the Colorado Department of Labor and Employment, Elevate Quantum Workforce Collaborative
- **Target:** By the end of 2026, state leaders will establish a QIST K-12 framework cosigned by Elevate Quantum members and available for district use and adoption.

LONG-TERM: Enable cross-agency coordination on QIST K-12 education

As this space continues to evolve, so will the needs of students, employers, and districts. To maintain support for this effort and maintain strategic clarity, state agencies including CDE, CDLE, CCCS will need to work together and with other key partners, such as EQWC, to align priorities, collaborate effectively, and streamline messaging to shared stakeholder groups. Building forums for state leaders to come together around shared K-12 QIST goals is essential to drive implementation of these efforts and lay the groundwork for sustainable cross-agency governance in the future.

SYSTEMIC ENABLERS

The strategies outlined above outline the levers available to state leaders to promote and scale QIST in K-12. To achieve long-term impact, however, state leaders must also consider the system-wide conditions and supports needed to sustain and cement this work moving forward. There are three key areas district leaders must address as they pursue implementation of this blueprint:

DATA Colorado's vision for K-12 QIST education is based on students' entry into the QIST workforce. To assess whether the strategies outlined in this document are moving the needle on that goal, state leaders need data that reflects students' journeys through K-12, higher education, and the workforce. With individual-level longitudinal education and employment outcomes data, state leaders can better understand what is working, identify gaps, and ensure their efforts are effectively connecting Colorado students to QIST jobs.

There are upstream considerations that state leaders must address to ensure this information is being collected, including ongoing efforts to develop Colorado's statewide longitudinal data system and federal rules that shape workforce data collections. In the near-term, they should explore how to use existing data structures as proxy measures where QIST-specific data does not exist (e.g., STEM career categorizations) while understanding the processes and requirements to capture more granular data on QIST in the future.

SUSTAINABLE GOVERNANCE This blueprint underscores that advancing K-12 QIST will require cooperation between state agencies, industry groups, and local leaders. The strategies outlined in this document provide a starting point for these stakeholders to come together around shared objectives.

INDUSTRY PARTNERS QIST is a rapidly evolving sector. To ensure that K-12 QIST education is keeping up with technological innovation and students are getting the best preparation to enter the workforce, state leaders must work closely with QIST industry partners. Moreover, many of the strategies highlighted in this blueprint, including teacher externships and CTE programming, require having local industry

partners who are willing to host teachers or students for work-based learning opportunities. Without them, there is no K-12 QIST education.

State leaders should consider how to develop ongoing partnerships with industry partners that secure their support and leverage their support for informing K-12 QIST opportunities. Partnering with industry collaboratives or professional associations ensures access to a wide range of industry partners. State leaders should also explore incentives, including tax credits, that recognize and reward industry partners for supporting this critical work.

BUILDING MOMENTUM

The actions and strategies outlined above are essential to advance state support for K-12 QIST education, but they are not happening in a vacuum. There is significant interest and activity in the QIST space, with multiple partners and ongoing efforts seeking to expand the sector and strengthen industry-aligned pathways from education into the workforce. Proactively collaborating with these partners will unlock new opportunities to support students and educators and maximize the impact of strategies outlined in this document, while also building cohesion and transparency across the field.

Below, we have highlighted some of the notable initiatives and organizations with which to consider collaboration. While not all are explicitly QIST-focused, there are opportunities for strategic alignment around foundational skills and competencies, as well as overlapping industry partners and connections.

SUPPORTING LOCAL INNOVATION State leaders should look to leading districts to pilot new ways to bring QIST into K-12; they can support this work by highlighting available funding opportunities or mechanisms (e.g., state grants) to further grow this work, and by elevating stories of impact to broader statewide audiences. Some notable examples of district-led innovation shaping the field currently include:

- ⇒ **Homegrown Pathways**²¹ operates an AmeriCorps program focused on rural districts, which will empower recent graduates to deliver STEM extracurricular programming with support from regional industry partners.

- ⇒ **Colorado Aerolab**²² delivers hands-on out-of-school learning experiences for students and families across Colorado, with a growing focus on STEM and computer science.
- ⇒ **Elevate AI**²³ partners with leading districts to pilot innovative professional learning supports and curriculum that will build student and educators' AI literacy and skills.
- ⇒ **QCaMP**¹³ operates programs where high school students and teachers can learn QIST fundamentals and gain hands-on experience, in partnership with Sandia National Laboratories.
- ⇒ **QubitxQubit**¹⁴ is an EdTech venture that has partnered with schools and districts to offer QIST coursework and professional development opportunities.

