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## Curiosity x Design: Centering Children's Curiosity in the Age of AI

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*“If we want people to value curiosity, it’s going to require a shift in how they think about what’s most important in education. Curiosity is really important if we want to have a democratic, pluralistic society. What are the things we need to do to change education to support a democratic pluralistic society? That’s the big question.”*

– Mitch Resnick, LEGO Papert Professor of Learning Research at MIT, Founder & Board Chair of Scratch

*“As adults, we have to play together and cultivate curiosity within ourselves. Naturally, we become champions, and then curiosity hopefully ripples out.”*

– Errol King, Co-Founder & Chief Imagination Officer at Innergalactic

*“The good thing is... we are all born with an abundance of curiosity.”*

– Andreas Schleicher, Director for Education and Skills at the Organisation for Economic Co-operation and Development (OECD)

*“Time is an important policy lever to embed curiosity into teaching and learning systems.”*

– James Choi, Senior Specialist at the 21st Century Competencies Office at the Singapore Ministry of Education

*“Can curiosity can be a coping mechanism that people cultivate in response to something challenging?”*

– Daphna Shohamy, Neuroscientist and Professor, Department of Psychology and the Zuckerman Mind, Brain, Behavior Institute at Columbia University

*“We shouldn't think about curiosity as being an individualistic idea, but rather one in community.”*

– Kylie Pepler, Professor of Informatics and Professor of Education at University of California, Irvine

# 1. Introduction

In October of 2025, the Scratch Foundation, alongside the Organisation for Economic Co-operation and Development (OECD) and Stanford University researchers Bruce McCandliss<sup>1</sup> and Nick Haber<sup>2</sup>, hosted the first-ever Curiosity Convening, a global gathering focused on one big question: What becomes possible when curiosity leads learning?

Bringing together leading voices from neuroscience, AI, developmental psychology, education, and design, the convening explored how curiosity can help young people thrive in a fast-changing, tech-driven world. Together, researchers, educators, and policymakers exchanged ideas, shared insights, and surfaced new strategies for designing learning experiences that center children's curiosity by sparking questions and fueling creative exploration.



Scratch, the world's largest digital creative community for kids, served as a living example of curiosity in action. Every day, millions of young people around the world use Scratch to stretch their imaginations through self-expression and global conversation. By examining how learners engage with Scratch, we can better understand how curiosity, agency, and play drive meaningful academic and emotional growth.

The following report captures what we're learning from research and real-world practice. It summarizes why curiosity matters more than ever and highlights emerging evidence from across disciplines that points to its transformative potential. It also explores Scratch as a case study in curiosity-centered design, showing how one platform can inspire millions of young people to bring their curiosities to life.

For more information about the 2025 Curiosity Convening, please visit [curiosity.scratch.org](https://curiosity.scratch.org).

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<sup>1</sup> Professor, Graduate School of Education; Head of the Stanford Educational Neuroscience Initiative

<sup>2</sup> Assistant Professor, Graduate School of Education; PI of the Stanford Autonomous Agents Lab

## 2. The Need

As we look ahead, the most urgent question in education isn't how technology can make learning faster or more efficient. It's this: *What kinds of learning experiences do kids need to grow into curious, creative, and adaptable humans in a world shaped by technology?*

For decades, educators and researchers have called for a shift from rigid, standardized instruction to learning that centers creativity, critical thinking, and collaboration. Yet most school systems, especially in the United States, remain locked into outdated models that prioritize rote literacy and math over the deeper skills young people need to thrive.

The gap between what kids need and what education policy prioritizes is growing. Generation Alpha—the 2 billion children born between 2010 and 2025—will inherit a world that's more connected, automated, and unpredictable than any before. And while they spend more time on screens than any previous generation (often upwards of 9 hours a day), much of that time is in digital spaces designed to encourage passive consumption rather than active, creative exploration.

This presents an incredible opportunity.

If kids are immersed in technology, we have a responsibility to shape the digital landscape in ways that nurture their curiosity, agency, and imagination. Learning shouldn't be reduced to completing tasks or memorizing facts; it should empower young people to explore their ideas, ask meaningful questions, and create in conversation and in community with others.

That's exactly what Scratch has been doing for nearly 20 years. As a platform and a global community, Scratch invites kids to see themselves not just as users of technology, but as creators—as coders, storytellers, designers, and animators. It helps young people turn their curiosity into something they can grow and share.

