2025

ILLINOIS

COMPUTER SCIENCE
STATE STRATEGIC PLAN

The Illinois Strategic Plan for Computer Science Education for Students Kindergarten - 12th grade.

Authors and Leadership

This project is primarily planned, facilitated, and coordinated by:

ECEP ILLINOIS
Expanding Computing Education Pathways

Illinois Computer Science State Strategic Plan

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TABLE OF CONTENTS

Current Status

Recommendations

Link to Text Only Version (no graphics, for screenreaders)

LETTER TO THE GOVERNOR

OCTOBER 1, 2025
REPORT OF THE STRATEGIC CS PLAN FOR IL

To: Governor J.B. Pritzker
Juliana Stratton, Lieutenant Governor
Dr. Tony Sanders, IL State Superintendant

From : ECEP Illinois Team

Subject: Report on the Illinois Computer Science Strategic Plan

This document is a State Plan for how all Illinois K-12 schools can successfully and feasibly integrate the study of Computer Science (hereafter referenced as “CS”) and Artificial Intelligence (hereafter referenced as “AI”) into every Illinois K-12 student’s foundational learning.

This State Plan is written for both the residents of the state of Illinois and for Illinois educational policymakers. It is written in the shared belief that we all want what is best for every Illinois K-12 student, and within that shared belief - the understanding that the study of CS and AI are no longer “nice-to-haves,” but rather now have become as fundamental to student long-term success as every other subject these students already study.

This document is a culmination of the significant time and effort invested into its creation by many individuals and working groups. This set of individuals represents a wide range of voices: K-12 education, higher education, nonprofit organizations, and industry, to name a few. We are individuals who live in farming communities, large cities, and their suburbs - communities such as Alton, Champaign, Chicago, Galesburg, Lake Zurich, Peoria, Quincy, Rockford, and Troy are our hometowns. Many of us are parents or caregivers of current or graduated Illinois K-12 students.

We humbly but decisively submit this State Plan to our fellow Illinois residents in the spirit of partnership, and with the understanding that systemic change in K-12 education is both challenging and possible, especially when it is necessary. But we do not leave it there. Significantly, this State Plan lays out a strategy to make integration of CS and AI learning not only possible, but successful...statewide.

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GOALS & RECOMMENDATIONS HIGHLIGHTS

GOAL 1: PROVIDE SUSTAINABLE AND EQUITABLE FUNDING FOR COMPUTER SCIENCE IN ILLINOIS

1. Provide dedicated funding for rural and underserved Schools
2. Increase and Sustain Funding for Expanding Teacher Preparation and Professional Development
3. Strengthen K-12 Computer Science Infrastructure and Student Access
4. Establish a Permanent State-Level Leadership Position for CS Education

GOAL 2: STRENGTHEN TEACHER PREPARATION & TEACHER CAPACITY

5. Expand and Enhance Teacher Learning and Professional Development
6. Establish Robust and Flexible Credentialing and Certification Pathways
7. Ameliorate Regional Access Disparties for Professional Development and Teacher Education

GOAL 3: ADVANCE COMPUTER SCIENCE EDUCATION THROUGH K-12 PATHWAYS AND GRADUATION REQUIREMENTS

8. Establish Vertical Alignment of Computer Science Pathways
9. Integrate Computer Science into the Core Curriculum in Elementary Schools
10. Establish a High School Computer Science Graduation Requirement

GOAL 4: EXPAND AND STRENGTHEN COMPUTER SCIENCE OUTREACH IN ILLINOIS

11. Develop a Comprehensive Statewide Opportunity Map for CS Programs
12. Strengthen the Connection between In-School and Out-of-School CS Learning
13. Expand CS Outreach through Data-Driven Advocacy and Funding
14. Strengthen Educator Training and Credentialing for Out-of-School CS Instruction

GOAL 5: STRENGTHEN COMPUTER SCIENCE EDUCATION THROUGH RESEARCH AND DATA REPORTING IN ILLINOIS

15. Establish a Publicly Accessible Computer Science Education Data Portal
16. Develop a Research Agenda for Computer Science Teacher Preparation and Retention
17. Strengthen High School to Post-Secondary Computer Science Pathways

GOAL 6: PROVIDE GUIDANCE AND RECOMMENDATIONS ON AI TOOLS, PRACTICES AND POLICIES

18. Promote Statewide AI Literacy for All Students
19. Expand Professional Learning for Teachers and Leaders
20. Create Clear and Equitable Guidance on the Use of AI in Schools
21. Close the Emerging AI Equity Gap
22. Foster Innovation Through Research and Pilot Programs
23. Establish an Illinois AI in Education Task Force

ILLINOIS CASE FOR STRENGTHENING COMPUTER SCIENCE EDUCATION

A CALL TO ACTION

Consider that at this moment, as you read these words in this document, it is quite possible that some or all of what you are reading was written by a machine, and not a human.

This is a phenomenon that was not possible even five years ago. And yet... ten years ago, only a few people saw this coming.

Now consider that just thirteen years ago, social media had only begun to come online. Just eighteen years ago, the first iPhone was released. And twenty-five years ago, dial-up Internet access was still dominant, and terms like “web browser” and “cybersecurity” and “the cloud” and “self-driving cars” were primarily the stuff of fiction.

There is clear evidence here that new computing innovations are continuing to emerge into society with increasing speed and impact, even as we do not fully understand the impact these technologies will have on individuals, on our economy, in society.

Put differently: we now have reached an age where technologies are happening to us faster than we even know how to properly use them, how they are made, or why they are made.

Given this trend, we now call upon educational policymakers in Illinois K-12 education to act upon the moral imperative of ensuring each of our students develop a robust and deeply integrated understanding of how computing technologies are made, how to use them ethically and responsibly, how to successfully create new computing technologies, and ultimately how to leverage them all to benefit our economy, culture, and society.

Absent this, we can no longer say with certainty that our students in Illinois will leave our schools well-prepared for their future, let alone their “today.”

Consider as yet another example that we have already been provided with substantial evidence from the US Surgeon General in 2024 identifying the significant toll social media can and does take on the mental health of countless adolescents. In Illinois, these are the very same adolescents for whom we offer this State Plan.

WORK IS ALREADY HAPPENING TO ANSWER THIS CALL

We also acknowledge that our call to action is not new to the state of Illinois. For over a decade, many individuals, legislators, and organizations have championed throughout Illinois the vast economic potential of a homegrown talent pool coming out of our K-12 education system. That economic potential has not changed to this moment in time.

Today, a student who successfully completes just a single course in foundational computing can expect to earn an average increase in lifetime earnings of nearly 8%. For those students who go on to pursue

computing as a career, the earnings become much higher. Many of these jobs are offered virtually, allowing individuals to remain in their current Illinois hometowns - rural, suburban, urban, or otherwise - while working.

And to be certain: the emergence of AI has not replaced the need for computing professionals. The impact of AI on the job market in the tech sector is not the elimination of computing jobs, but rather a shift toward the specialization of these computing jobs. Today and well into the foreseeable future, these jobs increasingly depend on a professional's ability to leverage AI for efficiency and accuracy in their work.

Consider that Illinois residents have already invested through our state budget a billion dollars into a quantum computing research and development facility at the University of Illinois in Champaign-Urbana. This facility will need some of the brightest minds available to achieve its goals; consider the benefits to the Illinois economy if these individuals graduated from an Illinois high school. The economic potential for Illinois as a national and international leader in developing new technologies is already recognized, and would only be further amplified by putting homegrown talent to work here.

Already, a growing collection of schools and school districts in Illinois have taken bold and groundbreaking action to integrate high-quality CS and AI learning into their students' academic experience.

Consider that in 2016, the Chicago Public Schools (D299) became the first district of its size nationwide to implement a high school graduation requirement in CS. In many ways, the "CSforAll Movement" was born in the city of Chicago. In 2018, the relatively tiny neighboring district of Ridgewood High School (D234) launched its own "CSforAll" program, ensuring that every ninth grader who enters the school will take one full semester of dual-credit, dual-enrollment foundational CS. And, in 2025, approximately 320 miles southwest of Chicago, Marion Community Unit School District 2 (Marion CUSD2) became the first public K-12 district in Illinois to begin work on a fully integrated CS and AI curriculum, from Kindergarten to 12th grade, taking on this call to action fully and completely.

Significantly, for the past two school years, each of these districts (and several dozen other districts in Illinois) sought and received funding assistance for their respective programs through a first-ever $3M state-funded grant program for CS learning, approved and supported by our state legislature, and implemented by the Illinois State Board of Education. This grant program continues to provide funding for these and many other groundbreaking CS and AI learning initiatives throughout the state to this day.

Also significant: in March 2021, following a school year in which new computer-based virtual learning technology suddenly and unexpectedly became a necessity in schools statewide due to the COVID-19 pandemic, Illinois joined over two dozen other states in requiring by law that all school districts with a high school offer these students at least one course in foundational CS. That number of states has since grown to 32 (of which 12 have also implemented a statewide high school graduation requirement in foundational CS).

Alongside growing legislative support for statewide CS and AI learning, Illinois has reached a number of other noteworthy milestones in creating the infrastructure necessary to implement systemic change of this magnitude statewide. Since 2021, the Illinois State Board of Education implemented Illinois K-12

CS Learning Standards, the Learning Technology Center (LTC) launched its 3rd-annual statewide professional development week in K-12 CS Education to over 80 Illinois K-12 teachers and administrators, ISBE modernized its teacher endorsement exam in CS, a statewide chapter of the Computer Science Teachers' Association was created and launched, we now have a state university that offers a four-year degree concentrating in CS education, several public and private Illinois colleges and universities began providing nearby school districts with resources necessary to implement their own local programs, and a large and growing number of public-private partnerships launched to support local and statewide work in bringing CS and AI into the K-12 classroom. These are victories worth honoring in the growing statewide effort to prepare our students to become the computing innovators of today, tomorrow, and the future beyond.

WE STILL HAVE A LONG WAY TO GO

But for as much as Illinois K-12 education has moved forward in setting the stage for widescale integration of CS and AI learning across its 852 school districts, we still have a long way to go to reach that goal. While all high schools in Illinois are required by law to offer a foundational course in CS, only 60% in reality have been able to do so. Only approximately 7.4% of Illinois high school students actually completed a foundational course in CS last school year, lagging far behind high school students in our neighboring states. This number drops to 4.5% statewide without the Chicago Public Schools high school graduation requirement. The state has a significant shortage in endorsed CS teachers, and thus most districts are unable to hire an endorsed and well-qualified CS teacher. Rural Illinois is significantly outpaced in student access and in participation by suburban and urban Illinois. The teacher endorsement for computer science in Illinois only holds for grades 5-12, even as a growing body of research identifies CS and AI learning to be its most potent in the elementary grades. Several districts in Illinois struggle to offer reliable broadband Internet access to students and teachers in school, let alone CS or AI learning. We do not yet have a state-funded director of Computer Science education. Many students in Illinois do not have reliable access to a computer or iPad or Chromebook... at home, or at school. The list of challenges extends beyond these, and it is long.

WE CAN TAKE ON THESE CHALLENGES IN ILLINOIS, THOUGH

The challenges Illinois faces in integrating CS and AI learning into K-12 learning may seem big, but they are not insurmountable. They are also not unique to Illinois. To date, a dozen other states (including neighboring Indiana and nearby Nebraska) have already integrated CS into their core high school graduation requirements. Educational policymakers in these states have already recognized the local need, encountered many (if not more) of the challenges we currently face, and then took on each challenge, head-on. It is our time now to do the same and more for Illinois K-12 students.

Humbly and Respectfully Submitted,

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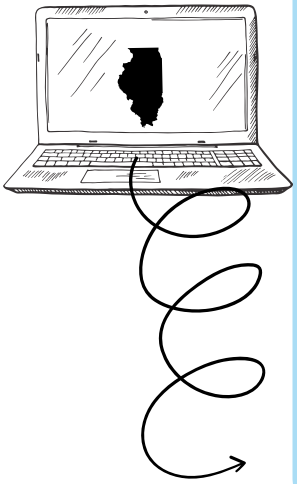


DEFINING COMPUTER SCIENCE

It is critical to note that at its core, “Computer Science” is a field of study that focuses heavily on creation. It is a creative endeavor to study new computational innovations (such as in studying how an artificial intelligence is made). It is also a creative endeavor to make new computational innovations.

Formally, for clarity and consistency we use the same definition of “Computer Science” as adopted by the Illinois State Board of Education and embedded into current School Code.

Computer science is the study of computers and algorithmic processes, including their principles, hardware and software designs, and impact on society. Computer science does not include the study of everyday uses of computers and computer applications, such as keyboarding or accessing the Internet. (Tucker, et. al, 2003)

ILLINOIS LEGISLATIVE HIGHLIGHTS

2013 **CSforAll initiatives begin** across the U.S., including Chicago, promoting the offering of CS instruction for all K-12.

2016 As part of the CSforAll initiative, **Chicago Public Schools implements a graduation requirement** that all students take one year of computer science coursework. The first class graduates under this requirement is in 2020. (Elahi, 2016)

2021 Public Act 101-0654, The Education and Workforce Equity Act, is signed into law, mandating an expansion of the state's CS education system. **Expansion includes a definition of CS, state CS standards, and high school districts are required to offer at least one CS course to all students** by the 2023-2024 school year.

2023 105 ILCS 5/2-3.199 establishes a new competitive grant program—the Computer Science Equity Grant—**which provides funding for K-12 computer science program development and professional learning** across the state.

2023 **Illinois joins the Expanding Computing Education Pathways (ECEP) Alliance**, an organization dedicated to increasing the number and diversity of students pursuing computing degrees.

