



# CIRCLS

Center for Integrative Research in  
Computing and Learning Sciences

## CIRCLS Stories



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*-Son Pham, Nha Viet Institute*

*“Joining CIRCLS offered me a space to share my experiences and learn from fellow educators particularly on aspects dealing with integrating technology tools to enhance student engagement.”*

*-Collins Moga, University of Massachusetts Dartmouth*

*“In a lot of ways, I feel like I’ve grown up in and with this community.”*

*-Breanne Litts, Utah State University*

**As CIRCLS wraps up, we wanted to give the community an opportunity to share their unique stories about the impacts of CIRCLS and NSF’s Exploratory Research Programs, Cyberlearning, RETTL, and RITEL (NSF EXPs).**



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## Emergent Impact Through Networked Communities

**Lorna Quandt, Gallaudet University**

***“Two of my students did dissertations connected to the RETTL project, so it is fair to say the awards were impactful for them as well. Last year, I started chatting with a CIRCLS colleague about a potential idea for a grant proposal, and cut to one year later—we are now funded Co-PIs on a new RITEL award!”***

“The CIRCLS community has changed the trajectory of my career in exciting and unexpected ways. The first federal grant I won was an EAGER award funded by Cyberlearning, and winning that award launched my career in the world of emerging technology and educational tech. From that EAGER, I wrote and won a RETTL award, which allowed me to fund and train several incredible students. **Two of my students did dissertations connected to the RETTL project, so it is fair to say the awards were impactful for them as well. Last year, I started chatting with a CIRCLS colleague about a potential idea for a grant proposal, and cut to one year later—we are now funded Co-PIs on a new RITEL award!** That would not have happened without the CIRCLS community, and the CIRCLS convenings.

The work enabled by these awards, and supported by the CIRCLS community, is making a real difference in the world of accessible emerging technology. **With this work, my team has built a virtual reality tool to teach American Sign Language, built largely by deaf students, researchers, and technicians.** We have made huge strides in showing that equitable and accessible work in this space is possible, and I hope that our work can serve as a model for others in the accessibility and learning tech world.”

**Yangming Shi, Colorado School of Mines**

***“The support from the researchers in CIRCLS helps me navigate challenges in my early academic career, guiding me toward impactful research and personal***

***growth.”***

CIRCLS is an **inclusive and supportive community**. These group mentoring sessions in CIRCLS have helped me a lot as a junior faculty member. These interactions not only **offer me insights into different research approaches but also help me refine my own ideas and methodologies, setting a strong foundation for future projects and collaborations with other researchers**. The support from the researchers in CIRCLS helps me navigate challenges in my early academic career, guiding me toward impactful research and personal growth.

## **Ryan Watkins, George Washington University**

***“CIRCLS transformed my perspective, helping me see connections between my work and NSF funding opportunities, opening up new pathways for interdisciplinary research, and sparking ideas that continue to shape my work today.”***

“CIRCLS transformed my perspective, helping me **see connections between my work and NSF funding opportunities, opening up new pathways for interdisciplinary research, and sparking ideas that continue to shape my work today**.

After two years of limited collaborations due to COVID, participating in the CIRCLS Summer 2022 Incubator brought renewed energy and valuable connections to my research. **This interactive program introduced me to colleagues nationwide working at the intersections of learning science, computer science, and the future of work**. These conversations continued beyond the Incubator, and although our group didn't submit a joint proposal, the experience inspired me to collaborate with a computer science faculty member at a nearby university. Together, we submitted a RITEL proposal in January 2024, and though it wasn't initially funded, positive feedback encouraged us to submit a revised version later in the year. We're now exploring an additional ER2 proposal for early 2025.”

## **Drew Olsson, Agua Fria Union High School District**

***“CIRCLS exposed me to a network of exceptional educators that continue to be a source of mentorship and has provided tangible resources that have directly benefited my school community.”***

**CIRCLS exposed me to a network of exceptional educators that continue to be a source of mentorship and has provided tangible resources that have directly benefited my school community.** The world of education needs more Tech Integration experts to be leading the way in the age of AI. The intersection of learning science and computer science is the core of how we as educators can navigate any emerging technology, and the educators involved in CIRCLS are an example for all.

