National Girls Collaborative Project

NGCP







Building AI Literacy for Inclusion in STEM

A National Landscape Study of K–12 Educators

Executive Summary

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PARTNERS

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Artificial intelligence (AI) is reshaping how young people learn, play, and prepare for future careers. Yet the education field still lacks a clear picture of how prepared educators are to guide them. With support from the AMD Foundation, the National Girls Collaborative Project (NGCP), in partnership with Ingenia Learning and STEM Next Opportunity Fund, launched *Building AI Literacy for Inclusion in STEM* to examine the current state of AI literacy across formal and informal K-12 learning environments. The study focused on the barriers educators face and the opportunities to expand equitable access.

This report presents findings from the initiative's national landscape study, launched in January 2026. The study used a mixed-methods design that combined a national survey of 552 education professionals working in formal K-12 and out-of-school time (OST) programs with eight focus groups involving 47 education professionals. Together, these findings show how educators currently use AI, what limits their adoption, what support they need, and how they view young people's readiness to engage with AI.

BACKGROUND

The goal of *Building AI Literacy for Inclusion in STEM* is to better understand the current state of AI literacy across formal and informal K-12 learning environments — engaging educators, youth program leaders, and education networks nationally to examine how AI is being introduced, where gaps and challenges exist, and what support educators need to expand equitable access to AI learning for all young people. A draft strategy framework guided the initiative; this landscape study was designed to surface the gaps, barriers, opportunities, and promising practices that would inform it.

Using a comprehensive national survey and semi-structured focus groups, the landscape study explored six research questions:

- What do educators and youth currently know and understand about AI?
- What AI-related teaching practices, tools, and curricula are already in use?
- Where are the biggest gaps in knowledge, confidence, resources, and access?
- What concerns, motivations, or perceptions shape how AI is introduced to youth?
- How is AI currently positioned within existing STEM and computing priorities?
- What opportunities exist to build equitable and culturally responsive pathways into AI literacy?

METHODOLOGY

The study used a mixed-methods design. A quantitative landscape survey identified broad trends and systemic patterns across a geographically diverse sample of educators; semi-structured focus groups captured lived experience and added depth to the survey findings. The survey was developed between January and March 2026, drawing on existing instruments from STEM Next Opportunity Fund, RAND, and Youngstown State University alongside newly developed items, and underwent internal and external review—including from project funders, partners, and Advisory Board members—before launch.

The survey went live publicly on March 27, 2026, in recognition of National AI Literacy Day, and remained open through May 2026—nine weeks in total. Distribution ran through NGCP's electronic mailing lists, social media, and national newsletter, amplified through NGCP Collaborative regional networks, STEM Next Opportunity Fund, project partners, Advisory Board members, snowball sharing, and a targeted research panel (Centiment) to strengthen geographic representation. The survey drew 589 responses; after removing incomplete or low-quality submissions, 552 responses formed the final analytic sample.

Ten 60-minute semi-structured focus groups of five to seven participants each were conducted over Zoom, each facilitated by two to three researchers. After a data-cleaning process to verify participants' professional credentials and sufficiency of participation, eight of the original ten sessions—representing 47 educators—were retained for analysis. Quantitative differences across demographic groups, training levels, organization types, and professional roles were tested using chi-square tests at a significance level of $p < .05$; focus group data were analyzed through a multi-step thematic coding process.

WHO RESPONDED

Respondents were predominantly women (76%) and identified largely as White (69%), Black or African American (18%), or Hispanic/Latino (11%). Most worked in formal K–12 education (76%, including 61% public school), with 16% in OST programs; 74% identified their primary role as K–12 educator. Respondents served all grade bands (52% elementary, 43% middle/junior high, 42% high school) and represented every U.S. region, led by the South (33%) and Northeast (26%). More than a third (37%) had worked in their current role for 20 years or more.



WHAT WE LEARNED: CURRENT USE AND COMFORT

AI use is already common, but most applications remain practical. About two-thirds of educators (67%) use AI at least several times each week in their professional lives, and 71% do so at least several times weekly in their personal lives. Chatbots are by far the most common tool, used by 87% of respondents, followed by virtual assistants (49%) and AI writing assistants (37%); adaptive learning systems (29%), image generators (28%), and research assistants (16%) trail behind. For most educators, AI has become a practical resource for finding quick answers (77% at least weekly) and completing administrative tasks—far more than for supporting strategic goals, where only 44% use it weekly or more and 27% report never using it that way.