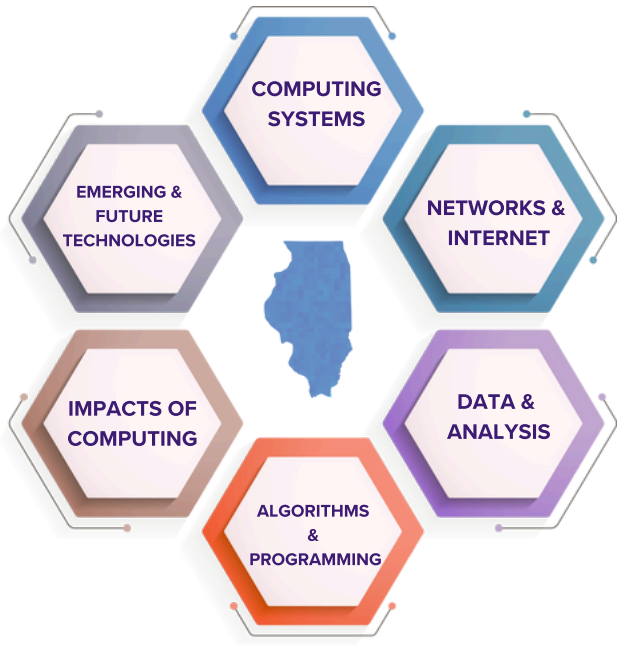
2024 **Work continues on the state CS plan** with additional input from stakeholders at the annual ECEP Illinois summit.

2025 Public Act 104-0399 **mandates ISBE to develop and publish statewide guidance on the use of Artificial Intelligence (AI)** in elementary and secondary education for school districts and educators by July 2026.

CURRENT
ILLINOIS COMPUTER SCIENCE STANDARDS

Illinois Computer Science Standards were adopted with the enactment of Public Act 101-0654, which required the Illinois State Board of Education to develop rigorous learning standards for computer science by December 1, 2021. These standards were developed by a stakeholder group of educators throughout Illinois and based on the Computer Science Teachers Association CS Standards.

Full Illinois CS Standards & Practices



COMPUTER SCIENCE PRACTICES

"The seven **core practices of computer science describe the behaviors and ways of thinking that computationally literate students use to fully engage in today's data-rich and interconnected world**. The practices naturally integrate with one another and contain language that intentionally overlaps to illuminate the connections among them. They are displayed in an order that suggests a process for developing computational artifacts. This process is cyclical and can follow many paths; in the framework, it begins with recognizing diverse users and valuing others' perspectives and ends with communicating the results to broad audiences. **"Unlike the core concepts, the practices are not delineated by grade bands. Rather, the practices use a narrative to describe how students should exhibit each practice with increasing sophistication** from kindergarten to Grade 12. In addition to describing the progression, these narratives also provide some examples of the interrelatedness of the practice statements and the ways in which these statements build upon one another."

- K-12 Computer Science Framework

CORE PRACTICES

- Fostering an Inclusive computing culture.
- Collaborating and computing.
- Recognizing and defining computational problems.
- Developing and using abstractions.
- Creating computational artifacts.
- Testing and refining computational artifacts.
- Communicating about computing.
- Analyzing the effects of advancements in computing on one's society, economy, and culture.
- Reflecting on and revising one's computational though processes and those of others.

ILLINOIS COMPUTER SCIENCE GOALS:

1: SECURE SUSTAINABLE & EQUITABLE FUNDING

2: STRENGTHEN TEACHER CAPACITY

3: ADVANCE EDUCATION PATHWAYS

4. EXPAND CS OUTREACH

5. SUPPORT RESEARCH TO STRENGTHEN CS

6. GUIDE AND SUPPORT AI PRACTICE & POLICY

GOAL # 1

PROVIDE SUSTAINABLE AND EQUITABLE FUNDING FOR COMPUTER SCIENCE IN ILLINOIS

The integration of computer science (CS) education into Illinois' K-12 system requires a sustainable and equitable funding strategy that ensures all students, regardless of their geographic location or socioeconomic background, have access to quality CS instruction. While recent efforts have expanded CS education, many schools, particularly those in rural and historically underserved communities, lack the necessary resources, infrastructure, and trained educators to implement robust CS programs. Without dedicated funding, schools face significant barriers to providing students with opportunities in computing, leading to disparities in participation and workforce preparedness.

To address these challenges, Illinois must implement a structured and long-term funding approach that prioritizes four key areas: increasing financial support for rural and underserved schools, expanding teacher preparation and professional development, strengthening K-12 CS infrastructure, and establishing dedicated leadership at the state level to coordinate and sustain these efforts. This policy brief outlines a six-year phased approach to funding these initiatives, ensuring that Illinois can build a strong, equitable, and lasting foundation for CS education statewide.

RECOMMENDATIONS

1. Provide dedicated funding for rural and underserved Schools
2. Increase and Sustain Funding for Expanding Teacher Preparation and Professional Development
3. Strengthen K-12 Computer Science Infrastructure and Student Access
4. Establish a Permanent State-Level Leadership Position for CS Educatior

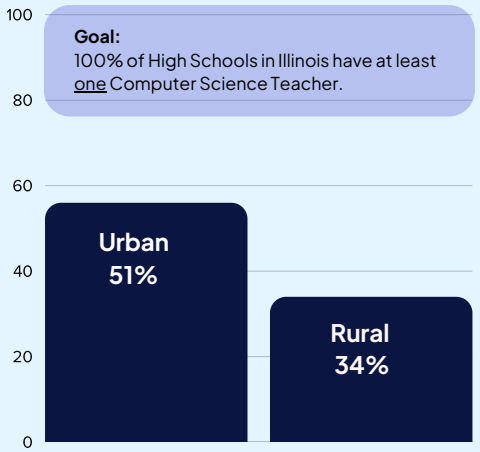
RECOMMENDATION 1:
PROVIDE DEDICATED FUNDING FOR RURAL AND UNDERSERVED SCHOOLS

Disparities in CS access between urban, suburban, and rural school districts remain a pressing concern, with data showing significant gaps in course offerings and teacher availability. For example, **only 34% of rural high schools in Illinois offer a foundational CS course**, compared to 51% in urban areas (Illinois State Board of Education, 2024). Rural schools often lack the infrastructure, staffing, and funding necessary to offer CS courses, creating systemic inequities that limit student opportunities. To address this, Illinois must allocate dedicated funding that supports the expansion of CS education in rural and historically underserved districts.

Over the first two years of implementation, **funding should be directed toward a needs assessment**, leveraging geographic data to identify specific schools and districts that lack access to CS courses, and qualified instructors. During this period, targeted grants should be distributed to support the purchase of necessary technology, provide teacher training, and fund initial program implementation. By the third year, the funding structure should shift toward long-term sustainability, ensuring that rural schools receive annual allocations rather than one-time grants. The goal is to prevent CS education from becoming an unfunded mandate, ensuring that all students, regardless of where they live, have access to meaningful computing instruction.

To sustain this initiative, **Illinois should develop a funding model that is based on district needs** rather than per-pupil funding, allowing smaller and under-resourced districts to receive adequate financial support. By year six, all rural and underserved schools in Illinois should have the infrastructure and instructional capacity to offer foundational CS courses, supported by ongoing state investments.

CS TEACHER ACCESS



Source: Illinois State Board of Education, 2024

STRATEGIC PLAN

Years 1 & 2:

- Needs Assessment
- Targeted Grants
- Teacher Training

Years 3 & Beyond:

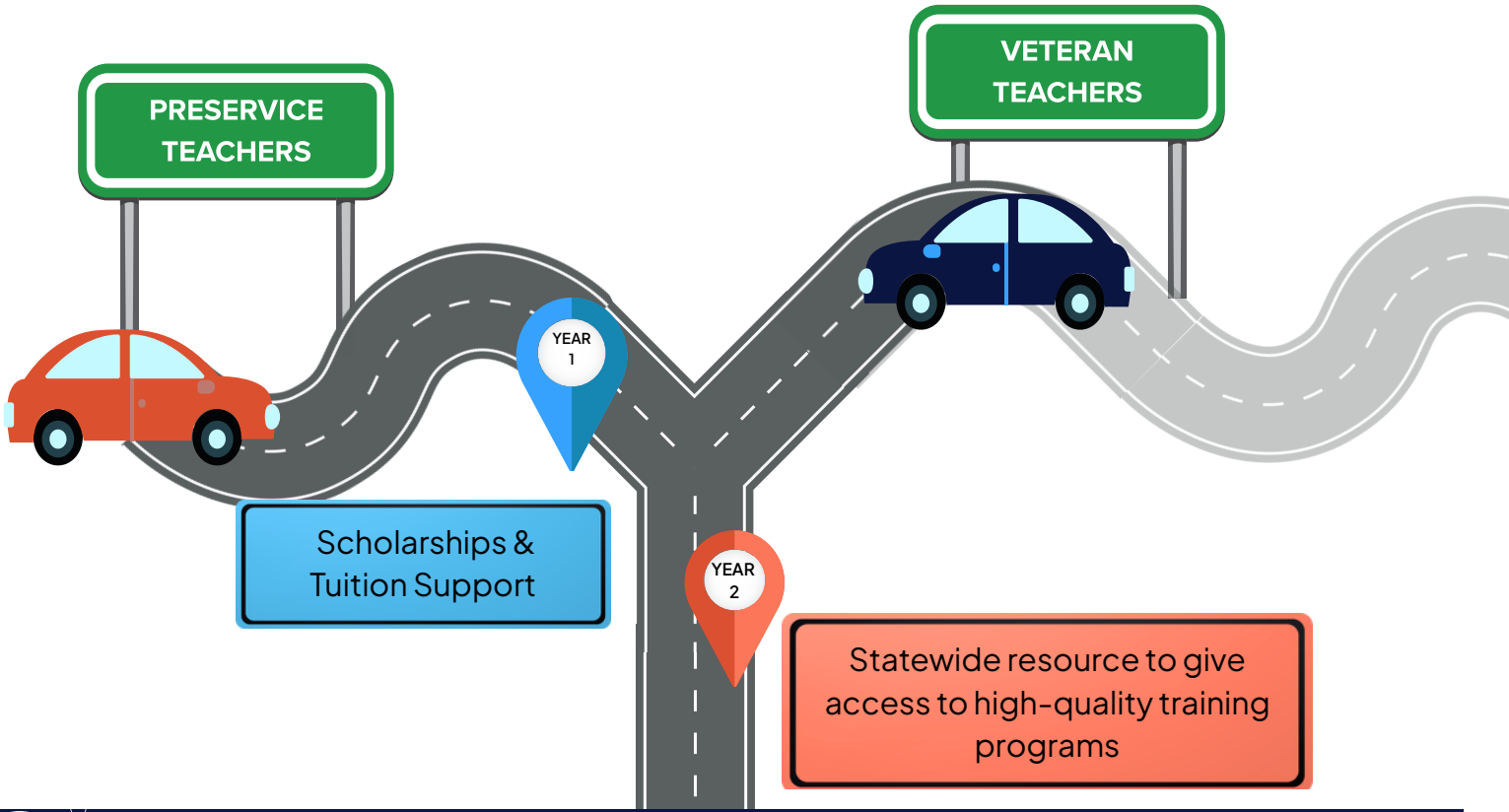
- Fund long-term sustainability
- Annual allocations
- Fund based on District Needs

RECOMMENDATION 2:

INCREASE AND SUSTAIN FUNDING FOR EXPANDING TEACHER PREPARATION AND PROFESSIONAL DEVELOPMENT

A well-prepared and well-supported teaching workforce is the cornerstone of any successful CS education initiative. However, Illinois currently faces a shortage of qualified CS educators, with many schools struggling to find teachers with the necessary credentials to deliver rigorous and engaging computing instruction. Recent research found that **only 22% of Illinois high schools have at least one certified CS teacher** (Werner & Chen, 2024). To ensure that every school has at least one qualified CS teacher, the state must prioritize funding for pre-service training, certification pathways, and ongoing professional development.

The first phase of implementation should focus on **developing financial incentives to attract new teachers** into CS education and to build teacher capacity and credentialing to support a graduation requirement. **Scholarships and tuition reimbursement programs** should be offered to pre-service candidates pursuing CS endorsements, with an emphasis on increasing diversity in the teaching workforce. For practicing teachers, a **new, flexible, tiered endorsement system** should be instituted that would allow for initial credentialing to teach introductory CS courses in addition to the more rigorous requirement currently in place. Adopting such a system reduces funding barriers and the time commitment needed to become credentialed and thereby **increases the speed by which teacher capacity can be developed.** Concurrently, a statewide resource list of post-licensure endorsement and professional development providers should be created, ensuring that current educators have access to high-quality training programs.