This past summer I was able to co-create a webinar on using generative AI to transform learning experiences. We went through a framework on how we can move beyond using AI for efficiency, to design rich, equitable learning experiences for all. **I recently presented this PD to my local ISTE/COSN chapter and will use it for future trainings to safely and effectively integrate AI in our schools.**

## **Collins Moga, University of Massachusetts Dartmouth**

***“Many in the community were willing to continue discussions beyond in-person events. CIRCLS members continue to generously share resources such as funding opportunities and expert advice.”***

“My journey with CIRCLS began when I was introduced to the community by Judi and Pati during a time when I was completing course work for my doctoral studies in STEM Education. At the time, I was also teaching internationally in Beijing, China. I was invited to support a research initiative related to emerging technologies alongside other educators. **Joining CIRCLS offered me a space to share my experiences and learn from fellow educators particularly on aspects dealing with integrating technology tools to enhance student engagement.** Meeting Judi Fusco was instrumental because she facilitated connections with teachers and researchers. These connections helped me expand my network and knowledge of emerging technologies.

The most impactful aspect of my CIRCLS experience has been the **connections formed and collaboration opportunities that sprung up after our in-person networking at the CIRCLS Convening.** Engaging with the broader community was enriching. There were lots of discussions around the potential for future research collaborations. I am immensely grateful for the opportunity to network with individuals deeply invested in

education and technology. Many in the community were willing to continue discussions beyond in-person events. **CIRCLS members continue to generously share resources such as funding opportunities and expert advice.** This support has been crucial for the development of my Ed Tech projects, as well as for exploring pathways to make projects more equitable.

Personally, I think the most impactful aspect of my involvement with the CIRCLS community has been the dialogues on shaping equitable EdTech projects. These dialogues have significantly influenced the trajectory of my work and commitment to equitable educational opportunities using technology.”

## **Hengtao Tang, University of South Carolina**

***“Each CIRCLS convening since has left me with unforgettable memories, and I am grateful to carry this experience with me. CIRCLS isn’t just an event; it’s a journey that continues to inspire.”***

The CIRCLS Convening was the first NSF conference I attended since I was a graduate student. I felt incredibly lucky to be part of CIRCLS ’17. It was a spectacular experience. I still remember the excitement of stepping into a space buzzing with groundbreaking innovations in technology and learning. **It wasn’t just the advancements that amazed me but also the diversity of perspectives, the community was deeply interdisciplinary, bringing together minds from so many different fields.** The convening’s dedication to equitable, co-designed learning was palpable, with spaces intentionally created for each attendant to share unique perspectives and co-constructing the agenda at expertise connections sessions. Each CIRCLS convening since has left me with unforgettable memories, and I am grateful to carry this experience with me. CIRCLS isn’t just an event; it’s a journey that continues to inspire.

## **Andrew Fenstermaker, Iowa City Schools**

***“My experiences with CIRCLS truly propelled my district ahead at a pace that would have been unattainable without CIRCLS.”***

**Participating in CIRCLS equipped me with an expanded network of thought leaders from across the United States as well as tools, resources, and knowledge** to lead the charge on emerging technologies in the Iowa City Community School District. By attending the Convenings and virtual working groups, I was able

to establish working groups in Iowa City to update board policies around generative AI (genAI), craft student and teacher guidelines around the responsible use of genAI, and develop AI student curriculum that equipped learners with an understanding to safely navigate AI in education. Furthermore, I was able to lean into new connections from CIRCLS and lead a summer webinar series to share work we had done in Iowa City as well as tools and resources for others charting their own courses. My experiences with CIRCLS truly propelled my district ahead at a pace that would have been unattainable without CIRCLS.

## **Arun Balajiee and Lekshmi Narayanan, University of Pittsburgh**

***“The things people could gather from the convening and apply towards working with an industrial and research collaboration. The seeds for long term contact and interactions were sown.”***

“Attending CIRCLS was among the top events in my journey as a PhD student. I met several like-minded scholars, who work on domains and topics that are quite different from my current path. **I got a perspective on the kinds of changes I could bring to my current research to make the topic more relevant to the trends in research** — equitable educational opportunities and supporting people who need the benefits of these technologies more than others. I learnt several things — firstly about the projects / research interests of various scholars, and research faculty. I met postdoc researchers working on this topic and their future career trajectory which may become my trajectory. Several eminent researchers were present in one spot and that was quite useful. This is something that seemed once in a lifetime to me.

