NATIONAL ACADEMIES Sciences Engineering Medicine

The Sunsetting of the Board on Science Education: A Public Hearing

or: How Society Learned to Stop Worrying and Love (and Trust) AI

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The Challenge

- **Men outnumbered women 2.75 to 1.00 in science and engineering (S&E) occupations and 8.50 to 1.00 in middle-skill occupations in 2021**. The only STEM occupation group in which women outnumbered men was S&E-related occupations (e.g., precollege science teachers and S&E technicians and technologists), with about twice as many women as men.
  - **Among workers with a bachelor's degree or higher whose highest degree was in an S&E field, 60% of female workers and 58% of Black or African American workers held jobs outside of S&E or S&E-related areas.**
- **Households with greater parent educational attainment or income report more exposure to science through children's activities**, such as school projects, than do households with lower educational attainment or income.
- As recently as 2020, a small percentage of American adults reported any recent experience with various science activities
  - participating in an online crowdsourcing activity for science data collection (3%)
  - helping a child with a science project either for school or outside of school (19%).

Summarized from Science and Engineering Indicators (https://www.nsf.gov/statistics/seind/)

https://techvify-software.com/generative-ai-examples/

What is AI?

An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment.

https://oecd.ai/en/wonk/definition

What Evolutions in AI are needed?

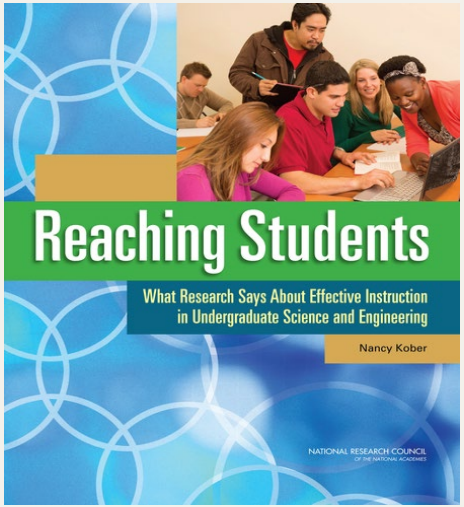
- Current State (Gen AI)
  - Can handle simple pattern recognition and classification tasks
    - Has the ability to do some complex classifications
  - Uses historical data to make predictions

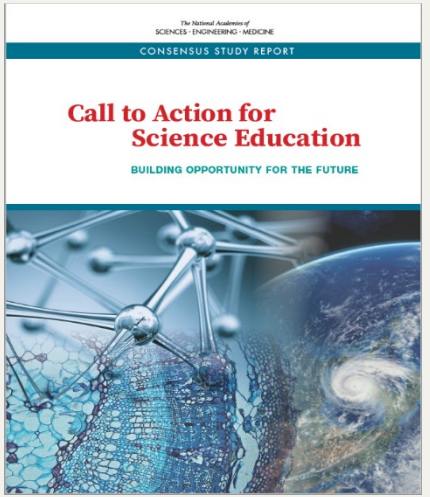
    .

- Future State (***Evolved AI***)
  - Improved ability around pattern recognition and classifications
  - Elimination of bias in predictions
  - Move from General AI to more specific applications
  - Ability to understand and classify real-time human actions, motivation and reasoning
    - This can lead a customized learning environment tied to an individual that can be validated against defined standards
    - Also allows us to connect what is measured/valued in formal learning environment to what occurs outside of them

What would ***Evolved AI*** would enable?

https://tek.forestry.oregonstate.edu/what-tek





The types and sources of science knowledge taught expands

What is human learning?

https://www.outputeducation.com/relevance-of-formal-learning-for-continuing-education-in-todays-workplace/

https://www.nsta.org/sites/default/files/2020-08/OctoberIssue_resized_2.jpg

More connections between human actions and scientific knowledge and expertise are uncovered

What ***Evolved AI*** enables. Some examples…

- Indigenous knowledge systems are integrated into mainstream STEM education, complementing and enhancing science education and understanding
  - The scientific and STEM knowledge of more people is recognized and celebrated, leading to a more representative STEM workforce
- Science becomes more participatory and would lead to more inclusive and longer-lasting solutions because it would bring in diverse perspectives.
  - understanding the relationship between forests, rivers, and weather systems leads to more sophisticated, adaptive approaches to climate resilience, flood management, and agriculture.
- Scientific literacy explodes across all age groups, but especially pre-K and post-workforce (55+)