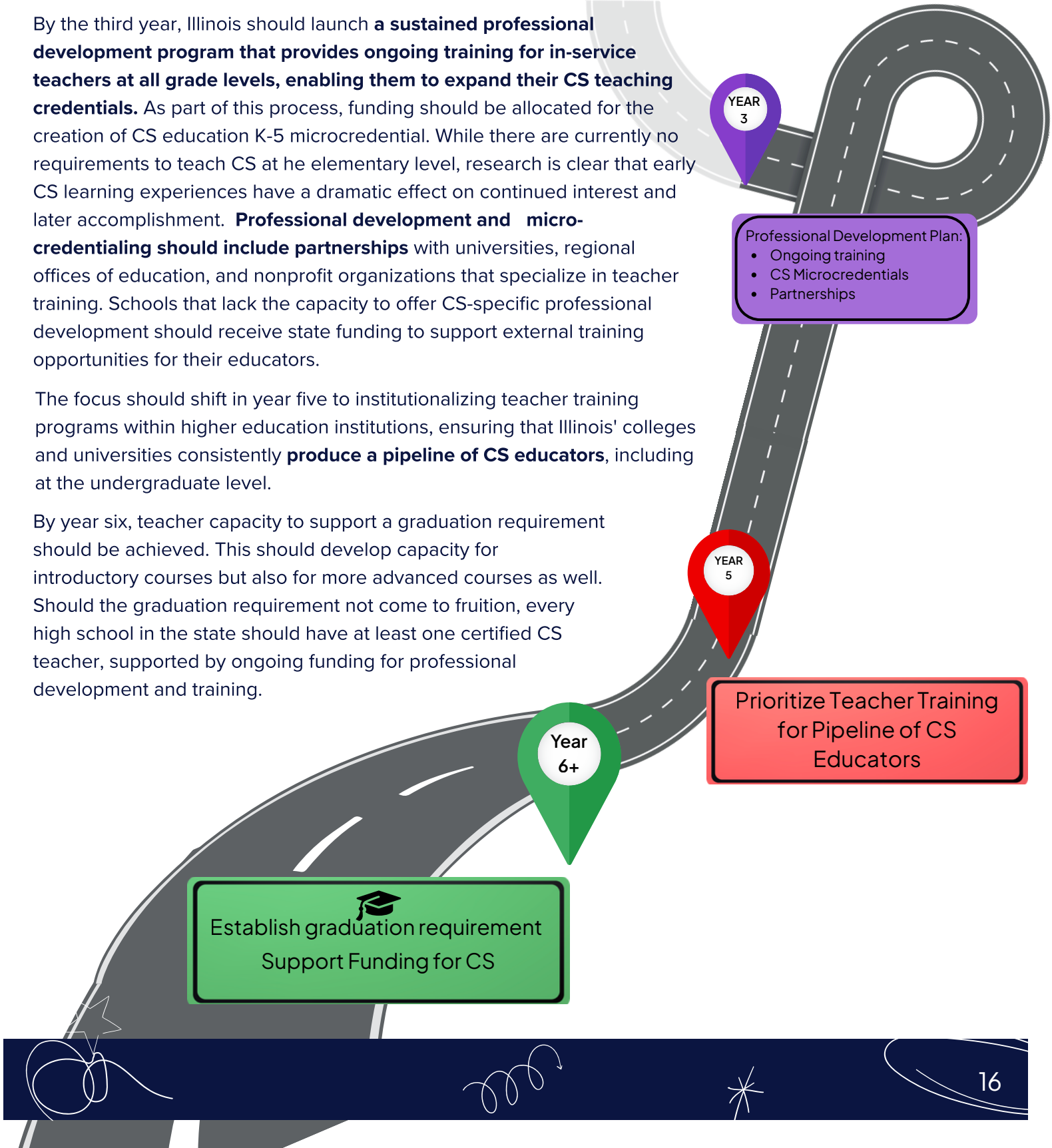


RECOMMENDATION 2 (CONTINUED): INCREASE AND SUSTAIN FUNDING FOR EXPANDING TEACHER PREPARATION AND PROFESSIONAL DEVELOPMENT

By the third year, Illinois should launch **a sustained professional development program that provides ongoing training for in-service teachers at all grade levels, enabling them to expand their CS teaching credentials.** As part of this process, funding should be allocated for the creation of CS education K-5 microcredential. While there are currently no requirements to teach CS at he elementary level, research is clear that early CS learning experiences have a dramatic effect on continued interest and later accomplishment. **Professional development and micro-credentialing should include partnerships** with universities, regional offices of education, and nonprofit organizations that specialize in teacher training. Schools that lack the capacity to offer CS-specific professional development should receive state funding to support external training opportunities for their educators.

The focus should shift in year five to institutionalizing teacher training programs within higher education institutions, ensuring that Illinois' colleges and universities consistently **produce a pipeline of CS educators**, including at the undergraduate level.

By year six, teacher capacity to support a graduation requirement should be achieved. This should develop capacity for introductory courses but also for more advanced courses as well. Should the graduation requirement not come to fruition, every high school in the state should have at least one certified CS teacher, supported by ongoing funding for professional development and training.



RECOMMENDATION 3:
STRENGTHEN K-12 CS INFRASTRUCTURE AND STUDENT ACCESS

Access to computer science education **is <u>not</u> just about teacher training and curriculum development.** It also requires substantial investments in infrastructure. Many schools, particularly those in low-income and rural areas, lack the basic technology needed to implement CS programs. **Nearly 30% of Illinois students lack reliable broadband access at home**, creating additional barriers to equitable CS learning opportunities (McGill, et. al, 2024). Reliable broadband access, up-to-date hardware, and software resources are essential for ensuring that students can fully engage in computing education.

INFRASTRUCTURE KEYS

- Broadband access at home
- Hardware Updates
- Software Resources
- Device replacement cycles

To address this, Illinois must allocate sustained funding for digital infrastructure, ensuring that schools have the technological resources necessary for CS instruction. The first phase of this initiative should focus on continuing pandemic-era digital equity efforts, leveraging data from broadband access programs to identify regions where students still face connectivity barriers. The **state should partner with broadband providers and technology companies** to expand internet access in high-need areas, ensuring that students can participate in CS learning both in and outside of school.

STATE + PARTNERSHIPS

+ Broadband Providers
+ Technology Companies
+ Private industry

*"...ensuring that **technology investments** continue to **evolve alongside** advancements in computing education."*

By the third year, funding should be directed toward **ensuring that every school has the necessary computing devices and software to support CS education**. This includes providing grants for school districts to purchase technology, maintaining device replacement cycles, and ensuring that all students have access to internet-enabled learning tools. Schools that currently lack dedicated computer labs or devices for students will be prioritized in funding allocations.

By year six, **all K-12 schools in Illinois should have the necessary infrastructure to support high-quality CS instruction.** This initiative should be sustained through a combination of state funding and partnerships with private industry, ensuring that technology investments continue to evolve alongside advancements in computing education. We further recommend the development of partnerships with organizations such as the Illinois Broadband Lab to assist in addressing issues of technology availability and access.

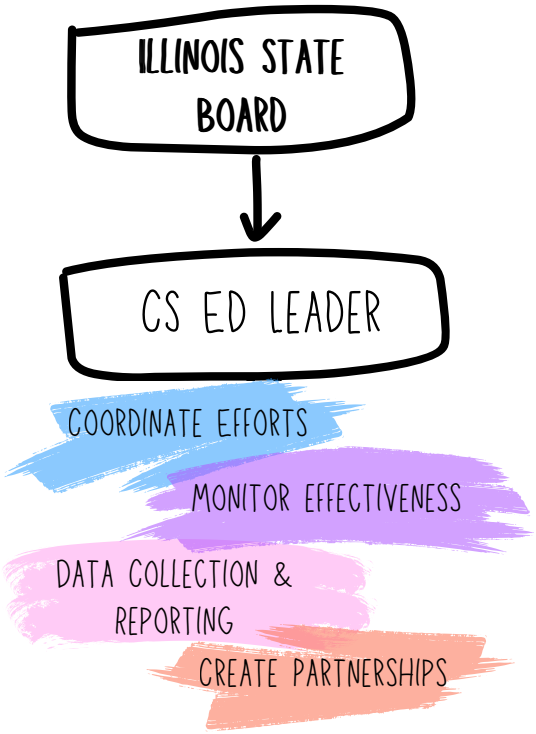
RECOMMENDATION 4:
ESTABLISH A PERMANENT STATE-LEVEL LEADERSHIP POSITION FOR CS EDUCATION

Ensuring the long-term success of CS education in Illinois requires dedicated leadership at the state level. Currently, there is no full-time position within the Illinois State Board of Education (ISBE) focused exclusively on K-12 CS education. Without centralized coordination, funding and implementation efforts risk becoming fragmented, leading to inconsistencies in program quality and sustainability (McGill et al., 2024). To address this, **Illinois must create a permanent, full-time position within ISBE dedicated to overseeing statewide CS education initiatives.** This role should be responsible for coordinating funding allocations, monitoring program effectiveness, and working with regional and national stakeholders to ensure that Illinois remains a leader in CS education policy.

The first phase of this initiative should involve securing funding for the creation of this position and defining its responsibilities. By the third year, the ISBE CS coordinator should establish partnerships with local education agencies, universities, and industry leaders to support statewide implementation efforts. The position should also oversee data collection and reporting, ensuring that funding decisions are based on measurable impact. By year six, **this leadership role should be fully integrated into ISBE's long-term strategic planning, ensuring that CS education remains a priority at the state level.** This position should serve as the primary point of contact for school districts, ensuring that funding, training, and infrastructure initiatives are effectively implemented and sustained.

PHASES OF DEVELOPMENT

- Secure funding for ISBE CS Coordinator
- Secure partnerships with:
  - local education agencies
  - universities
  - industry leaders
- Long-term vision to integrate CS position into State Strategic Planning for implemented and sustainment of initiatives



GOAL 1:

Provide Sustainable and Equitable Funding for Computer Science in Illinois

LONG-TERM VISION AND CONCLUSION

Illinois has the opportunity to build a sustainable and equitable computer science education system that ensures all students, regardless of background, have access to the knowledge and skills needed for the modern workforce. Over the next six years, targeted investments in rural and underserved schools, teacher preparation, digital infrastructure, and state-level leadership should ensure that CS education is not just an option for some students but a fundamental part of Illinois' K-12 system.

The success of this plan depends on sustained funding commitments, data-driven decision-making, and cross-sector collaboration. While CS education has been funded through the CS Equity grant at the state level, that funding has been neither targeted or strategic. By strategically implementing these initiatives, Illinois can eliminate disparities in CS access, build a robust teaching workforce, and create a future where every student has the opportunity to thrive in computing. A long-term funding and evaluation structure must be established to support these efforts beyond the six-year implementation period, ensuring that Illinois remains at the forefront of K-12 computer science education for generations to come.

GOAL # 2

STRENGTHEN TEACHER PREPARATION & TEACHER CAPACITY

Illinois faces a critical challenge in expanding computer science (CS) education due to a lack of trained educators, inconsistent professional development opportunities, and disparities in access to training resources. Currently, one in three Illinois high schools does not have a teacher with CS certification, and in many cases, CS is being taught by teachers from other disciplines who lack formal training in computing education (Werner & Chen, 2024). Without a dedicated and well-prepared teaching workforce, efforts to integrate CS into K-12 education will remain fragmented, disproportionately affecting rural and under-resourced urban schools. The success of CS education hinges on equipping teachers with the necessary training, credentials, and ongoing professional development to ensure high-quality instruction across all districts.

To address this challenge, Illinois must implement a multi-year strategy focused on enhancing teacher training and professional development, establishing a robust credentialing and certification system, and reducing regional access disparities to ensure equitable participation. By creating a structured framework that includes targeted tactics, broader strategies, and systemic policy changes, Illinois can build a sustainable and scalable CS teacher workforce that meets the needs of students statewide.

RECOMMENDATIONS

5 Expand and Enhance Teacher Learning and Professional Development

6 Establish Robust and Flexible Credentialing and Certification Pathways

7 Ameliorate Regional Access Disparties for Professional Development and Teacher Education

RECOMMENDATION 5:
EXPAND AND ENHANCE TEACHER LEARNING AND PROFESSIONAL DEVELOPMENT

One of the most immediate and impactful steps Illinois can take is to strengthen teacher training and professional development in computer science. Many educators currently lack access to high-quality, ongoing training programs, leaving them underprepared to teach CS effectively. **Expanding professional development opportunities will improve instruction and increase teacher confidence in delivering CS content.** Professional development should include pedagogical practices that help teachers effectively teach CS to all students including multiple language learners, students with disabilities, black and brown students, girls and others who have been historically marginalized and underrepresented in CS education.

1. Virtual PD Program for urban & rural Districts

2. Establish Peer Mentorship Networks & Communities (PLCs)

3. Increase Inclusion by:
   - -Stipends
   - -Certification
   - -Career Advancement

4. Annual educator PD, for CS Teachers, to stay current with **best practices & education standards.**

In the first phase of implementation, Illinois should launch pilot virtual professional development (PD) programs in both urban and rural districts to assess engagement, refine content, and identify potential barriers to participation. Peer mentorship networks and professional learning communities (PLCs) should also be established to facilitate knowledge-sharing among educators. As the initiative expands, statewide PD programs should be scaled up to ensure accessibility for all educators. Incentives such as stipends, certification, recognition, and career advancement opportunities should be introduced to encourage participation. Schools and districts should be provided with funding to cover PD costs, ensuring that financial constraints do not limit access. By the fourth year, the state should mandate annual CS professional development participation for educators teaching computing courses. This requirement will ensure that teachers remain up to date with evolving CS education standards and best practices. A continuous review process should be built into the PD system to assess effectiveness and make iterative improvements based on educator feedback.

