Request for Information: National Priorities for Artificial Intelligence
Alliance for Learning Innovation
Education Advocacy Organization

The Alliance for Learning Innovation (ALI) brings together education nonprofits, philanthropy, and the private sector, to advocate for building a better research and development (R&D) infrastructure in education. Considering that R&D is a relatively untapped engine of innovation in the education sector, ALI advocates for increased capacity of education R&D and supports the research and development of evidence-based innovation that centers students and practitioners, advances equity, improves talent pathways, and expands the workforce needed in a globally competitive world.

ALI sees great promise and opportunity for artificial intelligence to improve education, equity, economic opportunity, and national security. In order to realize this opportunity and mitigate risks, we must ensure that the US has a robust, inclusive, and updated education R&D ecosystem that crosscuts federal agencies, and with the Institute of Education Sciences (IES) playing a key role in driving forward an AI agenda that improves educational outcomes, mitigates the risks associated with AI, and that guides critical policies and guidelines for its use.

Stunning advancements in generative AI, most recently demonstrated by ChatGPT, show the potential of what R&D could do. With careful design, stakeholder engagement and attention to research and development, there is potential for AI to improve teaching, learning, and equity. A healthy education R&D ecosystem will cultivate future generations of talent in the STEM fields (including AI) and lead to innovations that strengthen national security and our global competitiveness. However, this cannot be accomplished without simultaneously investing in strong education R&D infrastructure that helps us develop equitable and safe uses of AI technologies.

One strong existing Federal example are the AI Institutes supported by the National Science Foundation (NSF) and the U.S. Department of Education (ED). Earlier this year, NSF and IES established the AI Institute for Exceptional Children, which capitalizes on the latest AI research to serve children with speech and language pathology needs. Communities would benefit from additional AI Institutes that meet the moment and deliver solutions for today's teaching and learning challenges. Privacy and bias considerations need to be inherent in the research questions being tackled by these and other federally funded AI research efforts.

Question #9 What are the opportunities for AI to enhance equity and how can these be fostered? For example, what are the potential benefits for AI in enabling broadened prosperity, expanding economic and educational opportunity, increasing access to services, and advancing civil rights?

When thoughtfully and inclusively designed, AI has the potential to enhance equity by providing more personalized learning for students and by supporting educators to address the individual and diverse needs in their classrooms. For example, AI could be utilized in teacher preparation

programs to ensure that educators have access to more diverse experiences during their pre-service experiences. AI can also provide benefits and services to students and families who currently do not have access to those resources due to a lack of human capital.

One strong model to expand are the AI Institutes. Earlier this year, NSF and IES established the AI Institute for Exceptional Education, which capitalizes on the latest AI research to serve children with speech and language pathology needs. Communities would benefit from additional AI Institutes that meet the moment and deliver solutions for today's teaching and learning challenges. Privacy and bias considerations need to be inherent in the research questions being tackled by these and other federally funded AI research efforts.

Attention should be paid to the design, evaluation and implementation process consistent with the recommendations in the recent report from the Office of Education Technology, "Artificial Intelligence and the Future of Teaching and Learning Insights and Recommendations." AI works best when it is addressing a particular need in teaching in learning or a particular resource gap. AI design and implementation needs to involve educators at every step of the way and particular attention and resources need to be directed to the evaluation of novel resources and tools to ensure they are not perpetuating bias or causing harm to communities.

Question #10 - What are the unique considerations for understanding the impacts of AI systems on underserved communities and particular groups, such as minors and people with disabilities? Are there additional considerations and safeguards that are important for preventing barriers to using these systems and protecting the rights and safety of these groups?

Diverse teams working on AI are essential, especially because of the risk of bias in AI technology. In K-12 classrooms, AI may provide biased recommendations about discipline, the pacing of curriculum, or class placement. In higher education institutions, bias from algorithms may create discriminatory decisions around enrollment and interventions. Large language models, for example, have shown to produce misinformation at times and provide problematic solutions to students from historically marginalized groups.

It is also important to recognize that AI is limited to the data sets it is trained on. For example, if AI is created utilizing recommendations that are not evidence-based it could lead to the adoption of recommendations that are inconsistent with the current knowledge based on what works in teaching and learning. In order to mitigate risks, we must prioritize diverse teams working on AI, utilizing best practices in inclusive R&D and ensuring that rigorous testing and evaluation is part of the design and implementation process for new tools. It is also essential that data from individuals in underserved populations–persons with disabilities, those in racially minoritized groups, those living in poverty–is included in AI data modeling rather than excluded as "outlier cases."

