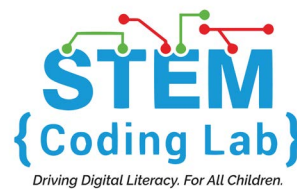


STEM Coding Lab Partners with Quill.org to Equip Students for an AI-Powered Future



Pittsburgh, PA
stemcodinglab.org

Challenges & Goals



Help teach students about AI, its future impact on society, and career paths



Support students who might not otherwise have access to technology education



Learn more about the needs of students attending under-resourced schools

Implementation

- ✓ 8th-grade students in Sto-Rox Junior High School in McKees Rocks, and Brookline PreK-8 in Allegheny County, PA
- ✓ During weekly in-class computer science time, students completed Quill's "Building AI Knowledge" activity, which teaches about AI's impact on society
- ✓ Students were asked for evidence to support, oppose, and/or show the consequences of a text's claims

Results

Quill's feedback encouraged students to be precise, logical, and evidence-based while writing a grammatically sound sentence.



95% of students

said they learned something new.



91% of students

found Quill's feedback to be either always helpful or sometimes helpful when revising their sentences.

Learnings

- ✓ Front-load article topics to boost student engagement and performance.
- ✓ Shorter, more frequent Quill practice increases activity completion.
- ✓ Provide literacy support to help students engage with Quill's texts.



THE CHALLENGE

Bringing AI Literacy to Life for STEM Coding Lab Students

In 2024, STEM Coding Lab was interested in further deepening 8th-grade students' engagement in relevant AI topics that best serve their community of students. As a nonprofit program founded to specifically support children who might not otherwise have access to technology education by providing the skills needed to succeed in the digital economy, the STEM Coding Lab team partnered with Quill.org to deepen their offerings and impact.

THE SOLUTION

A Mission-Aligned Partnership for Building AI Literacy Using Quill's Curriculum

While Quill's literacy tools primarily serve English language arts classrooms, its new *Building AI Knowledge* instructional offering features activities to teach students about AI's impact on society. Designed for 8th-12th grade students in ELA or STEM classrooms, the instructional modules look at how AI impacts society, including the future of work and education.

A natural complement emerged between the Quill's Building AI Knowledge activities and STEM Coding Lab's mission to increase students' digital literacy and understanding. The two organizations partnered in 2024 to assess how Quill's content best serves 8th-grade students through STEM Coding Lab's weekly in-class computer science curriculum.

Goals for the STEM Coding Lab & Quill Collaboration

Together, Quill and STEM Coding Lab determined the following goals for this partnership:

- ✓ The Quill team will learn more about the needs of students attending under-resourced schools in Allegheny County, Pennsylvania.
- ✓ The STEM Coding Lab team will use Quill materials to help teach students about AI, its future impact on society, and career paths.

With STEM Coding Lab's support, the Quill team will evaluate the fidelity of Quill's Building AI Knowledge activities when paired with STEM Coding Lab's 8th-grade curriculum and relevant sections of the organization's broader suite of computer science lesson plans.