RECOMMENDATION 6:
ESTABLISH ROBUST AND FLEXIBLE CREDENTIALING AND CERTIFICATION PATHWAYS

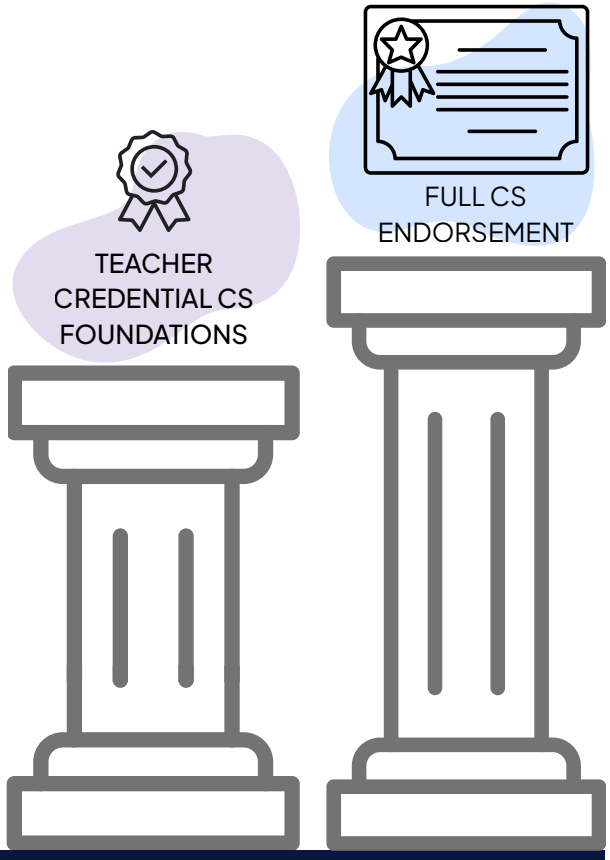
Expanding credentialing pathways will be crucial to increasing the number of certified CS teachers. **Only 5% of Illinois high school teachers currently hold a formal CS teaching endorsement** (Illinois State Board of Education, 2024). Developing a clear and flexible pathway for teacher certification is essential to addressing the shortage of qualified CS educators. Without a flexible credentialing system, many teachers, especially those from non-CS backgrounds, face significant barriers to obtaining the necessary qualifications to teach computing such as the time and expense required to achieve the credential.

Creating flexible pathways for teacher credentialing is **critical to building a robust pipeline of CS educators**. Micro-credentials at the K-5 level and a tiered endorsement system will allow non-CS teachers to transition into the field, while encouraging existing educators to pursue advanced professional growth. Partnerships with universities and professional organizations will be key to designing these systems. Micro-credentialing at the K-5 level should serve to both introduce to CS education content and pedagogy as well as further develop the skills of practitioners already teaching CS.

- K-5 Microcredentials
- Tiered Endorsement
- University Partnerships

Flexible Pathways to Increasing CS Teachers

To support this initiative, policymakers **should monitor credentialing of CS teachers to ensure highly qualified teachers of CS,** with financial assistance such as scholarships and grants to offset the cost of endorsement. It is also recommended that a tiered system of endorsement is created to address teacher capacity issues as CS education opportunities increase around the state. This tiered system of credentialing should include the continuation of the current full CS endorsement as detailed in Public Act 103-0157 as well as create a new introductory credential for teachers teaching only foundational or basic computer science at the middle and high school level. This initial credential should include no more than 8 hours of graduate level coursework and include an introduction to CS education and coursework in CS education pedagogy. **By addressing the current shortage of CS teachers, this initiative ensures Illinois can meet the growing demand for high-quality CS education.**



RECOMMENDATION 7:
ADDRESS REGIONAL ACCESS DISPARITIES FOR PROFESSIONAL DEVELOPMENT AND TEACHER EDUCATION

Significant disparities exist in access to CS education between urban, suburban, and rural districts, with many schools in underserved regions struggling to implement CS programs due to a lack of trained educators and resources. In some rural districts, fewer than 10% of students have access to a qualified CS instructor (McGill et al., 2024). Addressing these disparities is critical to ensuring that all Illinois students, regardless of their location, have equitable opportunities to learn computing skills.

In the first phase of implementation, **virtual professional development and credentialing opportunities** should be prioritized for teachers in underserved areas. This approach will provide immediate access to training without requiring extensive travel or physical infrastructure investments. A data-driven needs assessment should be conducted to identify regions with the greatest teacher shortages, guiding targeted resource allocation.

Phase One:
Focus on Teachers in underserved Areas

Virtual Professional Development Credentialing Opportunities

Over the next three years, Illinois should **establish regional CS education hubs in partnership with universities, community colleges, and local organizations**. These hubs will serve as training centers, offering in-person workshops, mentorship programs, and resource-sharing opportunities for educators. Schools in high-need areas should receive additional funding to support CS instruction, ensuring that financial constraints do not prevent implementation.

Phase Two:
Establish Regional CS Education Hubs

Partner with Higher Ed & Local Orgs
- Training Centers
- Mentorship Programs
- Resource-Sharing

By year five, the state should **implement a formalized equity-focused funding model** that ensures underserved districts receive sustained support for CS education. This model should include ongoing investments in infrastructure, teacher training, and curriculum acquisition and curation, ensuring long-term sustainability. A comprehensive evaluation process should be integrated into the initiative to measure progress, address challenges, and refine implementation strategies as needed.

Phase Three:
Equity-focused Funding Model

Funding to support:
- Infrastructure
- Teacher training
- Curriculum support

GOAL 2:

Strengthen Teacher Preparation and Teacher Capacity

LONG-TERM VISION AND CONCLUSION

Investing in teacher training, credentialing, and regional equity is essential for expanding CS education across Illinois. By prioritizing these initiatives, the state can build a strong and sustainable pipeline of qualified educators, ensuring that all students, regardless of their background, have access to high-quality computing instruction. Through a phased approach that balances immediate impact with long-term scalability, Illinois can create a model for CS education that is both effective and equitable, positioning itself as a national leader in preparing students for the future digital economy.

IMPLEMENTATION TIMELINE:

This six-year plan strategically phases in new computer science (CS) to ensure that programs are developed thoughtfully and scaled effectively. Year one is a foundational year, establishing pilot programs, creating K-5 micro-credentialing, and conducting a statewide needs assessment while forging university and district partnerships. Years two and three focus on scaling up, expanding professional development (PD) and credentialing statewide, launching regional training hubs, and providing targeted school funding based on data and early participant feedback. By years four and five, the program matures with mandatory CS teacher certification and annual PD requirements. The regional hub model becomes fully operational, and equitable funding models are formalized. The final phase, beginning in year six, centers on evaluating effectiveness, making adjustments, and institutionalizing funding to ensure the program's long-term sustainability and continued excellence in CS education.

GOAL # 3

ADVANCE COMPUTER SCIENCE EDUCATION THROUGH K-12 PATHWAYS AND GRADUATION REQUIREMENTS

As technology continues to transform industries, ensuring that all students acquire foundational CS skills is essential for workforce readiness and economic competitiveness. Over the past decade, voluntary efforts to integrate computing education into K-12 curricula have plateaued, highlighting the need for policy-driven solutions to expand access equitably.

This policy brief outlines a comprehensive three-pronged approach to strengthening CS education: (1) establishing a vertically aligned CS pathway from elementary through high school, (2) integrating CS concepts into core K-5 subjects, and (3) implementing a high school CS graduation requirement. These initiatives will ensure that all students, regardless of background, have continuous and meaningful exposure to computing education, setting them up for success in higher education and careers. Recent data underscores the need for these measures. While 60% of Illinois high schools offer a foundational CS course, only 6.4% of high school students are enrolled annually (Code.org, CSTA, & ECEP Alliance, 2024). Additionally, disparities persist, with female students making up only 32% of CS enrollment, and students from low-income backgrounds being underrepresented (Werner & Chen, 2024).

RECOMMENDATIONS

8 Establish Vertical Alignment of Computer Science Pathways

9 Integrate Computer Science into the Core Curriculum in Elementary Schools

10 Establish a High School Computer Science Graduation Requirement

RECOMMENDATION 8:
ESTABLISH VERTICAL ALIGNMENT OF COMPUTER SCIENCE PATHWAYS

The lack of a coherent, vertically aligned CS curriculum results in inconsistent student experiences, limiting engagement and retention in computing education. Many students are introduced to CS concepts in elementary school but do not encounter structured learning opportunities in middle school, creating a gap that reduces participation in high school CS coursework. To address this, **K-12 CS education must be aligned across grade levels** to ensure that early exposure is reinforced and expanded upon throughout a student's academic journey.

A comprehensive review of existing K-12 CS courses and their mapping to state standards will identify gaps and opportunities for improvement, ensuring that skills introduced in earlier grades build toward high school-level coursework. **Currently, gaps exist in middle school CS offerings, leading to lower high school participation** (Illinois State Board of Education, 2024). The creation of clear pathways will allow students to develop proficiency in computational thinking, programming, and digital literacy while also providing entry points for those who may not have been exposed to CS in earlier grades. **Professional development initiatives will be essential to equip educators** with the skills to support seamless transitions across grade levels.

The implementation of vertical alignment should occur over six years. The first phase should involve the development of a statewide CS curriculum map, revisions to standards, and pilot programs in select districts. Over the next three years, professional development opportunities should be expanded, and schools should integrate revised CS learning standards. **By year six, all districts should be required to adopt vertically aligned CS curricula that ensure continuity from elementary through high school.**

COMPUTER SCIENCE COURSES OFFERED AT ILLINOIS HIGH SCHOOLS:

60%

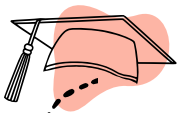
STUDENTS THAT ENROLL IN COMPUTER SCIENCE:

6%

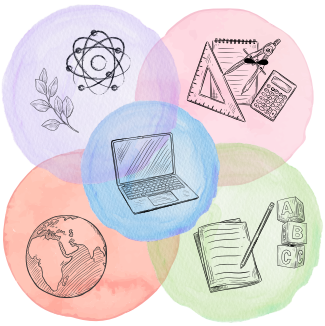
Source: Code.org, CSTA, & ECEP Allicane, 2024

BENEFITS OF FOUNDATIONS IN COMPUTER SCIENCE:

- workforce readiness
- economic competitiveness
- higher education opportunities
- career opportunities



RECOMMENDATION 9:
INTEGRATE COMPUTER SCIENCE INTO THE CORE CURRICULUM IN ELEMENTARY SCHOOLS



Embedding CS into core subjects in elementary education ensures that all students develop computational thinking skills from an early age. Recent studies show that students who receive early exposure to CS are more likely to pursue it in high school and beyond (McGill et al., 2024). Rather than treating CS as an elective or standalone subject, **this initiative focuses on integrating computing concepts** into mathematics, science, English language arts, music, and physical education.

To facilitate integration, **grade-specific lesson plans and instructional resources should be developed** to help elementary teachers incorporate CS concepts into their existing curricula. Professional development opportunities should be provided to ensure that generalist educators feel confident teaching computational thinking and problem-solving strategies. By leveraging subjects that already receive substantial instructional time, schools will be able to implement CS instruction without adding additional coursework or requiring dedicated CS instructors.

TOOLS NECESSARY FOR K-5 CS INTEGRATION:

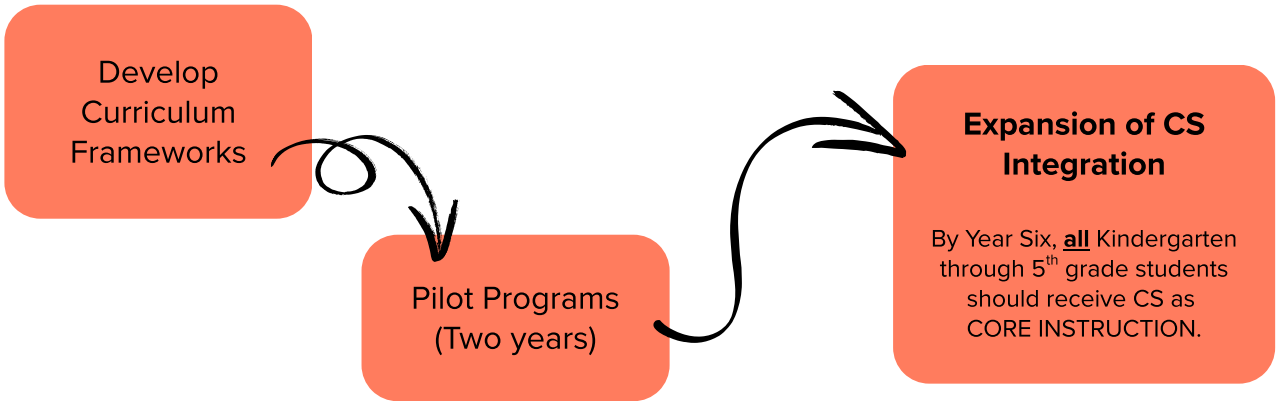
DEVELOP:

- Grade-specific lesson plans
- Instrucational resounces

PROFESSIONAL DEVELOPMENT :

- Computational Thinking
- Problem - Solving Strategies
- Structured and Unstructured Collaboration

The first phase of implementation should involve **the development of curriculum frameworks and pilot programs** in selected districts over the next two years. The following four years should see the gradual **expansion of CS integration** across all elementary schools, with **professional development scaled** accordingly. By year six, all K-5 students should receive CS instruction as part of their core learning experience.



RECOMMENDATION 10:
ESTABLISH A HIGH SCHOOL COMPUTER SCIENCE GRADUATION REQUIREMENT

Despite efforts to expand CS education in high schools, disparities in access and participation persist, particularly among students from underrepresented backgrounds. Implementing a high school CS graduation requirement ensures that all students, regardless of location or socioeconomic status, receive foundational computing education before entering the workforce or higher education. Moreover, **States that have implemented a CS graduation requirement have seen a 25% increase in enrollment** among underrepresented students (Code.org, CSTA, & ECEP Alliance, 2024. Implementing a similar requirement in Illinois will ensure that all students graduate with foundational computing skills.

