2,000th Member Spotlight: Justin Ballenger Helps Bring AI Into the Classroom

JANUARY 6, 2025

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Justin Ballenger, SSN's 2,000th member, is on a mission to bring the benefits of AI to classrooms everywhere, especially those in underserved communities. As the research lead for the National Science Foundation (NSF) - National Data Science Alliance (NDSA), he helps support the development of data science programs across historically Black colleges and universities. With a $500,000 grant from Google for Education and meetings with the offices of Michigan congressmembers Rep. Haley Stevens and Rep. Shri Thanedar, Ballenger is turning big ideas into tangible results. SSN spoke to Ballenger about how his work is shaping the future of education, why AI must be part of teacher training, and what's next to ensure all students can benefit from these innovations. The conversation has been edited for length and clarity.

Q&A with Justin Ballenger

What sparked your interest in focusing on AI and computer science in K-12 education?

A lot of the work I do at the Atlanta University Center and my institution intersects STEM education and equity. At Morehouse, I serve as STEM education faculty and work with the National Data Science Alliance, an NSF-funded grant aimed at developing data science academic programs on a national scale.

In my prior career as a middle school science teacher, I saw the rollout of technologies like smartboards and internet-connected classrooms. I also saw how the integration of computer science into classrooms often happened inequitably, largely depending on a school's location and resources. In my current position, I would love to develop strategies and partnerships to ensure schools in under-resourced areas have access to these technologies.

So, you believe the use of AI in classrooms is inevitable, and everyone needs to learn how to use it responsibly?

Oh yes, certainly. The adoption of generative AI has been incredibly rapid—faster than any other technology we've seen. Large language models have made AI more visible and practical, and within two years, adoption rates have already outpaced the internet's early growth. This technology is here to stay.

Industries are actively adopting AI and developing policies to integrate it into the workforce. Higher education is now fielding questions about preparing students for this shift. Similarly, we need thoughtful integration of generative AI into K-12 classrooms to enhance skills.

Early adoption comes with challenges: teachers unfamiliar with the technology may hesitate to use it, and students might exploit it for academic dishonesty. But as educators and students gain familiarity, innovative, and meaningful strategies emerge—similar to when Google became widely accessible. At the time, educators worried it would ruin learning, but it democratized access to information and helped students develop different skills. I believe generative AI will have a similar transformative impact if we act proactively—identifying promising practices, equipping teachers, and ensuring equitable access.

How does generative AI create challenges for less-resourced communities, and what are your ideas for addressing this gap?

Excellent question. There are two key things we'll likely see with generative AI. First, it's currently subsidized, and we're getting it at a low cost. Just recently, ChatGPT added tiers to the paid versions of their product ranging from $20 to $200. For the past six months, discussions I have engaged with colleagues focused on this shift—initially, access to generative AI was priced low to increase usership and train the models. As those models improve, we'll likely see a stratified pricing system for how these tools are accessed.

Second, in lower-income schools, a lot of time is spent on testing rather than innovation. Teachers are often pushed to "teach to the test," drilling students to meet minimum benchmarks. The issue with this approach is

that it doesn't keep students in what we call the "zone of proximal development"—the space where they're learning at a rate aligned with their ability. Many students capable of more rigorous work end up disengaged because they're stuck in repetitive, low-level tasks.

What we'd like to do is introduce evidence-based strategies and promising practices to these schools to promote real learning gains. In contrast, higher-resource schools often have more flexibility in scheduling, teaching methods, and access to resources like advanced computing, internet, and parental support. Generative AI has the potential to help teachers automate routine tasks and individualize instruction. This shift could move classrooms away from "teaching to the test" and toward addressing students' unique learning needs.

What motivated you to write an op-ed on *The AI Revolution in the Classroom*, and how has it been received?

An editor from *Higher Education Digest* reached out after coming across our work with the National Data Science Alliance. Most generative AI discussions focus on higher education, but K-12 spaces are crucial too. In K-12, much of the conversation is focused on how to prevent cheating, which I'm not sure is the best use of time and resources. Given the massive sea change this technology will bring to workforce skills, I felt it was really important to address this and share my perspective.