Prioritize Inclusive R&D around AI and specifically AI in education: First and foremost, we need to ensure that underserved communities, minors, individuals with disabilities and the civil rights organizations that support them are at the table throughout the design process for AI

tools and products. There is a lot to be learned from inclusive R&D models such as the models utilized by ALI coalition members Digital Promise and AERDF.

In particular, we need to ensure that research is led and driven locally and by those who are closest to the challenges, namely educators, parents, students, and local and state leaders. This includes a larger emphasis on prioritizing deep stakeholder engagement at the forefront to determine the most relevant and impactful research questions and implementing inclusive R&D methods and practices that move beyond engagement to co-research, design and leadership in partnership with practitioners, students and families throughout the research process. IES should collaborate with organizations who have expertise in developing inclusive R&D models to scale effective opportunities to co-design and co-develop research agendas and research questions with students, families, educators, and school leaders to ensure research and evidence is relevant and timely.

Prioritize incentivizing diverse teams and ensuring diverse teams working on AI at the federal level: Diverse teams produce better tools and technologies and lead to greater innovations and breakthroughs. There are many ways the federal government can play a role in incentivizing diverse teams through grant competitions and contracting vehicles. Microsoft, in its Inclusive Design Toolkit, refers to this as "learning from diversity," where including more people in the design process and widening the talent pool is key to addressing important societal challenges, so called "wicked problems." As our society moves to quickly adopt artificial intelligence and machine learning in ways that impact all areas of our lives, there is both potential for greater inclusion or exclusion depending on the way the AI is designed and implemented. Including people with disabilities and other differences in the design of the AI may help safeguard against the negative impacts of bias in AI, which is essential if we are to build an AI-driven future that is equitable for everyone in society. Moreover, many technologies we take for granted today, from captioning to text translated into speech, were created because of the lived experience of people with disabilities. Throughout history, examples abound of the "curb cut effect" in action, where solutions intended for people with disabilities result in innovations that benefit everyone.

There is also a lot to be learned from the NSF's rotator program, which is instrumental in ensuring the agency's programs reflect creative ideas from the field, the most advanced methods and diverse teams. More agencies should support rotator programs to ensure they are bringing in diverse and leading talent to address the potential implications and unique needs of diverse communities. These programs could leverage authority from the Intergovernmental Personnel Act to engage advanced scientific and technical expertise, and build internal capacity.

Federal agencies and specifically IES should build upon the training programs it has for broadening participation and create specific research grant programs for HBCUs, TCUs, and MSIs that have an emphasis on AI research. While the IES Pathways program has had success in diversifying education research training programs, more needs to be done at the predoctoral and postdoctoral level. IES should look at opportunities to collaborate with ED's Ronald E. McNair Postbaccalaureate Achievement Program and Title III and Title V Institutional Service programs. In December 2020, IES released a report "Increasing Diversity and

Representation of IES-funded Education Researchers." Among the findings included in the report[2]:

- "IES also has 2013 to 2020 data on the types of institutions that apply for funding. From 2013 to 2020, approximately 4 percent of applications to NCER and less than 1 percent of applications to NCSER were from MSIs."
- "For NCSER, no minority-serving institutions have received funding between 2013-2020."

IES should explore replicating NSF programs like the Centers of Research Excellence in Science and Technology (CREST), HBCU Research Infrastructure for Science and Engineering (HBCU-RISE), and Tribal Colleges and Universities Program (TCUP), which aim to enhance the research capabilities of institutions that serve underrepresented populations.

Fulfill the civil rights of learners through prioritizing the accessibility and universal design of AI: AI must be accessible for all. "Available" is not the same as "accessible" nor does something being digital assure accessibility. Indeed, much of current AI is demonstrably inaccessible. For example, many of the chatbots or image generators rely on print and keyboarding for communication between the person entering the AI prompt and the bot. Another issue here is the way analytic AI systems present information in dashboards that, so far, are universally inaccessible (e.g., violations in color contrast, lack of image descriptions, indeterminate reading structure/order). These limitations in the current design and interface of AI tools are counter to the requirements of Section 508 of the Rehabilitation Act, which is the standard customarily used by the courts to consider whether or not environments or materials are ADA-compliant. When Section 508 is applied to new or emerging technologies without standards in place–for example, with the current growth of AI technologies and tools–the concept of equivalent facilitation comes into play. These new technologies have to work as well or better for people with disabilities as it does for individuals without disabilities.