IDENTIFY

Introductory Courses & Course Components

IMPLEMENT

Pilot Programs

↓

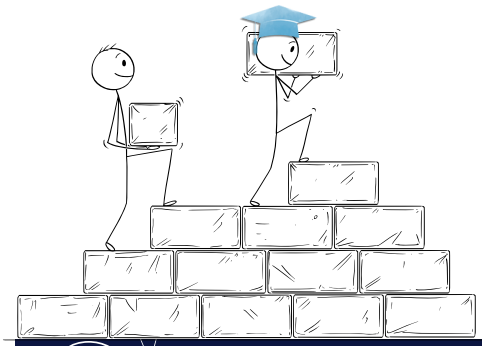
Statewide Implementation

SUPPORT

Professional Development
Regional CS Specialists

A CS graduation requirement can be designed flexibly to accommodate diverse student interests and school capacities. Identification of suitable introductory courses and course components is an essential early step. A phased approach should be used to ensure equitable implementation, beginning with a pilot program in selected districts before expanding statewide. The implementation of the graduation requirement should occur over six years. In the first three years, schools should pilot different approaches to fulfilling the requirement, with regional CS specialists providing support and evaluating outcomes. Concurrently, investments should be made to expand teacher capacity through professional development and credentialing programs. **Data collection and evaluation will inform adjustments to the requirement** before full statewide implementation in year six.

This policy draws from successful models in other states, where graduation requirements have increased CS participation **without creating additional barriers for students**. Careful planning will ensure that students in vocational programs, those requiring academic support, and those with full schedules still have flexible options to fulfill the requirement.



GOAL 3:

Advance Computer Science Education through K-12 Pathways and Graduation Requirements

LONG-TERM VISION AND CONCLUSION

The implementation of these three initiatives will create a strong and sustainable K-12 CS education framework. By aligning curriculum across grade levels, embedding CS in elementary education, and requiring high school students to complete a CS course, this policy ensures that all students develop essential computing skills.

Over six years, these initiatives should be gradually implemented to allow for capacity-building, iterative improvement, and data-driven decision-making. The state should monitor progress by collecting and analyzing participation rates, student outcomes, and implementation challenges. In doing so, policymakers and educators can refine approaches to ensure that CS education is equitable, accessible, and aligned with workforce needs.

By acting now, states can ensure that every student, regardless of background, is equipped with the digital literacy and computational skills necessary to thrive in the 21st century economy. This policy framework represents a critical step toward that future.

GOAL # 4

EXPAND AND STRENGTHEN COMPUTER SCIENCE OUTREACH IN ILLINOIS

Expanding computer science (CS) education beyond the classroom is essential for ensuring equitable access to computing skills, particularly for students in underserved communities. Out-of-school CS programs provide opportunities for students to explore computing through hands-on experiences, mentorship, and industry engagement. However, access to these programs varies widely across Illinois, with rural communities and low-income students often facing significant barriers to participation. Addressing these gaps requires a systematic approach that includes mapping existing opportunities, strengthening connections between formal and informal learning environments, leveraging data for strategic investments, and expanding educator training to support out-of-school CS learning.

A multi-year plan is recommended to strengthen CS outreach through the development of a statewide opportunity map, the creation of stronger linkages between in-school and out-of-school learning, the use of data-driven advocacy to shape policy and funding decisions, and the establishment of professional development pathways for educators leading out-of-school CS programs. These efforts will ensure that students across Illinois, regardless of location or socioeconomic background, have access to high-quality computing education that prepares them for future careers in technology.

RECOMMENDATIONS

11 Develop a Comprehensive Statewide Opportunity Map for CS Programs

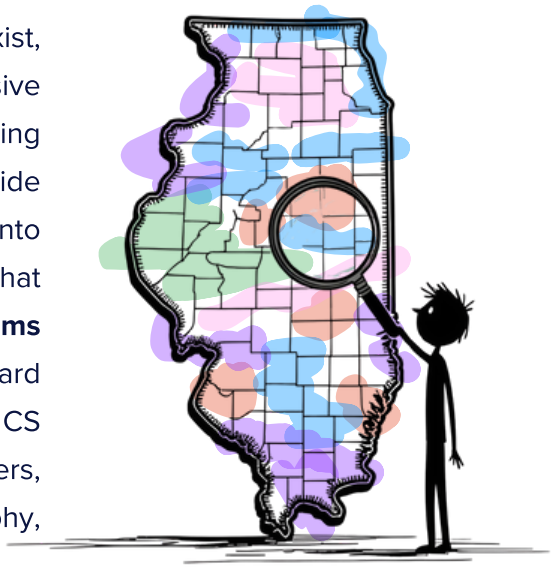
12 Strengthen the Connection between In-School and Out-of-School CS Learning

13 Expand CS Outreach through Data-Driven Advocacy and Funding

14 Strengthen Educator Training and Credentialing for Out-of-School CS Instruction

RECOMMENDATION 11:
DEVELOP A COMPREHENSIVE STATEWIDE OPPORTUNITY MAP FOR CS PROGRAMS

A foundational step in expanding CS outreach is **the development of a statewide opportunity map** that identifies where programs exist, who they serve, and where gaps remain. Without a comprehensive understanding of the landscape, outreach efforts risk reinforcing existing disparities rather than addressing them. A statewide database tracking CS outreach programs will provide insights into gaps and direct resources to underserved areas. Studies show that students in s**chools with partnerships with external CS programs are 40% more likely to continue CS coursework** (Illinois State Board of Education, 2024). The opportunity map will document CS programs offered by schools, libraries, community centers, nonprofits, and industry partners, categorizing them by geography, age group, and focus area.



The first phase of this initiative should **focus on data collection**, leveraging prior work conducted by local researchers and organizations to create an initial database of CS outreach programs. Over the next two years, **the map should be refined and expanded,** incorporating feedback from stakeholders to ensure accuracy and usability. By year three, the opportunity map should be f**ully operational and integrated** into state education planning efforts, serving as a tool for schools, policymakers, and community organizations to guide investment in CS outreach.

To ensure sustainability, state policy should **mandate an annual update of the opportunity map**, requiring organizations that receive public funding for CS outreach to report on their programs. In addition, funding should be allocated to fill identified gaps, particularly in rural and low-income areas where CS learning opportunities are currently limited.

PHASE ONE

- Data Collection
- Leverage Connections

PHASE TWO

- Refine maps and expand.
- Feedback cycles for accuracy & usability.

Year 3:

- Operational & integrated for all stakeholders

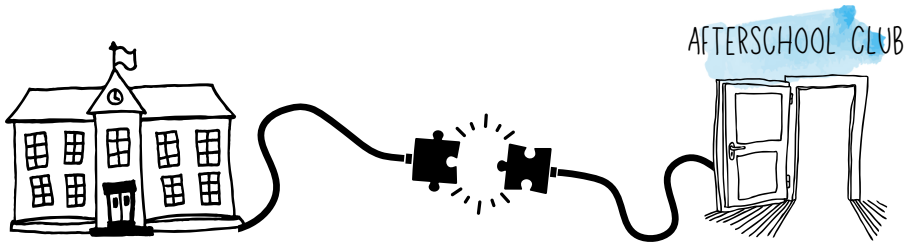
SUSTAINABILITY

- Mandate updates
- Require funding
- Identify gaps and allocate funds to support identified gaps in opportunity

RECOMMENDATION 12:
STRENGTHEN THE CONNECTION BETWEEN IN-SCHOOL AND OUT-OF-SCHOOL CS LEARNING

While out-of-school programs provide valuable learning experiences, their impact is often limited by a lack of alignment with school-based CS education. To bridge this gap, **Illinois should develop a crosswalk that connects in-school and out-of-school CS learning,** ensuring students can build on their skills across different environments. This should include developing shared learning goals, establishing pathways for students to earn credit for out-of-school learning, and fostering partnerships between schools and community organizations. States that have formalized these connections have increased CS participation among low-income students by 35% (McGill et al., 2024).

"STATES THAT HAVE FORMALIZED CONNECTIONS HAVE INCREASED CS PARTICIPATION AMONG LOW-INCOME STUDENTS BY **35%**."



The first phase of this initiative should involve convening educators, nonprofit leaders, and industry partners to identify ways to align curriculum and establish a framework for credit recognition. Over the next three years, professional development programs should be launched to support educators in integrating out-of-school CS experiences into classroom learning. By year five, Illinois will have established a formal mechanism for ensuring students can seamlessly transition between in-school and out-of-school CS programs, reinforcing long-term engagement in computing education. To institutionalize these connections, state policy should establish guidelines for integrating out-of-school CS experiences into school-based credit structures. Additionally, funding should be allocated to support partnerships that connect schools with local CS programs, **ensuring that students have access to a broad range of computing experiences**.

ALIGN CURRICULUM
ESTABLISH FRAMEWORK

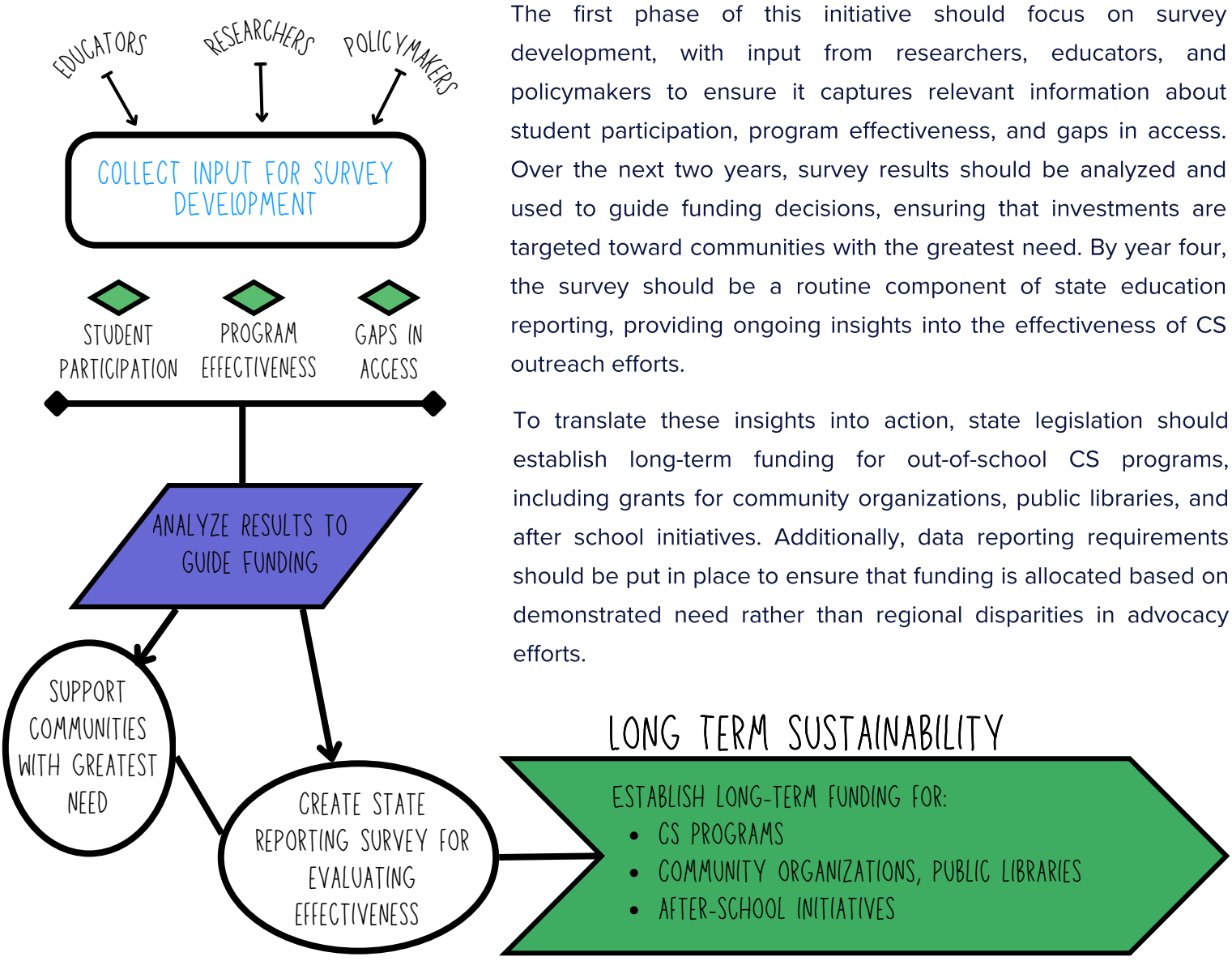
PROFESSIONAL DEVELOPMENT
SUPPORT INTEGRATION OF
PARTNERSHIPS

ESTABLISH FORMAL TRANSITIONS
BETWEEN IN & OUT-OF-SCHOOL
PROGRAMS

RECOMMENDATION 13:

EXPAND CS OUTREACH THROUGH DATA-DRIVEN ADVOCACY AND FUNDING

Currently, **only 20% of Illinois high schools receive dedicated CS outreach funding**, highlighting the need for expanded investment (Werner & Chen, 2024). Ensuring equitable access to CS outreach programs requires a data-driven approach that identifies barriers to participation and directs resources where they are needed most. To support this effort, Illinois should launch a statewide survey to assess CS outreach efforts and determine which students have access to programming. This survey should be integrated into existing data collection initiatives to avoid duplication and maximize efficiency.



The first phase of this initiative should focus on survey development, with input from researchers, educators, and policymakers to ensure it captures relevant information about student participation, program effectiveness, and gaps in access. Over the next two years, survey results should be analyzed and used to guide funding decisions, ensuring that investments are targeted toward communities with the greatest need. By year four, the survey should be a routine component of state education reporting, providing ongoing insights into the effectiveness of CS outreach efforts.