Comfort with AI is uneven, and it drops sharply for youth-facing and technical tasks. More than half of respondents feel very or extremely comfortable assessing the quality of AI-generated results (56%) or creating useful prompts (52%), and half feel that comfortable helping youth think critically about AI (50%). By contrast, educators are far less confident with more specialized tasks: 28% are not at all comfortable teaching youth how AI systems are trained, 24% are not at all comfortable identifying how AI is used in specific STEM careers, and 23% are not at all comfortable teaching the differences between AI, machine learning, and data.

KEY DEMOGRAPHIC DIFFERENCES: USE AND COMFORT

- Technology educators report the highest AI use overall; elementary educators report significantly lower use of specific AI tools than middle and high school educators.
- Men report more frequent AI use than women in both personal life (68% vs. 45% at least once a day) and professional life (57% vs. 42%).
- Men are also significantly more comfortable than women with several AI-related teaching tasks, including introducing AI to youth (44% vs. 22% extremely comfortable).
- Mid-career educators (5–10 years of experience) report the highest comfort across AI-related teaching tasks; veteran educators (20+ years) report the lowest.



WHAT'S HOLDING EDUCATORS BACK

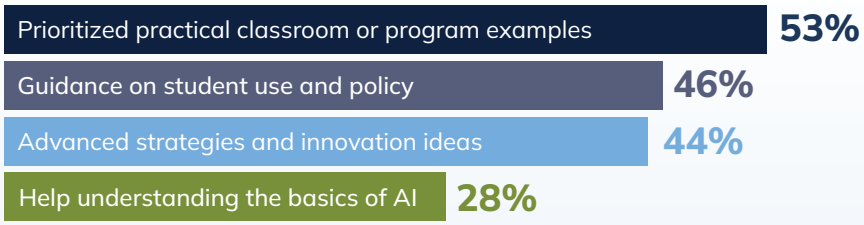
Ethical concerns, privacy issues, and limited institutional support continue to slow AI adoption. The most frequently cited barriers were concerns about student misuse of AI (42%), data privacy (38%), and AI's broader role in society (37%). Roughly a third also cited a lack of professional development for using AI tools (31%), concerns about potential bias (30%), a lack of school, district, or organizational guidance (28%), and concerns that AI use could diminish student-teacher relationships (28%). Educators were least likely to say that available AI tools simply don't support their instruction (14%) or that a lack of technology access is holding them back (14%)—the barriers are much more about guidance, trust, and preparation than about the tools themselves.

> **"One of the barriers that our organization is facing is that we don't have an AI governance policy."**
>
> —FOCUS GROUP EDUCATOR

TRAINING GAPS AND WHAT EDUCATORS WANT

Access to AI-related professional development remains limited. More than a third of respondents (37%) have received no AI-related training at all in their current role; another 30% have had two hours or less, and only 11% have received more than eight hours. The gap in outcomes tied to that training is striking: educators with more than eight hours of AI-related professional development were more than four times as likely to use AI frequently as those with none (74% vs. 16%), and reported significantly greater confidence teaching AI-related concepts.

When asked what would help most, educators prioritized practical classroom or program examples (53%), guidance on student use and policy (46%), and advanced strategies and innovation ideas (44%) well ahead of help understanding the basics of AI (28%)—a signal that most educators have moved past needing an introduction and are asking for applied, real-world support. Desired outcomes centered on efficiency (saving time, 59%; improving the quality of work, 49%), but a meaningful share also prioritized student-centered goals: improving student outcomes (40%), preparing youth for future careers (39%), and building youth AI literacy (32%).



HOW EDUCATORS SEE YOUTH AND AI

Young people's enthusiasm for AI is outpacing their understanding of it. Educators consistently described students as curious about AI and eager to experiment with new tools—nearly three-quarters rated youth interest in AI as moderately or very high. Far fewer rated youth AI literacy that highly: only about a third, while one in five described it as very low. Focus group participants often described young people as confident users of AI tools but noted that many lacked the critical thinking, conceptual understanding, and ethical awareness needed to use those tools productively and responsibly.

