AFFIRMATION

My partner and I affirm the resolution. Resolved: In the United States, the benefits of the use of generative artificial intelligence in education outweigh the harms.

C1: Generative AI Disseminates Education In The Case Of A Crisis

Education faces disruptions during crises, creating a gap that needs filling.

Engzell, Per, Arun Frey, and Mark D. Verhagen. "Learning loss due to school closures during the COVID-19 pandemic." National Academy of Sciences of the United States of America. April 27, 2021. https://www.jstor.org/stable/27040187. Accessed February 14, 2025.

During the pandemic-induced lockdown in 2020, schools in many countries were forced to close for extended periods. It is of great policy interest to know whether students are able to have their educational needs met under these circumstances and to identify groups at special risk. In this study, we have addressed this question with uniquely rich data on primary school students in The Netherlands. There is clear evidence that students are learning less during lockdown than in a typical year. These losses are evident throughout the age range we study and across all of the three subject areas: math, spelling, and reading. The size of these effects is on the order of 3 percentile points or 0.08 SD, but students from disadvantaged homes are disproportionately affected. Among less-educated households, the size of the learning slide is up to 60% larger than in the general population.

Generative AI can effectively step in during such disruptions.

Saavedra, Jamie, et al. "Educating for the present and the future: using Artificial Intelligence (AI) to address the learning crisis." World Bank Blogs. July 22, 2024. https://blogs.worldbank.org/en/latinamerica/artificial-intelligence-to-address-the-learning-crisis. Accessed February 14, 2025.

Can Artificial Intelligence (IA) help address massive education gaps? The answer is a cautious and optimistic yes. 1.8 billion students in the world should receive a good education. However, half of them do not achieve basic reading and numeracy skills needed for life. The learning crisis is so great that it could take decades to give everyone a decent education. But today, we are living in a unique juncture. Technology, and in particular AI, if used wisely, offers the opportunity to reach teachers, students, and schools with effective tools to enhance the educational experience at an

unprecedented scale. What is the potential of AI in education? Post-pandemic, many countries are implementing policies to improve connectivity (85% of countries, according to the Global Education Monitoring Report 2023), smartphones are almost ubiquitous, and 95% of the population lives within mobile internet coverage. While connection costs remain a significant hurdle that the World Bank along with international organizations and governments are trying to overcome, in this dynamic context, more schools and students will be connected, and AI-based solutions can help address the crisis.

IMPACT: This is key to mitigate impacts like those from the pandemic.

Hanushek, Eric and Ludger Woessmann. "The Economic Impacts of Learning Losses."

OECD. September 2020. https://www.oecd.org/en/publications/the-economic-impacts-of-learning-losses_21908d74-en.html. Accessed February 14, 2025.

Roughly speaking, research in the economics of education shows that each additional year of schooling increases life income by an average of 7.5-10%. In other words, a loss of one third of a school year's worth of learning would reduce the subsequent earned income of the pupils concerned by about 3%. Beyond crudely measured school attainment, the loss in cognitive skills resulting from school closures and the untested ways of re-opening is the larger issue. The different ways of estimating the economic costs of the pandemic for current students provide consistent estimates of today's learning challenges. The costs of school closure and the associated learning losses go beyond the lower incomes that this cohort of students can expect. A less skilled work force also implies lower rates of national economic growth. A loss of one-third of a year in effective learning for just the students affected by the closures of early 2020 will, by historical data, lower a country's GDP by an average of 1.5% over the remainder of the century. If the re-opened schools (which also involve new students) are not up to the same standard as before the pandemic, the impacts on future economic well-being will be proportionately larger.

Impact: Poverty is cyclical.

Hobbs, Steve. "Tending To The Spirit: A Proposal For Healing The Hearts Of Black Children In Poverty." University of Alabama School of Law, 2006, https://scholarship.law.ua.edu/cgi/viewcontent.cgi?article=1511&context=fac_articles. Accessed February 14, 2025.

Failing to meet the basic needs for survival negatively impacts the general well-being of poor children. Their families are under severe stress, which can cause depression and problems that impact family relationships. Poor households tend to have fewer resources for coping, especially those resources necessary for meeting the developmental needs (educational and social) of growing children. Consequently, school achievement is low because of delayed cognitive development and social and behavioral problems. Needless to say,

such children have limited job prospects that could lift them out of poverty. Compounding the problem further is the fact that poor teenagers have a much higher pregnancy rate, thus possibly extending the consequences of poverty to the next generation.

C2: Generative AI Personalizes Education

Generative AI can adapt for new learning outcomes.

Pesovsky, Ivica et. al. “Generative AI for Customizable Learning Experiences, Sustainability, April 5, 2024, https://doi.org/10.3390/su16073034. Accessed February 16, 2025.