To translate these insights into action, state legislation should establish long-term funding for out-of-school CS programs, including grants for community organizations, public libraries, and after school initiatives. Additionally, data reporting requirements should be put in place to ensure that funding is allocated based on demonstrated need rather than regional disparities in advocacy efforts.

RECOMMENDATION 14:

STRENGTHEN EDUCATOR TRAINING AND CREDENTIALING FOR OUT-OF-SCHOOL COMPUTER SCIENCE INSTRUCTION

Expanding access to out-of-school CS learning requires a well-trained workforce capable of delivering high-quality instruction. However, many out-of-school CS programs rely on educators, librarians, and community leaders who may not have formal CS teaching credentials. To address this challenge, **Illinois should develop professional development pathways for out-of-school CS educators**, including micro-credentialing programs and training in instructional best practices.

The first phase of this initiative should focus on designing training programs in collaboration with higher education institutions, industry partners, and nonprofit organizations. Over the next three years, Illinois should roll out a micro-credentialing system that allows educators to gain recognition for their expertise in CS instruction. By year five, policies should be in place to establish minimum qualifications for out-of-school CS instructors, ensuring consistency and quality across programs. **State policy should support the expansion of professional development opportunities by providing funding for educators** to participate in training and establishing alternative credentialing pathways for industry professionals interested in transitioning into CS education. Additionally, financial incentives such as stipends or tuition reimbursement should be offered to educators who complete CS training programs, ensuring a steady pipeline of qualified instructors for out-of-school learning initiatives.

STEPS TO INCREASE CS EDUCATORS:

- PARTNERSHIPS WITH HIGHER ED, INDUSTRY, NON-PROFIT ORGS
- ROLL OUT MICRO-CREDENITIALING SYSTEM TO GAIN RECOGNITION FOR EXPERTISE
- QUALIFICATIONS FOR OUT-OF-SCHOOL INSTRUCTORS
- SUPPORT EXPANSION BY PROVIDING FUNDING: STIPENDS, TUITION REIMBURSEMENT

GOAL 4:

Expand and Strengthen Computer Science Outreach in Illinois

LONG-TERM VISION AND CONCLUSION

Over the next six years, Illinois should take a phased approach to expanding and strengthening CS outreach efforts. The first two years should focus on foundational work, including data collection, stakeholder engagement, and pilot initiatives. By year three, key systems such as the opportunity map and educator training programs should be in place, allowing for expanded implementation. In years four through six, these initiatives will be scaled statewide, with policies formalized to ensure long-term sustainability.

The ultimate goal is to create a robust, interconnected CS education ecosystem in which all students, regardless of background or geography, have access to meaningful computing experiences both in and out of school. By leveraging data, strengthening partnerships, and investing in educator training, Illinois will position itself as a national leader in equitable and high-impact CS outreach. Ensuring that these initiatives remain sustainable will require ongoing commitment from state policymakers, educators, industry partners, and community organizations. With a coordinated and data-driven approach, Illinois can close existing gaps in CS education and provide all students with the opportunities they need to succeed in a technology-driven world.

GOAL # 5

STRENGTHEN COMPUTER SCIENCE EDUCATION THROUGH RESEARCH AND DATA REPORTING IN ILLINOIS

The landscape of computer science (CS) education in Illinois is rapidly evolving, with increased recognition of the need for structured pathways, teacher preparation, and equitable access across K-12 education. Despite significant progress, gaps remain in data collection, teacher preparedness, and the alignment of high school CS coursework with post-secondary education and workforce needs. To address these challenges, a robust research agenda must be established, informed by actionable data and guided by state-level policies that ensure sustainable and equitable access to CS education.

There are three key areas for advancing CS education research in Illinois. First, the creation of a publicly accessible data portal will provide comprehensive insight into CS access across the state, enabling data-driven decision-making. Second, a focused research agenda on CS teacher preparation and retention will help establish best practices for educator support, ensuring a strong and sustainable teaching workforce. Finally, a systematic evaluation of high school-to-postsecondary CS pathways will strengthen students' transition from K-12 education into higher education and the workforce. Together, these initiatives form a long-term research framework that will drive improvements in Illinois' CS education ecosystem over the next six years.

RECOMMENDATIONS

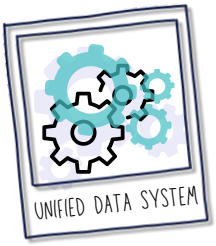
15 Establish a Publicly Accessible Computer Science Education Data Portal

16 Develop a Research Agenda for Computer Science Teacher Preparation and Retention

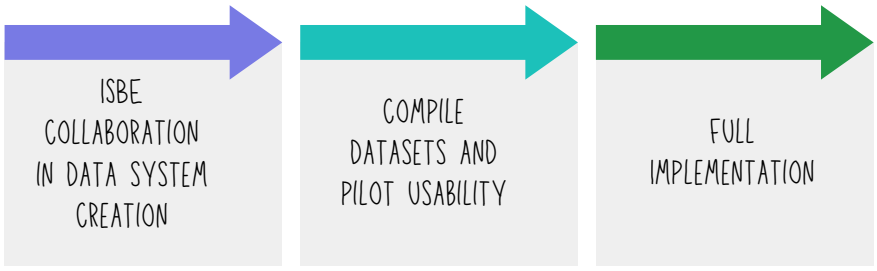
17 Strengthen High School to Post-Secondary Computer Science Pathways

RECOMMENDATION 15:
ESTABLISH A PUBLICLY ACCESSIBLE COMPUTER SCIENCE EDUCATION DATA PORTAL

A critical component of advancing CS education in Illinois is the ability to collect, analyze, and disseminate data that provides a clear picture of access and participation in CS coursework. Currently, Illinois lacks a unified data system to track CS participation across K-12 schools, making it difficult to assess the impact of policies and funding (McGill, Giglio, Thigpen, & Lu, 2024). Without a centralized system, stakeholders, including educators, policymakers, and researchers, lack the ability to make informed decisions regarding resource allocation and curriculum development. To address this, **a publicly accessible data portal should be developed, containing real-time information on K-12 CS course offerings, enrollment demographics, and teacher licensure.**

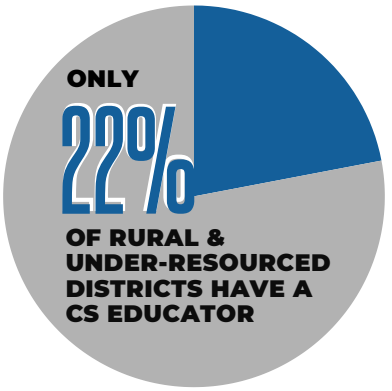


The Illinois State Board of Education (ISBE) should play a central role in structuring this data collection system, ensuring consistency across districts. The portal should not only provide raw data but also incorporate user-friendly visualization tools that allow districts with limited CS offerings to identify gaps and develop targeted interventions. This initiative should be implemented in phases over the next five years. The first phase should involve collaboration with ISBE's Data & Strategies team to determine the structure and scope of the portal. By year two, initial datasets should be compiled, and pilot districts will test the usability of the system. Years three through five should focus on full implementation, ongoing updates, and district-wide adoption. To ensure sustainability, state policy must establish clear mandates for consistent data collection at the elementary and middle school levels, where CS is often integrated into broader coursework. Additionally, a formal process for updating and maintaining the portal must be codified, preventing data stagnation and ensuring its long-term relevance.



RECOMMENDATION 16:
DEVELOP A RESEARCH AGENDA FOR COMPUTER SCIENCE TEACHER PREPARATION AND RETENTION

A well-prepared and sustainable CS teaching workforce is essential to expanding access to high-quality computing education. However, Illinois faces persistent challenges in recruiting, preparing, and retaining CS educators, particularly in rural and under-resourced districts. Currently, only 22% of Illinois high schools have at least one certified CS teacher, underscoring the need for targeted research on effective teacher preparation strategies (Werner & Chen, 2024). **To address this issue, a comprehensive research agenda must be developed to examine factors influencing teacher preparedness, rigor, and long-term retention.**



RESEARCH

The first stage of this initiative should involve conducting a literature review **to identify best practices in CS teacher training and professional development.** Educators should be engaged in this process to ensure that research questions align with classroom realities. By year two, partnerships with ISBE and regional offices of education should be established to **track teacher licensure data and determine the effectiveness** of existing certification pathways.

PARTNERSHIPS

Over the following three years, **data-driven recommendations should inform policy changes**, including the potential revision of Illinois' CS teacher endorsement requirements. A key focus should be the evaluation of alternative certification pathways, ensuring that educators from diverse backgrounds can enter the CS teaching profession without unnecessary barriers. To incentivize teacher retention, Illinois should explore policies such as tuition reimbursement and salary incentives for CS educators.

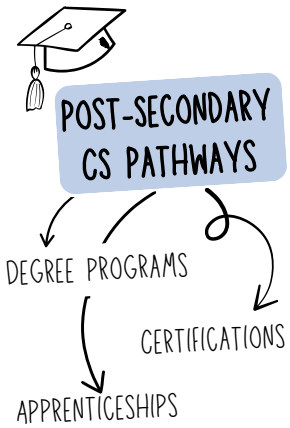
USE DATA TO INFORM

By year six, the research findings should guide the formal adoption of any new CS teacher standards, including updates to the Computer Science Teachers Association (CSTA) K-12 standards set for revision in 2026. Additionally, teacher licensure data should be integrated into the Illinois Longitudinal Data System (ILDS), allowing for **ongoing monitoring of teacher preparation trends and workforce needs.**

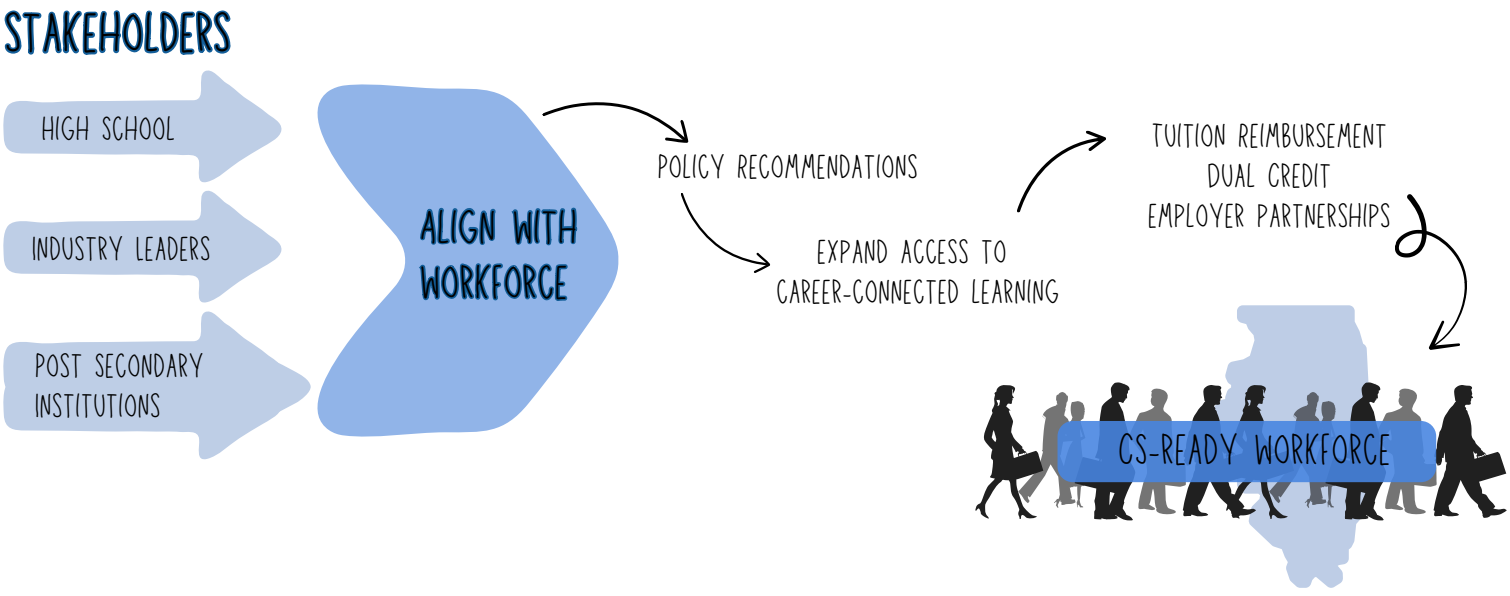
ONGOING MONITOR

RECOMMENDATION 17:
STRENGTHEN HIGH SCHOOL TO POST-SECONDARY COMPUTER SCIENCE PATHWAYS

Ensuring that high school **CS coursework aligns with post-secondary education and workforce needs is critical** to preparing students for future careers in technology-related fields. However, many Illinois students face unclear pathways from high school CS courses to college majors, technical certifications, or industry employment (Illinois State Board of Education, 2024). To address this, a structured research agenda should be developed to analyze the impact of high school CS access on students' progression through post-secondary pathways.



The first phase of this initiative should focus on mapping Illinois' existing post-secondary CS pathways, including degree programs, industry-recognized certifications, and apprenticeships. Comparative analyses of successful pathway models from other states, such as Texas, should be conducted to identify best practices. By year three, engagement with high school stakeholders, industry leaders, and post-secondary institutions should provide insights into how CS coursework can better align with workforce needs. Over the next three years, policy recommendations should be developed to expand access to career-connected learning opportunities. This may include tuition reimbursement programs for students pursuing CS degrees, expanded dual-credit opportunities for high school students, and partnerships with Illinois employers to offer internship programs. To facilitate long-term tracking of student outcomes, CS education data should be incorporated into ILDS, ensuring that state policymakers can evaluate the effectiveness of these interventions.