"I see more of reliance [on AI]... Now, AI is found almost on every web page, and when they use it, I don't think they use it smartly."

—FOCUS GROUP EDUCATOR

"Letting them understand that it's not everything they get from AI that they would submit... you should be able to cross-check, to go [through] whatever information you have gotten from AI, and be able to break it down, narrow it down, and filter it."

—FOCUS GROUP EDUCATOR

EFFECTIVE PRACTICES ALREADY UNDERWAY

About half of respondents shared a specific task, activity, or practice they had found effective in their professional role—most often related to lesson planning, content creation, and student assessment. Overall sentiment was positive: most educators described AI as helpful for streamlining tasks and enhancing productivity, while a smaller share raised concerns about AI's societal impacts or expressed reluctance to use it. Several focus group participants described AI less as a tool for completing tasks and more as an emerging "thought partner" that helps with lesson planning, differentiation, and idea generation.

"One thing that I've seen that's been kind of a cool way with AI is showing students pathways and careers and giving them advice on what they could potentially do in the future."

—FOCUS GROUP EDUCATOR

WHERE THE GAPS ARE WIDEST

By Amount of AI-Related Training

AI-related professional development is closely associated with how respondents use, understand, and envision AI in educational settings. Respondents with more training reported greater AI use, higher comfort with AI-related tasks, and stronger perceptions of youth interest and readiness—for example, those with more than eight hours of training were significantly more likely than all other groups to use AI almost constantly (29% vs. 5–12%). In contrast, respondents with less or no training were more likely to identify foundational knowledge, professional development, and practical implementation support as ongoing needs, and were more likely to cite lack of professional development itself as a barrier (38% of untrained respondents, compared with 11% of those with more than eight hours).

By Organization Type and Professional Role

Interest in AI was evident across both K–12 and OST settings, but experiences, concerns, and support needs varied meaningfully by organization type and role. K–12 respondents—particularly those in private and charter settings—reported more frequent AI use, greater comfort with AI-related tasks, and more AI-related professional development than OST respondents. OST respondents reported lower levels of use and training and stronger concerns about privacy, bias, autonomy, and AI's broader role in society, alongside stronger interest in youth-centered priorities such as STEM learning, ethics, and career pathways.

Community-based OST (CBO-based) programs stand out as the least-resourced group in the study. Nearly half of OST respondents (49%) reported receiving no AI-related training at all, compared with 37% of the full sample, and half of OST respondents reported never using AI to help with specific strategic goals, compared with 27% of the full sample. CBO-based OST respondents were also significantly more likely than K–12 respondents in every setting to report concerns about AI's role in society, data privacy, bias, and reduced autonomy—the clearest pattern of compounding disadvantage in the dataset.

OST VS. FULL SAMPLE: SELECTED GAPS

- 49% of OST respondents report zero AI-related training, vs. 37% of the full sample.
- 50% of OST respondents never use AI for specific strategic goals, vs. 27% of the full sample.
- OST program directors are significantly more likely than K–12 educators to report no AI-related professional development at all (54% vs. 34%).







KEY FINDINGS

1. AI use is already common among education professionals, but it remains largely practical and task-oriented.

Most respondents use AI regularly for finding information, managing administrative responsibilities, and generating content. Although adoption is widespread, educators rely on it mainly to improve efficiency and productivity rather than to support more strategic or transformative work, and many are still developing foundational AI knowledge.

2. AI-related professional development is strongly associated with confidence, use, and readiness to teach AI concepts.

Professional learning plays a critical role in helping education professionals move from awareness and experimentation to confident, purposeful, student-centered AI use, and in strengthening their ability to teach more advanced topics.

3. Ethical concerns, privacy issues, and limited institutional support continue to slow AI adoption.

The most frequently cited barriers were concerns about student misuse, data privacy, AI's broader societal impact, potential bias, limited professional development, and unclear school or organizational guidance.

4. Education professionals are seeking practical, hands-on implementation support rather than introductory information about AI.

The most requested forms of support are real-world classroom and program examples, guidance on student use and AI policies, and advanced implementation strategies—not another AI 101.

5. Meaningful equity and access gaps exist across types of education professionals and learning environments.

Education professionals working in OST programs, elementary educators, women respondents, and those with limited AI training consistently reported lower levels of AI use and confidence than other groups.