As AI is used and developed, it will only be accessible for **some** users if it does not proactively anticipate (and subsequently design for) natural human variability. If developers use the Universal Design for Learning Guidelines to make AI tools accessible, its use will increase the accessibility of education overall. If, however, developers do not consider the needs of individuals with disabilities in their designs of AI, students who already have insufficient access to education will have even less access to robust and inclusive learning. It should be considered that in any policy or set of suggestions for the procurement, development and/or use of AI in education, it is stated that UDL be used as a lens, i.e. UDL should be used as a metric and a standard. Millions of educators worldwide use CAST's UDL Guidelines to inform how they design learning on a daily basis and, as a result, millions of students worldwide have access to learning they did not have previously. Therefore, the requirement to use the federally-recognized UDL Framework and Guidelines must be incorporated into any investments into AI.

Question #15 - What are the key challenges posed to democracy by AI systems? How should the United States address the challenges that AI-generated content poses to the information ecosystem, education, electoral process, participatory policymaking, and other key aspects of democracy?

AI literacy will become an increasingly important aspect of digital literacy and should be incorporated into school curricula and public awareness initiatives. As AI is used to create more content, students and adults will need to understand what AI can do and how to respond to AI content in an ethical and meaningful way. There is great potential for misinformation and manipulation using AI tools and the development of the tools will never slow down. Guardrails such as identification of AI generated content could be put in place but such guardrails may do little to blunt the impact of AI generated images and content without meaningful education–formal and informal–on how best to read and interpret AI content.

Question #17 - What will the principal benefits of AI be for the people of the United States? How can the United States best capture the benefits of AI across the economy, in domains such as education, health, and transportation? How can AI be harnessed to improve consumer access to and reduce costs associated with products and services? How can AI be used to increase competition and lower barriers to entry across the economy?

The Alliance for Learning Innovation has focused mostly on the potential impact of AI on our education system. AI can help foster the skills students will need to navigate and shape the future. Tools like ChatGPT, as Dr. Kathy Hirsh-Pasek and Elias Blinkoff argue, can help promote students' critical thinking when used in sophisticated ways for deeper, more engaged learning.

We know that teachers are innovators and it should come as no surprise that many educators are already making great use of the technological tools available to them. In March 2023, the Walton Family Foundation released the results from a survey that showed:

- Within two months of its introduction, a 51% majority of teachers reported using ChatGPT, with 40% using it at least once a week, and 53% expecting to use it more this year. A larger proportion of teachers than students use ChatGPT regularly–just 22% of students said they use the technology on a weekly basis or more.
- Black (69%) and Latino (69%) teachers reported a higher rate of usage.
- Teachers are nearly four times more likely to have allowed students to use ChatGPT (38%) than caught them using it without their permission (10%). Only 15% of students admit to using the program without their teachers' permission.
- The majority of students (63%) and teachers (72%) agree that "ChatGPT is just another example of why we can't keep doing things the old way for schools in the modern world."
- Most students think it can help them become better students (68%) and help them learn faster (75%). Teachers agree: 73% say ChatGPT can help their students learn more.

The potential for AI to support educators and student learning is vast and still being discovered, but we do know that these tools if properly designed, tested and researched could have huge potential for personalized learning. We are only just starting to see what ChatGPT can do. An ARPA for education, such as a National Center for Advanced Development in Education (NCADE) at IES, could leverage these types of breakthrough innovations to address some of our nation's steepest challenges in education. The hope is that AI will spur educators, students, parents, and policy-makers to come together to consider what skills our students really need to

navigate uncertainty, solve complex challenges and shape meaningful futures in a changing economy.

In addition to the potential of generative AI for educators and students, the analytic capabilities of AI also contain great promise–and associated risks–for use in educational settings. The potential to use data to inform instruction and educational planning is immense but currently unrealized. At the school and district level, enormous quantities of data are collected and often not acted upon because of lack of capacity or time. AI has the potential to synthesize data from across an education system to identify and support decision making for the most vulnerable students. By paying attention to the right data, AI could help identify students who are least engaged, those with additional learning needs, those who are most likely to drop out of school, and students at risk of mental health concerns, even suicide. With this information comes a profound responsibility to investigate underlying causes and act with care. In these instances AI can support human decision making but should never take the place of human decision making. Outlining clear guidelines for the role of AI in educational planning and developing frameworks to use this information and guide decision making are essential before these technologies are brought online.