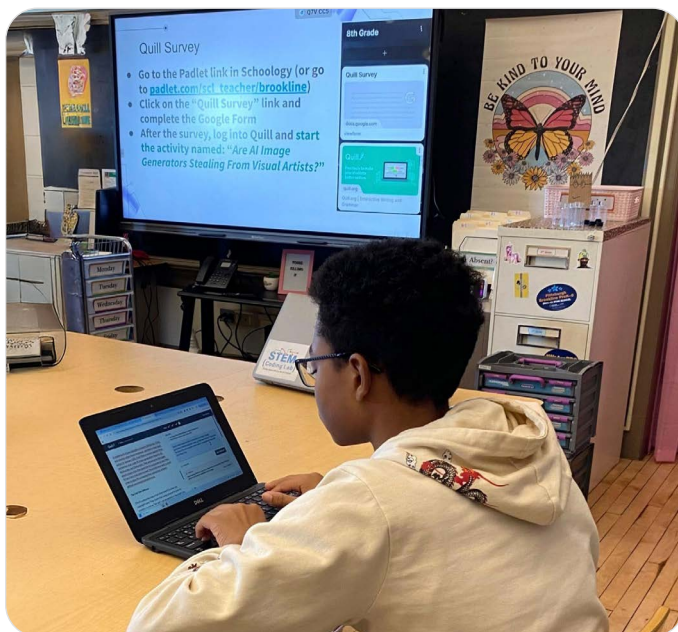
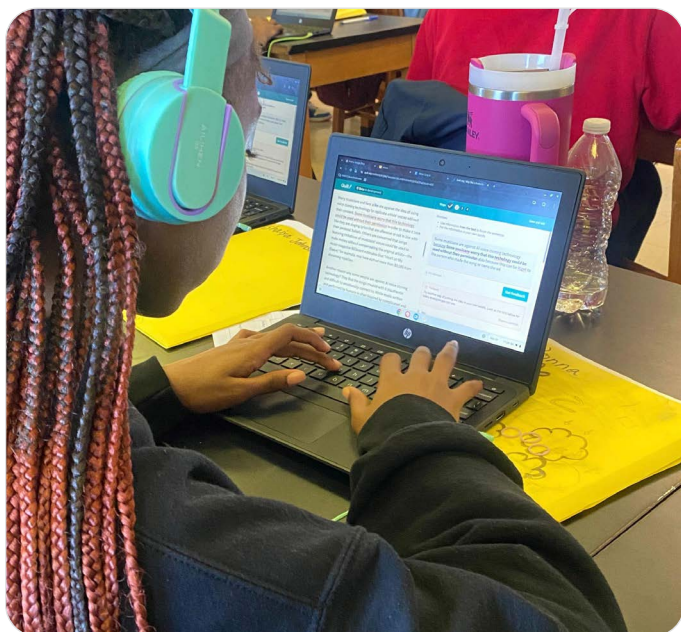


THE IMPLEMENTATION

Strategic Rollout Across Two Pennsylvania Schools

The STEM Coding Lab leadership team identified two school programs to implement Quill to support the 8th-grade STEM Coding Lab curriculum: Sto-Rox Junior High School in McKees Rocks and Brookline PreK-8 in Pittsburgh.

Throughout the 2024-25 school year, the Quill team worked with STEM Coding Lab instructors to strategically embed Quill activities into their lessons, supplementing students' growing knowledge of AI and its impact on society.



Together, Quill and STEM Coding Lab established partnership milestones to share continuous feedback on Quill's content, track student progress, and identify needs for support in the STEM Coding Lab classrooms.

KEY MILESTONES INCLUDED

- ✓ A customized virtual Quill onboarding session for STEM Coding Lab instructors and leadership
- ✓ A site visit from Quill's Director of Partner Success to the Sto-Rox 8th grade classes to support day one Quill usage
- ✓ Monthly meetings between Quill and STEM Coding Lab team members to hear feedback on implementation, define areas of support needed, and share implementation ideas
- ✓ Interviews with key STEM Coding Lab instructors and digital surveys of participating students

THE RESULT

Students Built Real-World AI Knowledge —and Backed It with Evidence

A six-month collaboration between Quill and STEM Coding Lab shows how powerful it is to build background knowledge in AI topics to increase students' digital literacy and understanding. Mr. Moody, Program Instructor, stated that while making various AI topics relatable to students was a challenge initially, "what Quill brought to the table...helped immensely because it gave me a starting point to pivot [from] and saved me time." The Quill team is excited to continue expanding its interdisciplinary science content to support more teachers and students in building essential background knowledge and strengthening writing skills.