We've been hosting community listening sessions, engaging K-12 educators, and working with AI policy committees. Through these discussions, we found that about 60% of K-12 educators and over 55% of higher education instructors lack a strong understanding of generative AI's role in classrooms. Many focus on blocking it rather than leveraging its potential.

I felt it was important to contextualize generative AI and the role it plays in the current and future workforce. Teachers need training in AI use so they can effectively support students. Today's students won't just compete and collaborate with their peers in the United States—they're part of a global society. When we look at other nations and how they're integrating generative AI into classrooms, it's clear we can't afford to lag behind.

Congratulations on winning a $500,000 grant from Google for Education. How did this opportunity come about, and how will the funding be used?

This opportunity emerged through close collaboration with my colleagues, Dr. Valeisha Ellis at Spelman College and Dr. Valerie Bennett at Clark Atlanta University. They are both STEM educators, and we've worked closely for years. Through our connections with Google Learning, we submitted a proposal showcasing some of the collaborative work we've been doing. Based on that and the preliminary outcomes from our research, Google decided to fund us.

Over the next two years, we'll work directly with pre-service teachers across the Atlanta University Center to develop them into computer science educators because that's a hyper-critical need across the country. In Georgia, we have less than 5% of the computer science teachers needed to meet state benchmarks for supporting computer science education. Our goal is to increase the number of computer science educators graduating from the Atlanta University Center. This will support professional development for students and internships where they'll work directly with industry professionals.

Currently, many computer science teachers lack practical experience. Often, we're certifying math teachers through required courses, but they haven't faced real-world problems. This program will give them hands-on experience, allow them to build relationships with industry professionals, and prepare them to engage practitioners in their classrooms to enrich learning environments. We'll also collaborate with in-service teachers to expand this ecosystem and provide access to research-practice partnerships for computer science educators across Georgia.

Another opportunity is a research program we're planning in collaboration with a national consulting company that specializes in government contracting. The focus will be on studying AI readiness among higher education faculty and K-12 teachers. We aim to assess developing workforce needs and skills and explore strategies to better support those needs in both K-12 and higher education.

You recently met with two congressional offices. How did those meetings come about, and what were the main objectives?

Huge thanks to SSN for arranging those meetings. Andrew Pope [SSN's Director of Policy] reached out and let us know that, given the focus on digital literacy and integrating generative AI into education, some congressional offices were interested in meeting. We met a few times to brainstorm and draft a plan for those meetings.

At the meetings, we discussed recent legislation on data science literacy and ethical AI use, shared how our research supports these efforts, and explored ways to build ongoing partnerships to advance this work. With the recent election, however, everything is on hold. Still, this is a bipartisan issue, and there's strong recognition on both sides of the aisle about the importance of supporting students and the education system to implement generative AI ethically and effectively.

You're part of the SSN Education Scholars Training Program's inaugural class. What has being part of this cohort meant to you?

It's been an amazing ride. We met for the first time last January and had the opportunity to engage with some incredible scholars from across the country. We've had a lot of offline conversations, learning about each other's research and identifying areas where our interests and topics align. This experience has really built a network of individuals who are passionate about diverse areas of study. There are so many connections I

might not have made without this program—or without SSN.

The real beauty of what SSN does is translating the work researchers are doing into content that's digestible for general audiences. Often, we get deeply immersed in our research and focus on publishing academic papers. Personally, I didn't want that to be the extent of my work. I wanted that work to impact a broader community.

The workshops I've taken through this cohort on writing op-eds, developing connections with legislators both at the national and local levels, and thinking about how we take our research from academic significance to impacting broader society have been really valuable.

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Dr. Ballenger's research focuses on the academic achievement of underserved populations and pathways for students from underserved backgrounds to pursue STEM careers in the United States and abroad. As a component of this research, he also investigates teaching practices and teacher preparation programs for STEM educators. He holds the role of Co-Principal Investigator for the NSF-funded Institute for African American Mentoring in Computing Sciences (IAAMCS) and serves as the Research Lead for the National Data Science Alliance (NDSA).