I also tried to network as much as possible to benefit in the process towards writing publications or work together towards a common goal that can be written as a grant proposal. I met several practitioners and researchers who work closely with the people in the field, so that they could bring important and improvements to their current status quo in the educational domain.

I also learnt that some successful outcomes were that people found ideas that matched each others interests. The topics that various researchers could work on then is available as written proposal for grant submissions. **The research showcase as well as the roundtable topic discussions among the various faculty researchers + scholars was suitable for ideation, brainstorming and writing better proposals.** The things people could gather from the convening and apply towards working with an industrial and research collaboration. The seeds for long term contact and interactions were sown.

## **Kip Glazer, Mountain View High School**

***“The experience has pushed me to think more critically about my practice. The people I met have encouraged me to think deeply about the future of learning technologies and the impact of learning science.”***

Since 2015, I have met so many brilliant researchers and practitioners as a result of participating in CIRCLS and EducatorCIRCLS. The experience has pushed me to **think more critically about my practice**. The people I met have encouraged me to think deeply about the future of learning technologies and the impact of learning science. I have been inspired to continue reading and writing to stay engaged in the learning science field. I can't thank the researchers enough for providing me with many opportunities to **access the latest learning technology tools and other cutting-edge science research on topics such as Artificial Intelligence (AI)**. The learning science community has opened so many doors for me to continue to grow as a practitioner, and I am so grateful to have received support from researchers who value practitioners.

## **Yangming Shi, Colorado School of Mines**

***“It has deepened my understanding of how innovative educational tools and technologies can support learning in my field.”***

One of the most impactful outcomes of my NSF EXP project has been the ability to **translate theoretical concepts into practical, real-world applications**, specifically within the civil engineering domain. It has deepened my understanding of how innovative educational tools and technologies can support learning in my field. In addition, it also has enhanced my skills in interdisciplinary collaboration, where I've learned to integrate diverse perspectives from education, technology, and engineering. Another valuable outcome has been the collection and analysis of data that informs evidence-based practices, enabling me to make meaningful contributions to both the academic community and industry practices. These insights have shaped my approach to teaching, research, and future projects.



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## Equitable Co-Designed Learning and Practice

**Tina Cheuk, Cal Poly-San Luis Obispo**

***One of the biggest challenges, and ultimately the most rewarding part of my participation in CIRCLS, was navigating conversations that brought divergent ideas together.***

“As a teacher educator who works with bilingual and GenEd teachers in inclusion settings, I often grapple with the tension between imagining the future potential of AI in education and confronting the challenging realities that public school teachers face daily. This experience has only **heightened my awareness of the need to critically assess AI investments, pushing me to question whether our solutions genuinely address root causes rather than merely applying technological fixes to complex, systemic issues.** I ask myself and my peers, “”Who ultimately benefits from these AI tools?””, “”Who holds the power?””, and “”Who then become empowered by the innovations?””

**One of the biggest challenges, and ultimately the most rewarding part of my participation in CIRCLS, was navigating conversations that brought divergent ideas together.** I’m cautiously optimistic about seeing how these exchanges could move us beyond niche technology applications, steering us toward broader, equity-driven goals. This dynamic process of debate, critique, and collaborative problem-solving made it clear that our shared values around justice and equitable access must guide our work with AI and technology in education.

My involvement in CIRCLS has strengthened my resolve to ensure that the AI solutions we explore align not only with the challenges the diversity of our teachers and students face but also with our **commitment to fostering an educational landscape that prioritizes and centers equity and justice.** What is notable was that at times, values and beliefs around equity and justice was not always in alignment.

**Gennie Mansi, Georgia Tech**



***Through the RETTL grant and CIRCLS I got to engage in cross disciplinary and hands on work with K12 engineering teachers.***

I am a PhD student, and I got to work on a RETTL grant with my advisor and attend a CIRCLS conference. **Through the RETTL grant and CIRCLS I got to engage in cross disciplinary and hands on work with K12 engineering teachers.** I learned a lot about community based work to make technology that responds to teachers' needs. I've been energized by seeing the positive responses of our study participants to what we're building. Through RETTL/CIRCLS I also got to learn a lot about how to write a grant, which has positively impacted me. Since attending, I have written my own supplemental funding grant that helped me travel overseas, and I worked with my advisor on a separate grant for a longer term project. It's given me a lot of good professional connections and mentoring!