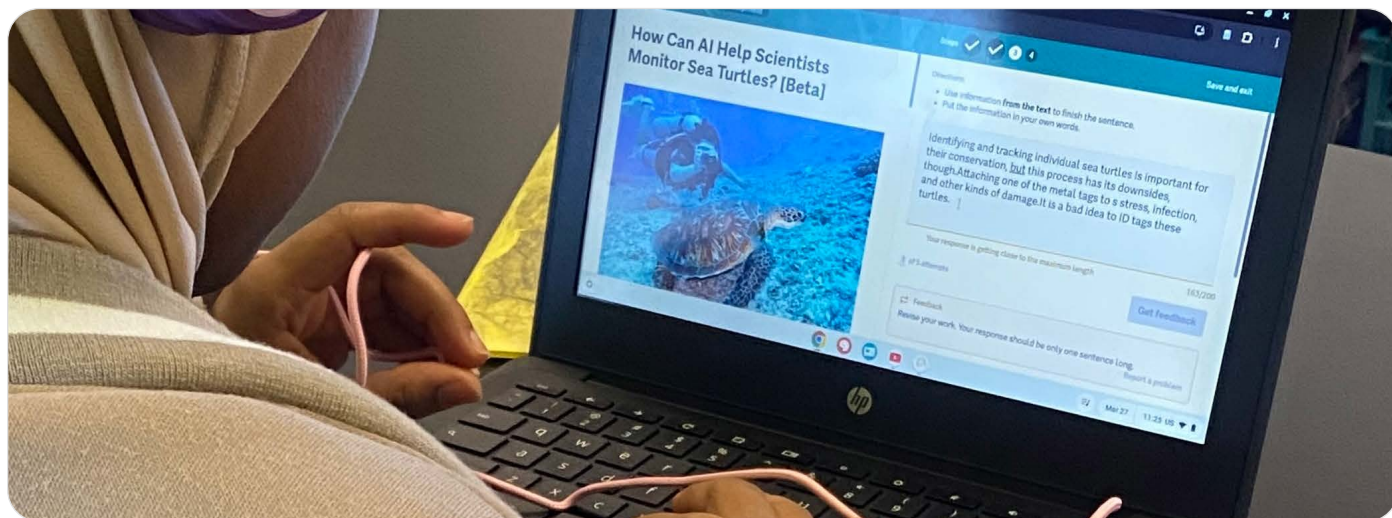
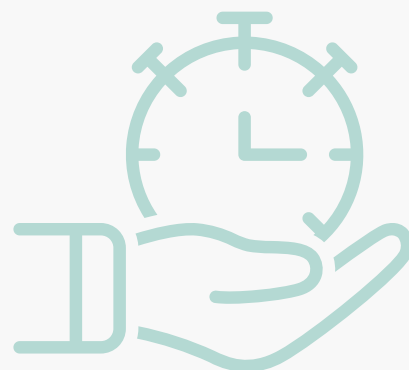
On average, each 8th-grade student at Sto-Rox and Brookline constructed nine different claims about AI's impact on society. Students used evidence to support, oppose, and show the consequences of these claims. Quill's feedback encouraged students to be precise, logical, and evidence-based in their responses while writing a grammatically sound sentence.

Let's follow a student's thinking and learning on one of the activities: "[How Can Computer Vision Protect Elephants from Poachers?](#)" In this activity, students read a text that explores how TrailGuard uses computer vision to protect wild elephants from poachers, while also investigating the limits of this technology.

“

What Quill brought to the table...helped immensely because it gave me a starting point to pivot [from] and saved me time.”

Mr. Moody
Program Instructor



Student A used Quill's feedback to provide reasoning to support the given claim, twice adding more details to their sentence to show their nuanced understanding of this topic.¹



Quill

Use evidence from the text to support this claim:

The TrailGuard computer vision camera can accurately identify poachers because...

The TrailGuard computer vision camera can accurately identify poachers because... when it detects motion, it is able to identify whether it is an animal or human.



Student A



Quill

Try clearing your response and starting again. Instead of focusing on facts about the TrailGuard camera, write about how engineers developed the computer vision system. What did engineers use to train the TrailGuard computer vision system?

The TrailGuard computer vision camera can accurately identify poachers because... engineers updated the system's data set with more images to catch more poachers.



Student A



Quill

Keep revising! Try to be even more specific. Why do engineers continually update the TrailGuard computer vision system with more images? Read the highlighted text for ideas.

CETI needs a large amount of data to effectively train its large language models because...
engineers updated the system's data set with more images to distinguish the difference between animals and humans.



Student A



Quill

Nice work! You used information from the text to explain why the TrailGuard computer vision camera can accurately identify poachers.

¹ The images shown of Quill's Reading for Evidence activities have been formatted for easy viewing. To explore Reading for Evidence, or any other tool, visit [Quill.org](https://quill.org) to create a free account and access the full content library.

Student A then showed they can support an opposing viewpoint with evidence from the article, stretching their mind to consider the complexities of AI use in animal conservation. The student now needed only one round of feedback to write a strong, evidence-based response.



Use evidence from the text to support this claim:
The TrailGuard computer vision camera can accurately identify poachers but...

The TrailGuard computer vision camera can accurately identify poachers but... some critics, however, argue that the security system doesn't address the root causes of the poaching problem.