GOAL 5:

Strengthen Computer Science Education Through Research and Data Reporting in Illinois

LONG-TERM VISION AND CONCLUSION

The successful implementation of these initiatives will require sustained collaboration between policymakers, educators, and researchers. Over the next six years, Illinois should take a phased approach to improving CS education research, ensuring that data-driven policies support equitable access, high-quality instruction, and strong career pathways. By creating a centralized data portal, developing a robust teacher preparation research agenda, and strengthening high school-to-post-secondary pathways, Illinois can build a computing education system that meets the needs of all students.

Long-term sustainability will depend on clear policy mandates that require regular data collection, research-driven decision-making, and financial investments in teacher preparation and student career pathways. Through this comprehensive research agenda, Illinois will position itself as a leader in CS education, ensuring that all students, regardless of background, have the opportunity to develop the computational skills necessary for success in the modern economy.

GOAL # 6

PROVIDE GUIDANCE AND RECOMMENDATIONS ON AI TOOLS, PRACTICES AND POLICIES

Artificial intelligence (AI) is a profound technological shift already reshaping work and learning. It has entered schools as an arrival technology, with students and teachers using it before policies existed (Smith et al., 2025). Illinois has responded with SB1920, the Artificial Intelligence in Education Guidance Act, directing the Illinois State Board of Education (ISBE) to create statewide guidance by July 1, 2026 (Illinois General Assembly, 2023). This mandate highlights the need for proactive, ethical, and adaptable policies.

AI offers opportunities and risks. It has the potential to help scaffold lessons, provide feedback, and support multilingual learners and students with special needs. Yet frequent reliance risks "cognitive offloading" and weakened problem solving, with effect sizes more negative than many instructional practices (Oregon Department of Education, 2025). Schools must preserve productive struggle, encourage reflection, and foster creativity. Teachers need AI literacy training to identify bias, misinformation, and poor-quality outputs, while policies should remain iterative to evolve with tools (Smith et al., 2025).

To meet both legislation and student needs, Illinois should pursue a six-part strategy emphasizing curriculum, professional learning, policy and governance, and equity initiatives. Grounded in ethics and inclusive decision-making, this approach will prepare all students with the critical thinking, ethical awareness, and practical skills required to thrive in an AI-powered world, while positioning Illinois as a leader in educational innovation. Above all, leaders at all levels should exercise caution as AI and our learning about AI continues to evolve.

RECOMMENDATIONS

- 18 Promote Statewide AI Literacy for All Students
- 19 Expand Professional Learning for Teachers and Leaders
- 20 Create Clear and Equitable Guidance on the Use of AI in Schools
- 21 Close the Emerging AI Equity Gap
- 22 Foster Innovation Through Research and Pilot Programs
- 23 Establish an Illinois AI in Education Task Force

RECOMMENDATION 18:
PROMOTE STATEWIDE AI LITERACY FOR ALL STUDENTS

Artificial Intelligence (AI) is transforming the world students are entering, influencing everything from personal decisions and media consumption to career pathways and democratic participation. Despite this, **most students lack structured instruction in how AI works or how to think critically about its impacts**. Fewer than half feel their schools are preparing them for an AI-powered future, and nearly half of young people aged 17 to 27 report difficulty identifying inaccuracies in AI-generated content (Merriman & Sanz Sáiz, 2024). AI literacy must become a foundational part of every student's education.

RECOMMENDATION:

Integrate AI literacy into Illinois's K–12 curriculum standards and classroom instruction by embedding core AI concepts, ethical inquiry, and real-world applications across disciplines and grade levels.

This work should begin by identifying grade-band-aligned AI learning outcomes based on frameworks like AI4K12's "5 Big Ideas" and the OECD's AILit Framework (CSTA & AI4K12, 2025; OECD, 2025). In the short term, the state should fund model lesson plans and classroom pilot projects that incorporate AI literacy into social studies, ELA, math, and science. These pilots can help develop classroom-ready examples and provide evidence for wider adoption.

Strategically, Illinois should revise its computer science and digital literacy standards to explicitly include AI literacy for all students, not just those enrolled in advanced or elective CS courses. This integration should be supported by cross-disciplinary guidance, teacher training, and alignment with civic education and workforce readiness goals.

At the policy level, the State Board of Education should issue an AI Literacy Integration Plan by 2026, outlining timelines, core concepts, implementation supports, and an equity strategy to ensure inclusive access statewide.

CORE AI CONCEPTS

from AI4K12:

RECOMMENDATION 19:
EXPAND PROFESSIONAL LEARNING FOR TEACHERS AND LEADERS

Teachers and school leaders are being asked to engage with AI technologies without adequate training or guidance. Only 20 percent of educators report feeling equipped to use generative AI tools in the classroom, and fewer than one in three have received any professional development in AI-related content (EdWeek Research Center, 2024; HMH, 2023). This gap undermines effective integration and contributes to a growing equity divide in how students experience AI in schools.

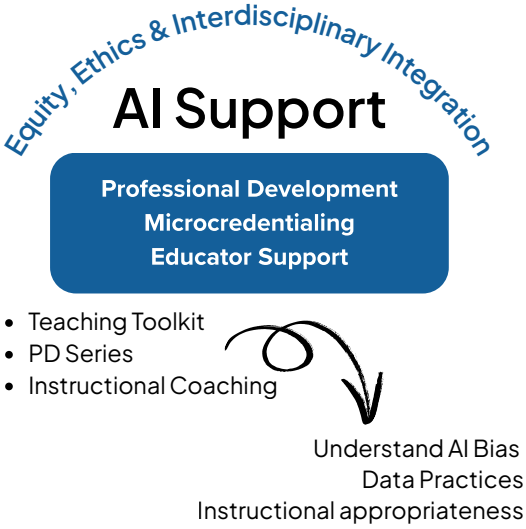
RECOMMENDATION:

Create a statewide system of professional development, microcredentialing, and support for educators to teach about and with AI, with **a focus on equity, ethics, and interdisciplinary integration.**

In the near term, Illinois should **launch an AI Teaching Toolkit and accompanying PD series** that includes asynchronous modules and in-person learning tied to instructional coaching. These should be available to educators across subjects and grade levels, including non-CS teachers. Programs must also include training on evaluating AI tools for bias, data practices, and instructional appropriateness.

Longer term, Illinois should **establish AI-focused teacher learning communities, mentorship networks, and AI literacy integration pathways** in teacher preparation programs. A strategic goal should be to develop AI-specialized instructional coaches who can support districts statewide, particularly in high-need regions.

Policy mechanisms must include dedicated annual funding for AI-related PD through ESEA Title II-A, requirements for AI training in educator licensure renewal by 2028, and incentives for higher education institutions to align educator preparation programs with the AILit Framework (OECD, 2025).



RECOMMENDATION 20:
CREATE CLEAR AND EQUITABLE GUIDANCE ON THE USE OF AI IN SCHOOLS

The rapid expansion of AI tools in education has outpaced existing school policies. While students and teachers are already using AI applications for writing, feedback, tutoring, and administrative tasks, most school systems lack consistent, clear policies to guide these uses (Education Week Research Center, 2024). **Students express concern about how their data is being used, and educators need support in understanding what is allowed and what best practices look like** (Center for Democracy & Technology, 2023).

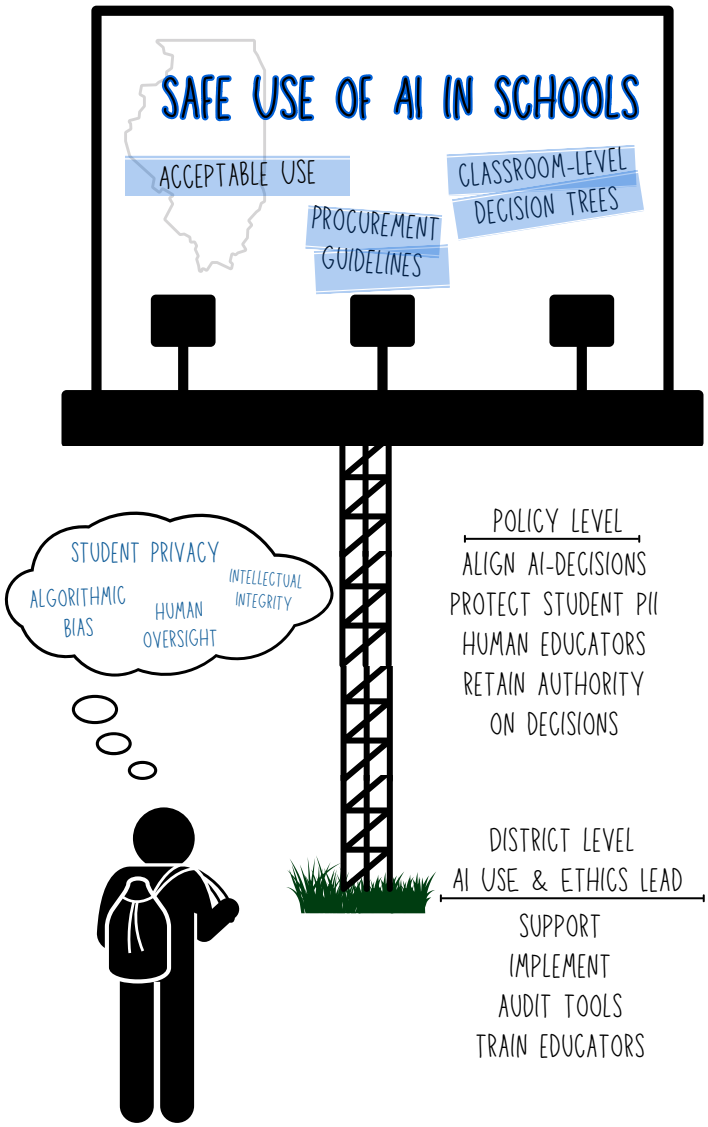
RECOMMENDATION:

Issue comprehensive state guidance on the safe, ethical, and equitable use of AI in schools, with model policies and tools that districts can adapt.

Tactically, t**he Illinois State Board of Education should release a "Safe Use of AI in Schools" toolkit** that includes a model acceptable use policy, procurement guidelines, and classroom-level decision trees. The guidance should address topics such as student privacy, intellectual integrity, algorithmic bias, and human oversight.

Strategically, the state should require each district to **designate an AI Use and Ethics Lead** by 2027 who can oversee implementation, conduct audits of AI tools, and facilitate educator training. Ongoing updates to the state guidance should be informed by evolving best practices, stakeholder feedback, and research findings.

At the policy level, **AI-related decisions must align with FERPA, COPPA, and IDEA Part B** (U.S. Department of Education, 2023; Public Interest Privacy Center, 2024). The guidance should reaffirm that students' personally identifiable information must not be used to train commercial AI systems without explicit consent, and that human educators must retain authority in all high-stakes educational decisions.



RECOMMENDATION 21:
CLOSE THE EMERGING AI EQUITY GAP

Without intervention, **AI integration risks amplifying long-standing inequities in education**. Students in lower-income, rural, or under-resourced schools may lack not only access to AI-enhanced tools but also the instructional supports to engage with them critically and creatively (Classroom Perspectives on AI, 2023; TeachAI, 2025). Equity must be a cornerstone of Illinois's AI strategy to ensure all students benefit from these technologies.

RECOMMENDATION:

Develop **a targeted, equity-focused initiative** to expand AI access, participation, and critical engagement opportunities for students in historically marginalized and under-resourced communities.

Short term, **the state should provide AI Access and Learning Grants** to districts serving Title I populations and rural communities. These grants should cover hardware, internet connectivity, classroom-ready AI tools, and training for staff to implement inclusive, project-based AI instruction.

Strategically, the state should **establish regional AI Equity Hubs** in partnership with universities, libraries, and community-based organizations. These hubs can serve as centers for teacher training, family engagement, and after-school AI exploration programs, modeled on successful digital equity initiatives.

At the policy level, **Illinois should adopt an AI Equity Framework** to guide all AI-related decisions in K–12 education. This framework should mandate disaggregated data collection on AI access and use, require universal design and language accessibility in all AI tools used in classrooms, and include enforceable criteria in edtech procurement processes to ensure inclusivity.

Equity Gap Concerns

- Lack of AI tools
- Lack AI Instructional supports

Recommendations

- Expand AI access, participation & critical engagement
- Provide grants for AI Access and Learning
- Establish Regional Equity Hubs in partnerships
- Adopt AI Equity Frameworks to guide AI in K-12 education

RECOMMENDATION 22:
FOSTER INNOVATION THROUGH RESEARCH AND PILOT PROGRAMS

INTRODUCTION #5:

AI presents novel challenges for educational implementation, but it also **offers opportunities for bold experimentation and learning**. However, few school systems have the resources or support to pilot emerging technologies and evaluate their outcomes. Without research and field testing, well-meaning initiatives may falter or produce unintended harms (CSTA & AI4K12, 2025; TeachAI, 2025).