## **Autar Kaw, University of South Florida**

***The conference provided new ideas, such as using cloud-based polling instead of physical clickers during on-campus classes. The focus on equity was significant, emphasizing ways to reach all learners.***

I attended the CIRCLS conference twice, virtually in 2021 during the COVID-19 epidemic and face-to-face in 2023. At that time, we had an NSF grant #2013271 titled "Transforming Undergraduate Engineering Education through Adaptive Learning and Student Data Analytics." The grant was given to study the use of personalized online lessons to improve pre-class preparation for flipped learning. The research questions and methods initially intended for face-to-face classes had to be revised for remote learning. **The conference provided new ideas, such as using cloud-based polling instead of physical clickers during on-campus classes. The focus on equity was significant, emphasizing ways to reach all learners.** During COVID, socioeconomic disparities became more apparent, and solutions like open education resources made course materials affordable. Live YouTube streaming helped reduce the internet bandwidth required by students. Both these ideas were inspired by the small group discussions at the conference.

## **Marlon Matilla, Pulaski County Special School District**

***CIRCLS has fostered a collaborative, ethics-centered approach that has greatly enhanced my ability to develop inclusive and impactful AI educational tools for diverse learning environments.***

My CIRCLS Teacher Fellowship has profoundly shaped my work, enriching my expertise in ethical AI education. Co-presenting the webinar Navigating Ethical AI: Interactive Lessons and Equitable Practices for Educators has been a highlight of my professional journey with CIRCLS. **Presenting at a roundtable during the 2023 CIRCLS Convening allowed me to exchange and refine ideas on equitable practices in both education and AI.** Additionally, participating in CIRCLS-led mock review panels sharpened my critical evaluation skills, which I applied in co-designing AI education resources with Stanford's CRAFT initiative. **CIRCLS has fostered a collaborative, ethics-centered approach that has greatly enhanced my ability to develop inclusive and impactful AI educational tools for diverse learning environments.**

## **Teon Edwards, TERC**

***Young, learner stakeholder voices need to be part of our work and part of gatherings like this. For me, personally, these young people, their perspectives, their ideas, and their journeys have been the most impactful learning of my recent NSF-funded work.***



*CIRCLS '23 Youth Panel (image provided by Teon Edwards)*

In the fall of 2023, four neurodivergent young people were part of the CIRCLS 23 Convening, directly involving learners in this professional event. They presented a Youth Panel, sharing their experiences working as co-designers on projects about AR/VR technologies for neurodiverse audiences, and they attended other presentations and sessions, mingled, and networked with other attendees. Several colleagues and I coordinated bringing these young people to the convening, believing in its importance for both the youth and the rest of us. **Young, learner stakeholder voices need to be part of our work and part of gatherings like this. For me, personally, these young people, their perspectives, their ideas, and their journeys**

have been the most impactful learning of my recent NSF-funded work. To quote one of these young co-designers, “I never enjoyed doing group work as much as I did with you all.” I couldn’t agree more.

## **Keunjae Kim, Indiana University**

***The most impactful outcomes from our learning technology work involve implementing co-designed curricula with teachers, using physical computing tools, AI models with ML, and programming, all aligned with Indiana’s Science, STEM, and CS standards.***

The most impactful outcomes from our learning technology work involve **implementing co-designed curricula with teachers, using physical computing tools, AI models with ML, and programming, all aligned with Indiana’s Science, STEM, and CS standards**. This approach has enabled students to express their understanding in diverse ways, deepening their knowledge and attitudes toward AI through interactive, hands-on experiences such as coding and AI-driven projects. Through this work, we have successfully increased participation among underrepresented groups in rural elementary and middle schools and made strides in addressing gender disparities in STEM+C education. Recognized with the 2024 Outstanding Journal Article Award from AECT, this work has demonstrated how tangible computing tools can significantly enhance elementary students’ AI knowledge. Moving forward, I plan to build on these experiences by furthering co-design, equitable technology integration, and community engagement to create inclusive learning opportunities that empower all students to actively shape the future of technology.