6. Youth interest in AI is high, but AI literacy and critical understanding remain limited.

Educators consistently reported strong youth interest in AI alongside much lower ratings of students' understanding of AI concepts, AI literacy, and responsible AI use—pointing to a significant opportunity for intentional AI literacy programming.

LIMITATIONS

While this landscape study provides valuable insights into the current state of K–12 AI literacy, several limitations should be considered when interpreting the results. First, although the overall sample size was robust, a larger and more expansive participant pool would allow for deeper regional and demographic cross-analyses. Second, the reliance on organic network outreach and self-selection introduced a potential response bias, as educators who chose to participate may have had a higher baseline interest in or motivation toward AI technologies than the general educator population. Finally, the final sample contained a disproportionate representation of formal K–12 classroom teachers compared with informal and OST educators; the findings may therefore more closely reflect traditional schooling environments than the full ecosystem of youth K–12 STEM learning.

RECOMMENDATIONS TO THE FIELD

No single organization can close AI literacy gaps alone. Schools, districts, OST programs, professional learning providers, researchers, funders, and policymakers all have a role to play. Drawing on the evidence from this study, the report offers six recommendations:

1. Invest in sustained, tiered AI professional development for educators.

Training made a bigger difference than any other factor in this study: educators with more than eight hours of professional development were more than four times as likely to use AI frequently as those with none (74% vs. 16%). Reserve introductory "AI basics" for those with little or no prior exposure; everyone else is asking for practical classroom examples, guidance on responsible use and policy, and applications of AI in STEM learning—delivered through the formats educators prefer: coaching, peer exchange, and applied workshops.

2. Develop clear AI guidance, policies, and decision-making tools for education settings.

Educators need practical guidance on appropriate AI use with youth, data privacy, student misuse, bias, and ethics—including a gap this study documented, where AI use is more restricted for youth than for staff (35% of educators report several restrictions on youth use, vs. 21% for staff). Adaptable policy templates and decision trees can help calibrate youth access rather than uniformly restricting it.

3. Prioritize equity-focused supports for lower-access groups and settings.

Targeted investments should focus on CBO-based OST programs, elementary educators, women educators, and educators with limited AI training, through stipends, accessible professional learning formats, peer learning cohorts, curated resources, and implementation assistance tailored to informal and early-grade settings.

4. Create practical, youth-centered AI literacy resources that support formal and informal STEM learning, future readiness, and responsible AI use.

Educators want classroom and program examples (reported by 53%), not just conceptual guidance. Resource development should build in youth input through co-design, pilot testing, and usability studies, so young people can not only use AI tools but question them and help shape how they are used.

5. Build a shared field-wide learning network to surface promising practices and reduce isolation.

Many educators are currently learning about AI on their own or through informal conversations with colleagues. Schools, districts, OST organizations, and professional learning networks should create structured opportunities to exchange lesson ideas, compare policies, and work through implementation challenges across settings—with room made for elementary and community-based OST educators, whose experiences are often missing from AI initiatives.

6. Advance research to fill remaining evidence gaps and inform future practice.

Future research should pick up where this study's limitations leave off: larger, more geographically representative samples; deeper representation of OST and informal learning environments; reduced reliance on self-selected participants; and longitudinal research examining how AI knowledge, instructional practice, and professional learning needs evolve over time.



CALL TO COLLECTIVE ACTION

AI is no longer a future consideration; it is actively transforming how young people learn, play, and prepare for tomorrow's workforce. Overcoming systemic barriers to AI literacy demands collective action across schools, districts, OST networks, and research communities. The findings from this study suggest that meaningful progress will depend on supporting educators through professional learning, providing practical resources, establishing clear guidance, and creating collaborative networks, while maintaining a strong focus on equity and responsible use. Continued investment in educators, evidence-informed resources, and collaborative partnerships can help ensure that all young people have opportunities to develop the knowledge and skills needed to engage with AI thoughtfully, responsibly, and confidently.

This landscape study is the first phase of the Building AI Literacy for Inclusion in STEM initiative. The full report, including detailed survey data, focus group themes, demographic breakdowns, and the complete survey instrument, is available on the National Girls Collaborative Project website.

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