In a future shaped by AI and automation, the most valuable skills won't be the ones that machines can easily do better. They'll be the human ones like curiosity, creativity, empathy, and imagination. That's the need. And that's also the opportunity.

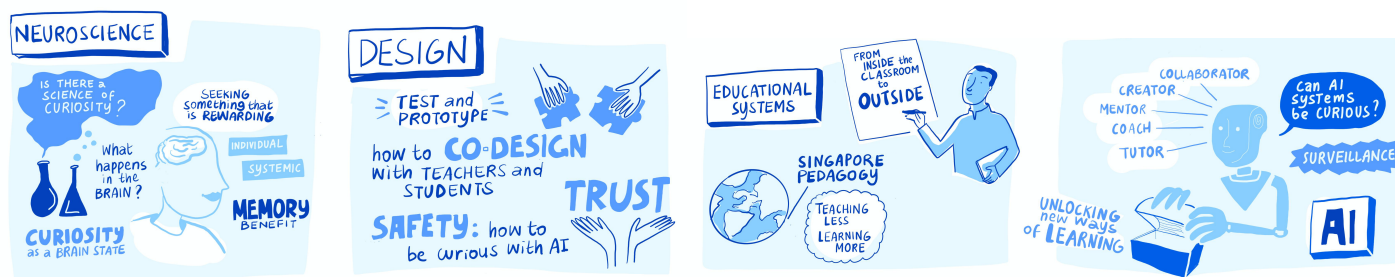


### 3. The Evidence

Decades of research in education, psychology, and neuroscience point to one clear finding: curiosity fuels learning. Studies show that when kids are intrinsically motivated—when they’re genuinely curious—they tend to learn more, remember more, and stay more engaged (Nolen, 1988; Ryan, 2020; Shah, 2018). Some researchers even describe curiosity as a “pillar of academic performance” (Von Stumm, 2011). Neuroscience backs this up, showing that curiosity activates the brain’s reward system, making it easier to retain new information (Gruber, 2014; Kang, 2009).

When it comes to STEM learning, curiosity matters a lot. Researchers like Haber, Burkholder (2021), and Wang (2024) have shown that asking “how does this work?” and reflecting on the process are key to solving complex problems. That kind of creative tinkering, often sparked by curiosity, helps build deep, lasting problem-solving skills.

As evidence for curiosity’s role in learning has grown, so has our understanding of how it works in the brain. Studies have linked curiosity to specific neural circuits related to novelty and the drive to seek out information (Cervera, 2020; Monosov, 2024). Research also shows how curiosity connects to the brain’s reward system, helping explain why it feels so satisfying to explore and discover (Tricoli, 2006; Blanchard, 2015; Rüterbories, 2024).



Researchers are increasingly exploring how to embed curiosity in AI systems, drawing on models inspired by child development (Schmidhuber, 2010; Oudeyer, 2007). Advances in deep reinforcement learning and self-supervised learning have enabled AI agents to explore virtual environments with intrinsic motivation (Mnih, 2015; Burda, 2018; Pathak, 2017). Building on this, Haber (2018) and others have developed curiosity-driven agents that learn in settings modeled on childhood development, social attention (Kim, 2020), and play (Doyle, 2023). These agents can adapt to new tasks by building internal models of their environments (Kauvar, 2023; Sekar, 2020).

We now have not only a deeper understanding of why curiosity matters for childhood learning, but also new tools to design learning experiences that build on it, especially in virtual coding environments powered by AI. Scratch offers a powerful testbed for this work. It is rich with opportunities for curiosity-driven learning (Resnick, 2017), and it’s supported by established frameworks that help us measure growth in creative and computational thinking (Brennan, 2012). If curiosity is key to learning, then the environments we create for kids need to protect and nurture it.

## 4. Creativity and Curiosity at the OECD

The OECD has taken a leading role in assessing creativity and curiosity in education through its Programme for International Student Assessment (PISA). In 2022, PISA launched its first-ever creative thinking assessment, measuring students' ability to generate, evaluate, and improve ideas across four domains: written expression, visual expression, scientific problem-solving, and social problem-solving (OECD, 2023a). Students also completed a questionnaire on curiosity, creativity beliefs, and creative self-efficacy.

Results showed top creative thinking scores in Singapore, Korea, Canada, Australia, and several European countries (OECD, 2024). Curiosity scores were strong in Ireland, Costa Rica, Australia, Singapore, and Colombia. High-performing students in creative thinking often also did well in math, reading, and science, though creative strength was not limited to academic achievement alone.