## **David Lockett, Meharry School of Applied Computational Sciences**

“The Meharry SACS NSF projects yielded significant insights into the ethical considerations and trustworthiness of AI in scientific research and education.

Key impactful learnings include:

1. Enhanced understanding of how to develop and implement AI systems that are both ethical and trustworthy in scientific applications
2. Improved strategies for addressing bias and ensuring fairness in AI algorithms used in research and educational contexts
3. Development of frameworks for responsible AI governance that can be applied across various scientific disciplines

4. Increased awareness and skills among researchers and students in critically evaluating the ethical implications of AI in their work.

These outcomes have contributed to advancing the responsible use of AI in science while fostering trust in AI-driven research and educational tools.”

## **Kip Glazer, Mountain View High School**

***I have enjoyed providing my feedback from a practitioner’s perspective while learning from the researchers about their focus on creating a better tool for all types of learners.***

Because I had a front-row seat to the development of new learning technology tools, I learned a great deal about the focus of the National Science Foundation(NSF)’s mission of exploration and discovery. I appreciate their focus on expanding the learning science field while engaging the practitioners to create a more significant impact in the education field. **I have enjoyed providing my feedback from a practitioner’s perspective while learning from the researchers about their focus on creating a better tool for all types of learners.** For example, it’s typical for a project, a blog, or a webinar to feature both researchers and practitioners so that both are able to showcase their expertise while enhancing the quality of the final product.



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## Exploration and Discovery Across New Frontiers

**Keunjae Kim, Indiana University**

*“These experiences have strengthened my commitment to equitable technology integration in K-12 education, aiming to create inclusive learning opportunities that benefit underrepresented groups, such as female, non-binary, and rural students.”*

My participation in the CIRCLS'23 Convening as an Emerging Scholar has profoundly influenced my work. **The convening helped refine my vision, focusing on responsible AI usage and empowering students to create tangible AI-driven projects.** Keynote speeches, roundtables, and networking with scholars provided valuable insights for scaling my work. Dr. Marcelo Worsley's keynote on empowering learning communities through multimodal technologies inspired me to prioritize social justice and accessibility in my research. Dr. Meredith Broussard's keynote on algorithmic bias underscored the importance of addressing ethical issues in AI, shaping my approach to problem-solving. Leading a roundtable discussion on generative AI tools for counterfactual questions broadened my understanding of innovative approaches. **These experiences have strengthened my commitment to equitable technology integration in K-12 education, aiming to create inclusive learning opportunities that benefit underrepresented groups, such as female, non-binary, and rural students.**

Figure 1

a and b: An AI garbage can, and an AI pill sorter created with microcontrollers, sensor, and actuator  
c and d: Students testing their AI artifacts to ensure the AI model and codes are functioning properly



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a and b: An AI garbage can, and an AI pill sorter created with microcontrollers, sensor, and actuator  
c and d: Students testing their AI artifacts to ensure the AI model and codes are functioning properly

## David Lockett, Meharry School of Applied Computational Sciences

*Through these collaborations, we've gained valuable insights into emerging technologies and pedagogical approaches that integrate AI and data science into learning environments.*

Participation in CIRCLS has significantly shaped the direction of our work in AI and data science education. Through these collaborations, we've gained valuable insights into emerging technologies and pedagogical approaches that integrate AI and data science into learning environments. **The interdisciplinary nature of these programs has broadened my perspective on how AI can be ethically and effectively applied to enhance student learning outcomes.** Additionally, the networking opportunities have led to new partnerships

with other researchers and educators, enabling the development of more comprehensive and innovative AI-driven educational tools. These experiences have not only informed my research methodology but also inspired new project ideas that align closely with NSF's vision for advancing AI in education.

## **Nikolas Martelaro, Carnegie Mellon University**

***“The CIRCLS events have helped our team learn from others and consider new ideas in evaluating how people are learning and what strategies we can employ to help them do their work better.”***

The NSF RETTL was my first major grant as a faculty and kickstarted a line of work on how designers and engineers learn to work with AI-based tools. **It has led me down a path of researching how designers think and how we can support designers in thinking more deeply.** The CIRCLS events have helped our team learn from others and consider new ideas in evaluating how people are learning and what strategies we can employ to help them do their work better. The program has also fostered my team's growth in providing undergraduate research experiences for students. In the last few summers, we have hosted four students who have contributed directly to the systems we are building and the studies we are running.

