IEEE★USA

POSITION STATEMENT

Artificial Intelligence: Education Pipeline & Workforce Alignment for National Competitiveness

Adopted by the IEEE-USA Board of Directors (November 2024)

IEEE-USA supports public-private efforts to ensure the American workforce can meet the challenges and impacts of emerging technologies on our economy.

IEEE-USA believes that governmental, private sector, and non-governmental institutions play a crucial role in maximizing opportunities for students and workers in the emerging AI economy; and in mitigating the negative impacts on individuals affected by widespread AI deployment. We view a comprehensive educational pipeline – encompassing primary, secondary, post-secondary, technical and community college education – as a fundamental building block for developing the AI workforce essential for AI-powered economic success. We advocate for supporting existing workers with upskilling opportunities to meet the emerging needs of AI-augmented workplaces. We believe support for workers whose livelihoods are negatively impacted by AI systems is essential. We advocate for safety net programs for displaced workers to help retrain and reintegrate them into the workforce; to fulfill in-demand jobs; and to maintain a vibrant economy. To these ends, IEEE-USA recommends that the U.S. Government:

1. **Create a Robust AI Education Pipeline**

Integrating AI literacy and computational science into core curricula is essential to maintain the United States' leadership in AI and emerging technologies. IEEE-USA advocates for the following actions to prepare an AI-ready workforce:

Modernize Pre-K-12 Education: Appropriate federal resources should lead a national initiative to embed AI foundational knowledge from early childhood through high school. This initiative should be done in collaboration with state education departments, mandating AI education across all Pre-K-12 classrooms. Key curriculum elements should include:

- fundamental courses in mathematics, computer science and robotics,
- courses that discuss the ethical challenges related to AI, promoting responsible usage, and awareness of societal impacts, and
- introductory courses in data science and machine learning.

To support this initiative, it is critical to increase federal funding for:

- professional development, certification programs, and resources for educators.
- research on AI education best practices and content integration, and

- resources to inspire students to pursue AI-related careers.

Update Post-Secondary Education: At the post-secondary level, strong incentive structures are necessary to attract and retain students in AI-related fields. We recommend:

- increasing scholarships and federal professional fellowships for students in AI disciplines,
- supporting AI-focused programs in community colleges and innovative credentialing systems, and
- initiatives that encouraging graduate students to explore AI alignment, human-in-the-loop AI, and human-machine teaming.

Additionally, the federal government should explore non-traditional funding mechanisms, such as income-sharing agreements, to make AI education more accessible and diverse.

Support Public-Private Partnerships: To align academic learning with industry needs, appropriate federal resources should lead efforts to foster partnerships between educational institutions and AI-driven companies. These partnerships should:

- facilitate student collaboration with industry experts to enhance workforce readiness and
- expand to show measurable success in improving educational outcomes.

Appropriate federal resources should also facilitate collaboration between small enterprises and university AI research teams, to accelerate AI commercialization, driving economic growth and maintaining the U.S.'s competitive edge.

2. **Modernize and Develop a Competitive AI Workforce**

Building a globally competitive workforce requires skilled, capable and productive employees. To achieve a skilled workforce in an AI-powered world, the U.S. Government should:

Enable workforce upskilling and provide opportunities for the workforce to acquire, enhance and sustain skills to fully leverage AI technologies.

- Identify foundational AI skills (e.g., AI benefits, risks, automation bias, new security precautions); and domain-specific AI skills (e.g., call center, biomedical, transportation -- including domain-specific risks, and human-machine collaboration), to enable effective AI literacy and targeted upskilling.
- Explore AI-enabled tools, such as exoskeleton, or augmented vision for physically demanding jobs (for example: firefighters using exoskeleton footwear to combat muscle fatigue).

Sustain a competitive workforce by ensuring equal opportunities for all individuals to participate in the AI workforce.

- Fund federal research in Explainable AI.
- Develop metrics for equity and fairness in AI systems.
- Form coalitions across federal and state agencies, to create best practices maximizing participation across diverse groups in AI learning.

- Bolster diversification of AI design and deployment teams via federal engagement with diverse organizations and educational institutions.
- Promote federal proactive recruitment of STEM workers from diverse backgrounds.
- Incentivize international STEM graduates to remain in the United States, by reforming immigration laws to retain talent in AI, and related fields.

Require strategies that ensure workforce safety, as AI automates managerial duties

- Labor laws should ensure such decisions as reassignment or hiring are not solely determined by AI; and human managers oversee affected workers.
- Workers should have access to AI-collected performance data, with the right to correct inaccuracies.
- AI-driven decisions must be based on fair, accurate and legally contestable job-relevant information.

3. Provide Support for AI-Impacted and Displaced Workers.

Workers affected or displaced by AI should receive strong continuing education support and access to new career opportunities. We recommend:

- identifying sectors and job categories most vulnerable to AI displacement,
- encouraging federal agencies, NGOs and private sector stakeholders to develop programs that support displaced workers, while creating a pipeline of newly skilled talent for in-demand jobs (e.g., funding community colleges certification, micro credentialing, or vocational apprenticeships),
- requiring employers to assist displaced workers, by helping them find alternative positions, or offering free, or low-cost training. Encourage employers to provide retraining or education stipends during a reasonable notice period, to help workers transition to new careers, and
- researching and funding cost-sharing programs that provide displaced workers with a strong safety net -- including stable housing, healthcare, unemployment benefits, and education stipends for acquiring in-demand skills.

This statement was developed by the IEEE-USA Artificial Intelligence Policy Committee and represents the considered judgment of a group of U.S. IEEE members with expertise in the subject field. IEEE-USA advances the public good and promotes the careers and public policy interests of the nearly 150,000 engineering, computing, and allied professionals who are U.S. members of the IEEE. The positions taken by IEEE-USA do not necessarily reflect the views of IEEE or its other organizational units.