Earlier OECD research (OECD, 2021) explored how social and emotional skills relate to creativity and curiosity. Findings from the *Beyond Academic Learning* report showed that students who saw themselves as highly creative also rated themselves highly in curiosity and persistence. However, self-reported creativity and curiosity declined between ages 10 and 15, especially for girls. Students from more advantaged backgrounds consistently reported higher levels of both traits, and those engaged in the arts rated their creativity significantly higher.



The 2025 Learning in the Digital World assessment shifts the focus from passive technology use to how students engage as active, self-regulated learners—managing their thinking, motivation, and emotions—while applying computational inquiry to explore systems and solve problems (OECD, 2023b). Its interactive, open-ended design allows students to access tutorials, receive intelligent feedback, and create models or programs to demonstrate understanding. By also capturing data on students' learning processes, including emotional regulation, PISA offers new insight into how students learn—not just what they know.

To support classroom educators, the OECD is developing a free formative [assessment platform](#) to enable teachers to monitor student progress in real-time, creating a feedback loop that supports more personalized, curiosity-driven learning.

Together, these efforts reflect the OECD's commitment to embedding creativity and curiosity in global education, equipping students with the skills they need to thrive in a complex, digital world.

## 5. Scratch: A Creative (Learning) Approach to Curiosity

Scratch is a global platform where children engage with technology as creators, not just consumers. Launched in 2007 by Prof. Mitchel Resnick and the Lifelong Kindergarten group at the MIT Media Lab, Scratch is grounded in decades of research. Since becoming an independent nonprofit in 2019, the Scratch Foundation has supported millions of young people in imagining, connecting, and building together.

Now the world's largest creative coding platform for kids, Scratch has reached more than 155 million young people across every country. In 2024 alone, 21.5 million new users joined the platform. Every day, kids create over 500,000 new projects—games, stories, animations—bringing their ideas to life and showing what's possible when curiosity leads the way.



Scratch pioneered block-based coding and has influenced a global ecosystem of tools, programs, and policies, from the U.S. “Computer Science for All” initiative to the OECD’s Learning in the Digital World assessment. Scratch remains free and open source, evolving with the needs of its diverse global community.

Now, as it approaches its 20th anniversary, Scratch is entering a new phase of innovation with Scratch 4.0—a next-generation platform designed to integrate generative AI in ways that support, not replace, creative learning.

These new tools act as creative partners: sparking ideas, offering feedback, and expanding what's possible for kids to imagine and make.

What sets Scratch apart from other ed-tech tools is its focus on motivation, agency, and joy. Children start with their interests and build outward from there. Learning isn't imposed—it's discovered. This is where curiosity thrives: in a space that centers exploration, celebrates effort, and connects kids through shared creative expression.

Scratch also aligns closely with the OECD's framework for creative thinking. Kids communicate their ideas through writing (project descriptions, comments, dialogue), express themselves visually through sprites and scenes, explore scientific problem solving by testing and iterating on ideas, and engage in social problem solving through collaboration and remixing. These are the same domains evaluated in PISA's creative thinking assessment—and Scratch supports them all.

As Scratch continues to evolve, it will remain focused on equity, access, and imagination. Every child deserves the chance to create what they imagine. Scratch ensures they have the tools—and the community—to do just that.

## 6. Conclusion

Children are naturally curious. Our responsibility is to design spaces that honor and grow that curiosity.

In this report, we've explored the deep and growing body of evidence that curiosity fuels learning, strengthens motivation, and supports cognitive, social, and emotional growth. We've seen how researchers, educators, and institutions like the OECD are working to assess and elevate curiosity as a core learning competency. And we've seen how platforms like Scratch are already bringing curiosity-centered design to life at scale and around the world.

At a time when artificial intelligence is reshaping how we live, learn, and communicate, it is more urgent than ever to ask: *What will define the future of learning?* If we center curiosity, if we design with children's questions, interests, and agency in mind, we can build learning experiences that are not only more effective, but more joyful, equitable, and human.



The Curiosity Convening was a starting point: a space for new conversations, big questions, and cross-disciplinary collaboration. This report reflects that spirit and offers a vision for what's possible when we treat curiosity not as a nice-to-have, but as a foundational design principle for education in the age of AI.

Now, the work continues. Together with researchers, educators, policymakers, and young people, we can shape a future where every child has the freedom and support to think, create, and lead with curiosity.

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*"A bit of naivety is good. It enables you to be curious, driven, and excited to explore the world—something adults often forget and lose as they grow older."*

- Scratcher xamuil2

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