## **Son Pham, Nha Viet Institute**

***This exposure has not only inspired new research questions but also deepened my insights into innovative approaches, allowing me to align my research more closely with evolving educational needs.***

Participating in CIRCLS and NSF EXPs has significantly shaped the trajectory of my work. Engaging with scholar-practitioners at CIRCLS'23 and the EngageAI Forum 2024 has enriched my understanding of current educational challenges and provided a platform to exchange ideas across disciplines. **This exposure has not only inspired new research questions but also deepened my insights into innovative approaches, allowing me to align my research more closely with evolving educational needs.** Together with my work on teacher preparation in Artificial Intelligence in Education (AIED), I am now decisively moving towards exploring workforce orientation in the AI era. These experiences have equipped me to navigate my research and practice more strategically, ensuring relevance and impact in the field.

## **Breanne Litts, Utah State University**

***This community has shaped not only the trajectory of my work and willingness to take risks, but also who I am as a scholar and how I think about research, innovation, and equity.***

“In a lot of ways, I feel like I’ve grown up in and with this community. The Cyberlearning program funded the makerspace grant that I had the privilege of working on under the leadership of Drs. Erica Halverson and Kim Sheridan, and I had the honor of supporting the organization of the 2014 Cyberlearning Summit at the University of Wisconsin-Madison. I have made it priority to attend the summit/convening every year since. **The high stakes/high rewards nature of the various evolutions of the CIRCLS-related NSF programs coupled with the diligent efforts of CIRLCS staff to cultivate inclusive and expansive communities, has yielded in a uniquely encouraging and inspiring community of scholars, practitioners, educators, and designers.** This community has shaped not only the trajectory of my work and willingness to take risks, but also who I am as a scholar and how I think about research, innovation, and equity.

For the makerspace grant, our learnings are best summarized in two Harvard Education Review articles: Drs. Halverson & Sheridan’s “The maker movement in education” and our team’s “Learning in the making: A comparative case study of three makerspaces.”

For our RETTL project, while still ongoing, we’ve learned a lot about how to design through an equitable and community-centered approach. Some of our thinking is available in the following publications:

- Litts, B., Vouvalis, N., & Tehee, M. (2023) Building Ethical Infrastructure for Community Partnership Work: The “How to Engage Your IRB™ Edition. In Partnerships for Change: Transforming Research on Emergent Learning Technologies. (pp. 48-54). Digital Promise.
- Litts, B. K., Alladin, J. K., Tehee, M., & Cardona-Rivera, R. E. (2023, June). Gathering as Design Process: Physical Prototyping for Culturally Sustaining Computational Technologies. In Proceedings of the 2023 Symposium on Learning, Design and Technology (pp. 107-113).
- & an in-press IJDL article.”

## **Roghayeh Barmaki, University of Delaware**



***Community building is the key outcome of these events that I cannot find any alternatives to.***

“For me, or for most of interdisciplinary PIs like me, finding the exact aims and scopes of my proposed project, and where it fits within the broad landscape of the NSF programs has always been a challenge. **These events like Convening, or community exchange, or AI and Literacy Working Groups empowered me to interact more with NSF Program directors and other experienced PIs to help me see the boundaries more clearly and also most importantly, to communicate my science and innovation in the proposal writing more explicitly.** These efforts helped me to secure a sole-PI grant from NSF EHR already. Also serving in the panels has helped me a lot as well to gain clarity even further about communicating my science better.

As a computer scientist working on educational applications, **I always used CIRCLS as my inspirational resource to identify like-minded scholars, research projects, NSF, and other programs to shape my research path.** For example, funded RETTL Projects, community reports, working groups, and most importantly, Emerging Scholars are very helpful in connecting me with the cognizant program officers or leading experts in the field.

As another valuable resource, the CIRCLS Convenings have been instrumental for me to explore the avenues for future research, not only by meeting and talking to the PIs of these projects, but also by showcasing my own expertise, even though I was not funded by RETTL/RITEL myself yet.