At the classroom level, the same issues arise. The quantity of data surpasses the time available to strategically use or act upon it. Currently AI in the classroom tends to be limited to circumscribed digital interactions like adaptive assessment and tutoring applications. Too often, it replaces human decision making on the part of the student or the teacher, squandering the opportunity for the student to learn about learning and for the teacher to understand what and how the student knows and make informed decisions on this basis. Embracing this same capacity more broadly in the classroom and setting up students and teachers to make decisions about learning, creates the opportunity to identify students most in need of support, diagnose what might help, and allow students to build their own skills as a learner supported by the relationship with their teacher. Again, this is only possible with a clear framework for the analysis of student data that is actionable by teachers, supporting meaningful human decision making.

Question #18 - How can the United States harness AI to improve the productivity and capabilities of American workers, while mitigating harmful impacts on workers?

K-12 educators, principals and district staff members are incredibly busy people who often wear many hats in a community. Gallup conducted a poll in 2022 and found that “More than four in 10 K-12 workers in the U.S. (44%) say they ‘always’ or ‘very often’ feel burned out at work, outpacing all other industries nationally. College and university workers have the next-highest burnout level, at 35%, making educators among the most burned out groups in the U.S. workforce.” If designed and tested well AI has the potential to save educators time from their very busy roles, as discussed above in our answer to Question #17. In particular, AI holds great promise to support educators to offer flexible options that address the variability of learners, personalize learning and provide individualized tutoring.

Question #24 - How can the Federal Government effectively and responsibly leverage AI

to improve Federal services and missions? What are the highest priority and most cost-effective ways to do so?

The Federal government could utilize AI to help speed up the processing time of data and report generation. AI could also be used to provide more customized reporting tools to help education leaders, families and other stakeholders have a better understanding of teaching and learning and what is working to improve outcomes for students.

AI could also be used to help users navigate the existing evidence-based tools and resources that exist in more customized ways. For example, there could be educator-facing chat bots that help to summarize the existing evidence from Federal repositories, like IES' What Works Clearinghouse, for particular teaching and learning strategies.

Question #25 - How can Federal agencies use shared pools of resources, expertise, and lessons learned to better leverage AI in government?

One strong model to expand are the AI Institutes. Earlier this year, NSF and IES established the AI Institute for Exceptional Children, which capitalizes on the latest AI research to serve children with speech and language pathology needs. Communities would benefit from additional AI Institutes that meet the moment and deliver solutions for today's teaching and learning challenges. Privacy and bias considerations need to be inherent in the research questions being tackled by these and other federally funded AI research efforts.

IES has an important role to play when it comes to research and development of educational tools that are powered by artificial intelligence (AI) to support teaching and learning, achieving equitable student outcomes at scale and personalized learning. Given the rapid pace of change, IES needs more opportunities to fund the development and evaluation of transformational teaching and learning tools that are designed and developed to address key challenges that educators and school leaders face, grounded in evidence about how students – and teachers–learn and are motivated. Technology in this context can be an enabler of better practices that are more affordable, reliable, and data-rich.

Another key opportunity to support transformational AI research and development at IES is to **establish a National Center for Advanced Development in Education (NCADE).** Modeled after DARPA, NCADE would support large-scale, innovative projects that require a more nimble and responsive program management approach than currently in place. Specifically, NCADE would fund projects developed by universities, nonprofits, industry, and innovative organizations, selected based on their potential to create dramatic breakthroughs in learning and teaching, especially for the most underserved populations. Like DARPA, NCADE would be oriented toward ambitious ideas across the academic, public, and private sectors. It would build on bipartisan interest in expanding education R&D, and put outcomes for students at the center of its work. The Center would focus on breakthrough technologies, new pedagogical approaches, innovative learning models, and more efficient, reliable, and valid forms of assessments. This federal investment would spark innovation at state and local levels, and help build local infrastructure to sustain the work. By creating NCADE, Congress can seed the development and use of artificial intelligence to support teaching, personalize learning, support ELL students, and analyze speech and reading.