We have created a tool within a pre-existing learning management system at a software engineering college that automatically generates learning materials based on the learning outcomes provided by the professor for a particular class. The learning materials were composed in three distinct styles, the initial one being the traditional professor style and the other two variations adopting a pop-culture influence, namely Batman and Wednesday Addams. Each lesson, besides being delivered in three different formats, contained automatically generated multiple-choice questions that students could use to check their progress. This paper contains complete instructions for developing such a tool with the help of large language models using OpenAI’s API and an analysis of the preliminary experiment of its usage performed with the help of 20 college students studying software engineering at a European university. Participation in the study was optional and on voluntary basis. Each student’s tool usage was quantified, and two questionnaires were conducted: one immediately after subject completion and another 6 months later to assess both immediate and long-term effects, perceptions, and preferences. The results indicate that students found the multiple variants of the learning materials really engaging.

Generative AI can create new content from patterns and datasets.

Binhammad, Mohammad Hassan Yousif et. al. “Investigating How Generative AI Can Create Personalized Learning Materials Tailored to Individual Student Needs.” Creative Education, July 2024, https://doi.org/10.4236/ce.2024.157091. Accessed February 16, 2025.

The Generative AI technology can be a game changer in modern personalized learning by offering customized learning materials for each student according to individual

specificities. Generative AI technology can compare and analyze student data (learning preferences, performance metrics, and engagement levels) and thus, create personalized materials that adapt to each student in the shortest period of time and in accordance with their current knowledge level. Consequently, the quiz system and the assessments are personalized in a way so that they become more difficult as students become more proficient in the subject matter. Not only that, generative AI may also develop individualized learning paths, integrating the content with learner's interests, objectives, and learning styles. An individualized approach to education may lead to increased student engagement and motivation, since students are more likely to be enthusiastic and active participants when the educational material aligns with their interests and goals.

Impact: A focus on engagement leads to better learning outcomes.

Randieri, Christian. "Personalized Learning And AI: Revolutionizing Education." Forbes Technology, July 22, 2024,

https://www.forbes.com/councils/forbestechcouncil/2024/07/22/personalized-learning-and-ai-revolutionizing-education/. Accessed February 16, 2025.

Significant advances in artificial intelligence (AI) are rapidly changing many aspects of our lives, including education. These changes come with benefits and challenges. Targeted learning experiences are gradually replacing once universally considered valid traditional teaching methods. AI enables these new methods to analyze vast amounts of data to personalize teaching. According to a study by Ptatam et al., AI is revolutionizing education by tailoring learning experiences to individual students' needs, increasing engagement and improving overall learning outcomes. The study conducted several surveys that yielded significant insights into the perceptions of AI in education.

Impact: Personalized learning use leads to better student performance in the long run

Arslan, Burcu et. al. "Opportunities and challenges of using generative AI to personalize educational assessment." Frontiers in Artificial Intelligence, October 6, 2024, https://doi.org/10.3389/frai.2024.1460651. Accessed February 16, 2025.

Personalized learning has been shown to enhance learner motivation, engagement, and performance (Bernacki et al., 2021; Walkington, 2013; Walkington and Bernacki, 2018, 2019). Personalization can be delivered via humans (e.g., students or teachers), digital assessment systems (e.g., via a virtual agent embedded in a digital platform), or a combination (e.g., recommender systems). In educational assessment, standardization has been one of the most essential requirements for fair and valid measurement (Sireci, 2020). However, more recent discussions put the learners in front and expect that personalized assessments yield similar benefits to personalized learning (Bennett, 2023; Buzick et al., 2023; Sireci, 2020). The transition from standardized to more personalized assessment of learning (i.e., summative assessment) and assessment for learning (i.e., formative assessment) comes with inherent challenges

in ensuring the validity, reliability, and fairness of more tailored, individualized Assessments.

Impact: Generative AI specifically improves educational outcomes.

Sari, Herva Emilda, Benekser Tumanggor, and David Efron. "Improving Educational Outcomes Through Adaptive Learning Systems using AI." International Transactions on Artificial Intelligence (ITALIC). November 2024. https://doi.org/10.33050/italic.v3i1.647. Accessed February 14, 2025.

The findings of this study demonstrate that AI-powered adaptive learning systems significantly enhance educational outcomes by providing personalized learning experiences. This improvement is evident in the substantial gains in post-assessment scores and the high satisfaction levels reported by participants. By tailoring content to individual needs, adaptive learning systems not only boost student engagement but also address learning challenges that are often overlooked in traditional teaching methods. This highlights the potential of AI to create a more inclusive and responsive educational environment. This research contributes to the fields of educational technology and AI by showcasing the effectiveness of adaptive learning systems across various educational contexts, from primary to higher education.

All in all, my partner and I affirm the resolution.