MAPPING COHESIVE EDUCATION-TO-WORKFORCE PATHWAYS One of the priority strategies profiled in this blueprint is to build a statewide framework of K-12 QIST skills and competencies. To maximize the value of this resource, state leaders should consider how to connect it to parallel efforts to map QIST postsecondary and workforce pathways. Additionally, many of the skills and competencies required for QIST can also prepare students for careers in other advanced STEM fields, such as aerospace, cybersecurity, and artificial intelligence. Highlighting these overlaps will not only strengthen the value proposition for QIST, but also build clarity among district partners. Relevant efforts here include:

- ⇒ **The Colorado CUBit Initiative**²⁴ brings together university research expertise and industry partners to advance QIST technology and build a strong foundation for the region, including creating a comprehensive roadmap for QIST workforce development efforts.
- ⇒ **Colorado Education Initiative**²⁵ is partnering with the AI Education Project and other state partners to create opportunities to foster AI literacy statewide, including releasing a roadmap for integrating AI into teaching and learning in Colorado.

ENGAGING IN WORKFORCE DEVELOPMENT EFFORTS While focused on K-12, this blueprint fits into the broader education-to-workforce ecosystem in Colorado and the Mountain West. To ensure it remains embedded in broader efforts to grow the QIST sector, K-12 state leaders must remain engaged in these ongoing conversations. This will not only ensure that K-12 QIST education offerings are aligned to evolving industry needs, but also highlight where state-led strategies to advance K-12 QIST intersect with industry-funded

workforce development efforts and opportunities to leverage private resources. Some notable groups that state leaders should prioritize include:

- ⇒ **Elevate Quantum Workforce Collaborative⁴**, established by the Elevate Quantum Tech Hub, is a stakeholder network that brings together QIST leaders and experts from across the region around shared goals of building an inclusive and robust QIST workforce.
- ⇒ **Quantum Community Coalition²⁶**, led by CU Boulder, brings together stakeholders from higher education and industry to explore how Colorado can leverage its expertise and industry to drive QIST growth in the region.
- ⇒ **Colorado-Wyoming Climate Resilience Engine²⁷** is a federally funded initiative aiming to drive innovation in the climate technology sector across the region and support development of climate resilient technologies.

CONCLUSION

The QIST field is still nascent, but in just a few short years, it will revolutionize the workforce and industry landscape of Colorado. State leaders must take a proactive approach to ensure that Colorado is preparing students now for the jobs of the future. Doing so will not only ensure that Colorado's workforce can support future growth in this field, but also that Colorado students will be the ones to benefit from these opportunities.

The strategies and goals identified in this document together constitute how Colorado state leaders can work together to accelerate progress and catalyze innovation in this space. Ultimately, state leaders have a limited role in shaping what students are taught in K-12; but strategically leveraging state-supported initiatives and funding streams, while also building grassroots demand among key stakeholder groups, they can drive local delivery of high-quality QIST instruction.

As with all policy strategies, the ultimate value of this work lies in successful implementation. Guiding principles that will be essential to ensure the ultimate success of this work include:

- ⇒ **Establishing shared goals and routines to drive progress.** Collaborative strategic efforts too often fail because of divergent priorities and lack of shared accountability. Ensuring successful implementation requires that state leaders agree on shared and measurable targets aligned to their goals, codify their respective roles and

responsibilities, and establish the processes through which they can continue to collaborate and track progress towards their goals.

- ⇒ **Streamlining messaging to key stakeholder groups.** District leaders and educators are inundated with messaging about what they should be teaching and why. To effectively engage these audiences, state leaders should work to ensure they are delivering the same message across multiple channels and reinforcing their vision for K-12 QIST, as well as underscoring how this work connects to and reinforces other QIST-adjacent education efforts.
- ⇒ **Remaining nimble and responsive to emergent opportunities.** As the QIST sector continues to evolve, there may be new opportunities to integrate QIST in K-12 beyond the strategies outlined in this blueprint. State leaders should remain steadfast on pursuing their vision for K-12 QIST education, but flexible in their approach. Taking advantage of new opportunities for state-supported programming or industry partnerships will ensure that the K-12 QIST offerings remain dynamic and relevant to the broader QIST industry.

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- ¹⁹ [CDLE Teacher Externship Program](#)
- ²⁰ [Perkins Collaborative Resource Network: State Profile – Colorado](#)
- ²¹ [Homegrown Pathways](#)
- ²² [Colorado Aerolab](#)
- ²³ [Colorado’s ElevateAI Program Awarded Grant to Enhance AI Literacy and Transform Education and Workforce Development](#)
- ²⁴ [CUBit Quantum Initiative](#)
- ²⁵ [Colorado Education Initiative](#)
- ²⁶ [CU Boulder-convened Quantum Community Coalition unveils vision for Colorado’s ‘Quantum-Ready Workforce’](#)
- ²⁷ [NSF Engines: Colorado-Wyoming Climate Resiliency Engine](#)