The community is very vibrant and interdisciplinary and I always enjoy to discuss ideas and get insights for the research problems I am trying to solve in education. So, all together all of these have been invaluable, open-access assets to shapen my research. Finally, **I have established new collaborations and some of these lead to new grant ideas that we hope to get it funded by the programs of interest. Community building is the key outcome of these events that I cannot find any alternatives to.”**

## **Chad Dorsey, The Concord Consortium**

***The excitement on the bus was palpable as we wove through DC traffic toward the National Geographic building. This event was going to be the start of something big, we felt. Indeed, the February 2012 Cyberlearning Summit, an event that would give birth to CIRCLS only a handful of months later.***

The excitement on the bus was palpable as we wove through DC traffic toward the National Geographic building. This event was going to be the start of something big, we felt. Indeed, the February 2012 Cyberlearning Summit, an event that would give birth to CIRCLS only a handful of months later. I remember I was checking my slides when Bill Finzer leaned over to my seat and said, "I've changed my title. I'm going to call for creating the field of data science education." My quizzical response at the time was to ask what exactly that was. But his talk the next day explained it perfectly and did much more than that.

**That talk indeed marked a turning point, after which K-12 data science education would become an ever-more-recognized idea and eventually a field of education and research in its own right.** But don't take my word for it; the data speaks louder than any impact story. That point where a Google Trends graph for "data science education" first ticks upward? February 2012. The date of that first Cyberlearning summit.

## **Bonnie Sutton, National Collaboration for Digital Equity**

***Access to people, projects and resources enabled me to participate in national and international outreach efforts and to share ongoing research, develop local, national and global knowledge and expertise for the benefit of K 12 educators.***

"My personal experience was a **demonstration of the power of digital equity and the effectiveness of kickstarting the uses of technology in varied learning environments.** Initially my involvement in the use of technologies in school was piecemeal and contested by supervisors who were not technologically involved. The first NSF Grant was a passport to the creditability of new ways of learning which gave some acceptance and funding. But involvement in CIRCLS was a jumpstart to further exploration and involvement and integration across the learning landscape with ideational scaffolding supported in education. Because I came from a limited technology experience it was a powerful demonstration of the effectiveness experience in my preparation for basic classroom experience it enhanced my ability to bring others with me to participate in developing teaching techniques in technology.

**Access to people , projects and resources enabled me to participate in national and international outreach efforts and to share ongoing research, develop local, national and global knowledge and expertise for the benefit of K 12 educators.**

I, armed with knowledge from this community the knowledge and skills of CIRCLS, was selected to discuss, discuss distribute and demonstrate this knowledge by projects from the White House and to participate in Supercomputing that involved other educational programs. Digital Equity was demonstrated.

## **Nikolas Martelaro, Carnegie Mellon University**

***We are now exploring how to automate thoughtful questioning and assistance for designers and engineers.***

Our research has found that providing support to help designers and engineers learn to work with AI tools might be well served by having systems that question the user and support thinking processes over automating their work. **We have explored different strategies, such as asking questions and providing hints on how to work with an AI, finding that some strategies work well in some cases – but the right question posed at the right time can change the trajectory of a design session and help someone go from failing to work well with the software to being productive.** We are now exploring how to automate thoughtful questioning and assistance for designers and engineers. The impact of this work could one day lead to AI design partners that help people think more deeply and better set up problems that can be solved with AI tools.

## **Son Pham, Nha Viet Institute**

***This exposure has not only inspired new research questions but also deepened my insights into innovative approaches, allowing me to align my research more closely with evolving educational needs.***

Participating in CIRCLS and NSF EXPs has significantly shaped the trajectory of my work. Engaging with scholar-practitioners at CIRCLS'23 and the EngageAI Forum 2024 has enriched my understanding of current educational challenges and provided a platform to exchange ideas across disciplines. This exposure has not only inspired new research questions but also deepened my insights into innovative approaches, allowing me to align my research more closely with evolving educational needs. Together with my work on teacher preparation in Artificial Intelligence in Education (AIED), I am now decisively moving towards exploring workforce orientation in the AI era. **These experiences have equipped me to navigate my research and practice more strategically, ensuring relevance and impact in the field.**



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## Acknowledgments



We want to thank all of those who have submitted their stories!

[Arun Balajjee](#), University of Pittsburgh

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Gennie Mansi, Georgia Tech

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Lorna Quandt, Gallaudet University

[Yangming Shi](#), Colorado School of Mines

Bonnie Sutton, NCDE

Hengtao Tang, University of South Carolina

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