Student A



That's true! Now add more specific information to your response. What is one of the main reasons behind the elephant poaching problem?

The TrailGuard computer vision camera can accurately identify poachers but... but some critics, however, argue that the security system doesn't address the root causes of the poaching problem which is that the demand for elephant ivory is high in some countries.



Student A



Nice work! You used information from the text to show a contrasting or surprising idea about the TrailGuard computer vision camera's ability to accurately identify poachers.

Students were asked to reflect on their learning experience at the midpoint and end of the year. When asked, "After working on the Quill activities, how much do you feel you've learned about AI?"



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The final survey also asked students to synthesize their growing AI content knowledge by explaining if they believe AI is more beneficial or harmful to society. Many students provided nuanced answers, many drawing from the Quill article topics. Some highlights include:

- “I believe it has its pros and cons, but I feel it depends more on the situation. Like it helps getting information quicker and more efficient[ly] with less human errors and work. But on the other hand, when it is used for things like pictures and videos, it can be more complicated ...”
- “We can live without it. I mean, some people do. I don't really agree with AI, but it depends on what... I mean, as an artist, I don't agree with the generative art or generative stories. I mean, write your own story, draw your own art! It's good to get some ideas or references, but as an author and an artist, it upsets me so much...”
- “It seems AI offers substantial benefits to society, particularly in education.”



THE TAKEAWAY

Three Best Practices for Implementing Quill's AI Literacy Program

Through the STEM Coding Lab team's ongoing feedback sharing and on-the-ground observations, the Quill team gathered key learnings to better support this special type of implementation in the future.

#1. Front-loading article topics boosts student engagement and performance.

The STEM Coding Lab instructors found that students were most engaged when they led a discussion about the article's topic before students began the respective Quill activity. To support this informational front-loading, the instructors adapted the paired slides from Quill's content partner, [aiEDU](#), to hold short discussions or pose questions. This practice helped students build background knowledge and connect to the Quill article, enabling them to approach the activity's writing prompts with confidence and engagement.

For example, at Brookline, before students began the "[Should AI Be Allowed to Clone Musicians' Voices?](#)" activity, STEM Coding Lab Instructor Eric Kress discussed AI voice cloning and played a song mentioned in the article for students. Students then wrote optimal responses on at least two of the three prompts, which was the highest performance out of all six activities students encountered.

#2. Shorter, more frequent Quill practice increases activity completion.

Quill's Reading for Evidence activities are designed to take students between 15-20 minutes to complete. Some external challenges for the STEM Coding Lab instructors, such as navigating laptop setup and login within a short class period, and other curricular priorities, limited students' time working on their Quill activities. By trying different class time implementation strategies, instructors noted that chunking the Quill practice time into 10-minute increments or spreading one activity over two class periods helped more students complete all three writing prompts.

#3. A variety of literacy supports help all students engage with Quill's texts.

The STEM Coding Lab team reported that students' reading proficiency is, on average, below the 8th-grade level. Because Quill's Reading for Evidence texts are written for students at an 8th-grade reading level or higher, it was important for instructors and students to have options to provide literacy support. Some of these supports included building time for a whole-class read-aloud of the activity's article before students work independently.

About STEM Coding Lab

STEM Coding Lab is a Pennsylvania-based non-profit with a valuable mission: to provide K-8 children with the skills needed to succeed in a digital economy. In their words, the organization aims to "equip students with the skills needed to be creators, rather than just users, of technology."

STEM Coding Lab states the facts clearly and urgently: less than 10% of K-8 youth in Pennsylvania have access to foundational computer science courses, yet 93% of middle-income jobs in America require digital literacy. The learning gap is vast, and STEM Coding Lab is working hard to close it by impacting 4,500 students annually.

About Quill.org

Quill.org, a national non-profit, is tackling a critical issue. Recognizing that poor writing skills are a formidable barrier to college and career success, Quill's mission is to help students become strong writers, readers, and critical thinkers. Over 11 million students have used Quill to sharpen their literacy skills through feedback on over 3 billion sentences.

Quill's latest literacy tool, Quill Reading for Evidence, explicitly engages 8th-12th grade students in writing to learn by encouraging reasoning and text-based analysis while AI-powered feedback coaches them to strengthen their written ideas and build their content knowledge about ELA, Social Studies, and STEM topics.

[Learn More](#)