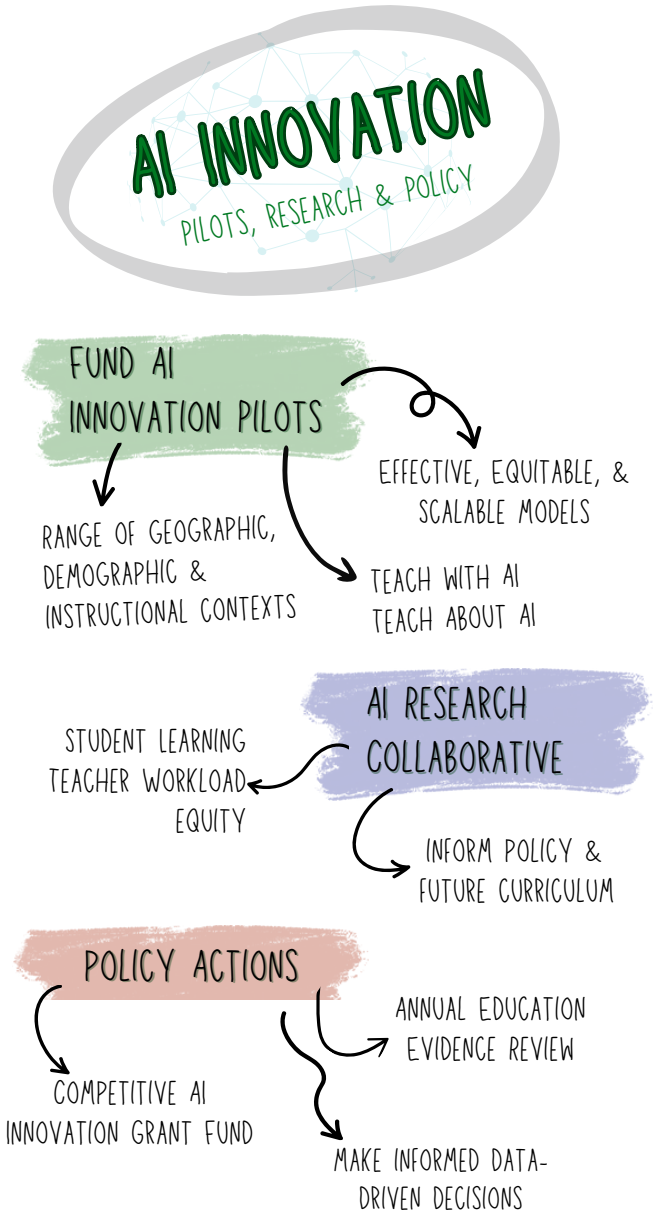
RECOMMENDATION:

Launch **a coordinated program** of AI research, innovation, and pilot testing to identify effective, equitable, and scalable models of AI integration in education.

In the short term, Illinois should fund 20–30 one-year **AI Innovation Pilots** in districts that represent a range of geographic, demographic, and instructional contexts. These pilots should explore both **teaching with AI** (e.g., AI tutors, feedback tools) and **teaching about AI** (e.g., student projects, ethics debates).

Strategically, the state should **create an Illinois AI Research Collaborative** that partners with universities, regional offices of education, and industry experts to study the impact of AI on student learning, teacher workload, and equity. Findings from these partnerships should inform state policy and future curriculum development.

Policy actions should include the creation of an annual "AI in Education Evidence Review" by the Illinois State Board of Education and a competitive innovation grant fund aligned with state AI priorities. These efforts will help ensure that state leaders make informed, data-driven decisions.



RECOMMENDATION 23:
ESTABLISH AN ILLINOIS AI IN EDUCATION TASK FORCE

AI policy intersects with curriculum, teacher training, data privacy, equity, school safety, and workforce readiness. Illinois **needs a coordinated, multi-sector body to ensure that AI-related decisions reflect broad stakeholder input and remain focused on student well-being and learning** (TeachAI, 2025; U.S. Department of Education, 2023).

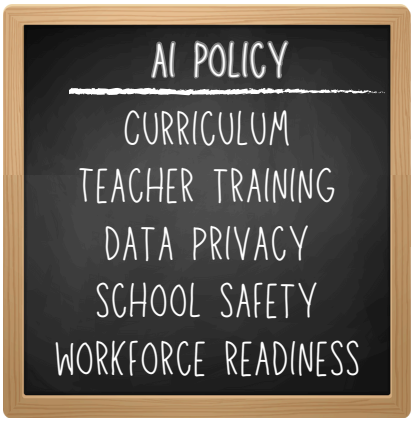
RECOMMENDATION:

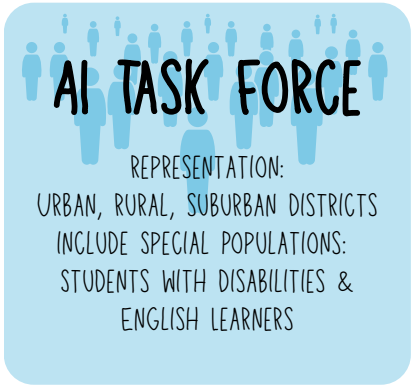
Establish a statewide AI in Education Task Force composed of educators, students, policymakers, researchers, parents, technology leaders, and civil rights advocates to guide the ethical and effective implementation of AI in schools.

As an immediate step, the Governor's Office and the State Board of Education should appoint members representing urban, rural, and suburban districts, and ensure representation from special populations, including students with disabilities and English learners. The task force should begin meeting quarterly in 2026.

Strategically, **this group should lead the development of Illinois's AI in Education Roadmap,** which outlines a 5-year vision for integrating AI across K–12 systems, with benchmarks in areas such as curriculum, teacher preparation, infrastructure, and evaluation.

Policy outcomes should include the formal adoption of recommendations from the task force by the legislature or State Board and the creation of a permanent AI oversight advisory committee. This will ensure transparency, cross-agency coordination, and continued responsiveness as AI technologies and educational needs evolve.



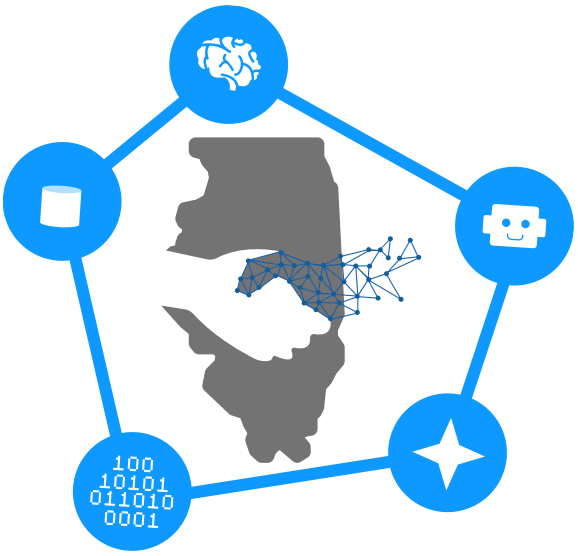


INTEGRATE AI ACROSS K-12 SYSTEMS
CURRICULUM, TEACHER PREPARATION,
INFRASTRUCTURE, & EVALUATION

RECOMMEND ADOPTION OF AI LEGISLATION
PERMANENT AI OVERSIGHT COMMITTEE

THE AI BIG PICTURE

Artificial intelligence (AI) represents a profound technological shift, already reshaping both the world students are inheriting and the realities they currently live in. AI is altering the very nature of human work, which makes its integration into education both urgent and unavoidable. It has entered schools as an "arrival technology," with students and teachers using it before districts could set policy (Smith et al., 2025). Illinois has taken an important step with SB1920, the Artificial Intelligence in Education Guidance Act, which directs the Illinois State Board of Education (ISBE), in consultation with stakeholders, to create statewide guidance on AI in K–12 education by July 1, 2026 (Illinois General Assembly, 2023). This mandate underscores the need for proactive, ethical, and evidence-based policies that reflect the realities of classroom practice.



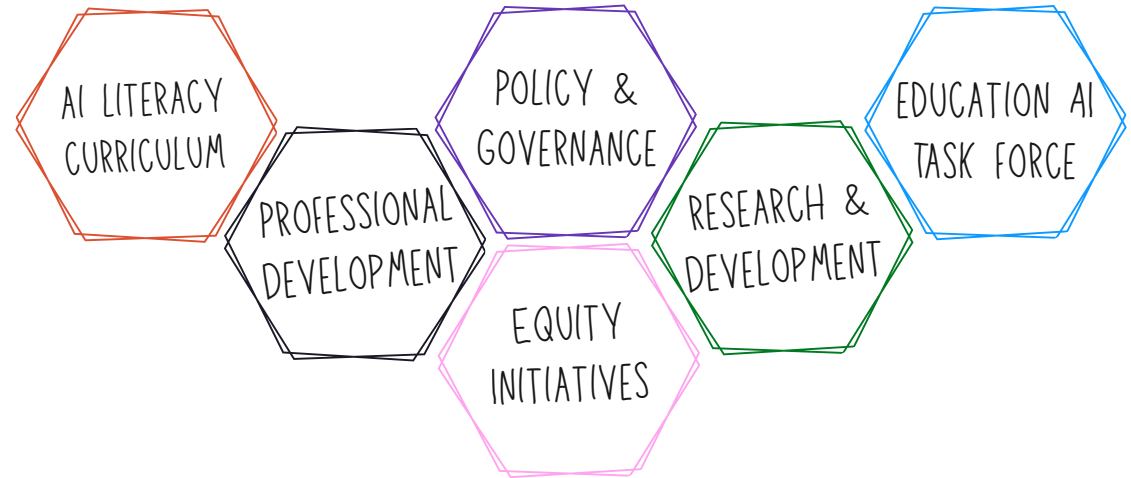
Both research and field perspectives stress that AI policies must be living documents. Rather than striving for permanence, policies should be adopted for limited timeframes, such as a single school year, and revisited regularly as new research and tools emerge (Smith et al., 2025). Blanket bans are neither realistic nor equitable, as students with access to unrestricted devices outside school will continue using AI regardless of school restrictions. Instead, nuanced guidelines should be created through inclusive processes that bring together teachers, administrators, students, parents, and skeptics. Importantly, these policies should be grounded in ethical considerations, explicitly addressing transparency, fairness, responsibility, privacy, and beneficence. They must also be adaptable, recognizing that AI capabilities are frequently added to commonly used educational software without notice.

Teacher capacity is central to managing both the opportunities and risks of AI in classrooms. Teachers require sustained professional learning to develop AI literacy, including how to recognize bias, misinformation, and low-quality outputs, and how to design prompts that support learning without outsourcing critical thinking. Instruction must be structured to counteract cognitive offloading, which occurs when students rely too heavily on AI tools to perform tasks that would otherwise foster analysis, evaluation, and problem solving. Evidence shows that frequent AI reliance can weaken critical thinking with effect sizes larger, and more negative, than many instructional interventions (Oregon Department of Education, 2025). To mitigate this,

schools should prioritize pedagogical strategies which help preserve productive struggle and creativity. Teachers can further model appropriate AI use by demonstrating information literacy skills and engaging students in activities that require questioning, evaluation, and the testing of AI outputs against diverse sources.

Equity must remain at the forefront of both policy and practice. Districts should ensure that AI tools do not reinforce bias or exacerbate disparities in access to high-quality learning opportunities. At the same time, AI should be deployed strategically to support multilingual learners, students with special needs, and others who benefit from differentiated instruction and accessible design. Schools must also remain attentive to the environmental and labor implications of AI adoption, acknowledging the energy-intensive nature of large-scale computing and the conditions under which these systems are built.

To meet both the legislative requirements and the evolving needs of students, Illinois should pursue a comprehensive six-part strategy that provides a framework for integrating AI into the educational system. This strategy should emphasize curriculum development, sustained professional learning for educators, strong policy and governance structures, and targeted equity initiatives. By grounding this work in ethical principles and inclusive decision-making, Illinois can ensure that all students develop the critical thinking, ethical awareness, and practical skills required to thrive in an AI-powered world. Implementing these recommendations will position Illinois as a leader in educational innovation, equipping its students to become informed citizens and successful contributors to the future workforce.



LIVING DOCUMENTS AND WORK THAT REPRESENT THE EVOLVING AND CHANGING LANDSCAPE OF AN EDUCATIONAL WORLD WITH AI.

IN CONCLUSION

The time to act is now. Our state's future depends on it. While Illinois has made progress, we are still lagging behind our neighbors, and our students are missing key opportunities. Data shows that only 60% of our high schools are able to meet the law requiring them to offer a foundational CS course, and a mere 7.4% of high school students enroll in one. This isn't just a matter of falling behind; it's a matter of equity and economic competitiveness. Students in rural Illinois are significantly less likely to have access to CS learning than their suburban or urban peers, and yet disparities between suburbanites and urban students still exist. Meanwhile, the very nature of human work is being fundamentally altered by AI, and technologies are happening to us faster than we even know how to properly use them. We must stop treating computer science as a "nice-to-have" elective and recognize it as the backbone of every modern industry and innovation.

This State Plan is more than a list of recommendations; it's a blueprint for action. To our policymakers, community leaders, and residents, the urgency is clear: we cannot wait. We must proactively build a future that we want for our children, our communities and our state. This plan outlines a strategic, six-part framework to build a sustainable and equitable CS and AI education ecosystem. We must fund this plan equitably, with a needs-based model that prioritizes rural and underserved districts; strengthen teacher preparation, by creating flexible credentialing pathways and a permanent state-level director of CS education; establish clear learning pathways from kindergarten through high school, including a graduation requirement to ensure universal access; expand outreach and partnerships to provide out-of-school learning opportunities; use data and research to guide our decisions with a new public data portal; and provide clear guidance on AI to build a competent, ethical, and empathetic society. We have a choice: to react to a future that is happening to us, or to actively shape it. Let's make this plan a reality and secure Illinois's position as a leader in the digital age and ensure that our students will become computationally literate and empowered citizens.

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Revision History

2025.10.07 Spelilings and typos