

# Reconsidering Education policy in the era of Generative AI

**G20 Policy Area:** Digital Governance, Security, and Connectivity

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## Abstract

Education systems around the world grapple with persistent issues related to equity, access, and quality, while also navigating the disruptions brought about by new technologies. These technologies, and specifically generative AI, offer a range of powerful applications, and present an opportunity to reimagine our education systems, but generative AI comes with its own set of unique concerns and challenges and its integration in education poses a significant challenge for educators, researchers, and institutions.

Governments worldwide need to develop robust and comprehensive regulations and policies tailored to the ethical use of AI in education to ensure that, amongst other things, student data privacy and overall well-being are adequately protected. Inaction by governments may mean significant consequences for students, educators, and society as a whole.

The future will belong to those who can understand and incorporate the use of emerging technologies like generative AI in everyday life. This paper is a call to action for the G20 and policy makers around the world towards shaping AI use in education in a way that is informed, transparent, and responsible.

## Introduction

Education today faces continued challenges around equity, access, and quality as well as new disruptions coming from emerging technologies - specifically generative AI. Across the globe, educators and leaders are rethinking how and what we teach, learn and assess in a way that prepares students well for the changing world of the future. An array of challenges faced in our current ecosystem limit its ability to enable the best possible education to all students.

These challenges are particularly prevalent around access, equity and quality of education, leading to widespread disparities in education outcomes and perpetuating social and economic inequalities. Emerging technologies though, and specifically generative AI, can have a significant beneficial impact on education outcomes and help to tackle these challenges if integrated effectively.

## **Education systems continue to face challenges in access, equity and quality**

Access to education remains a significant challenge, particularly in low-income countries and marginalised communities. Millions of children are unable to attend school or access education due to a lack of infrastructure, financial barriers, cultural norms and other factors. A UNESCO report estimates that 224 million children and youth are out of school globally, with low-income countries hardest hit. It is further estimated that children from the poorest 20% of families are eight times more likely to be out of school as children from the richest 20% in lower-middle-income countries. While the global out-of-school rate is gradually decreasing, this shift is too slow and large gaps still exist between different regions.

Equity in education is a different pressing concern, arising when disadvantaged students face significant barriers to educational success. These barriers include disadvantages based on socio-economic background, gender, ethnicity, and disability, as well as unequal access to resources such as well-trained teachers, textbooks, and technology. Disadvantaged students are more likely to attend poorly-performing schools, with fewer resources and less experienced teachers, while girls are twice as likely to be out of school than boys. Within this context of inequity, some educators, researchers and students have access to cutting-edge digital tools, capable and experienced experts and innovative pedagogical methodologies, while others make do with limited access to even the most basic educational tools, resources and educational delivery techniques. As a result, disadvantaged communities often have lower levels of educational attainment and fewer opportunities for future success.

The last focus of concern for this paper is around the provision of high-quality learning experiences that meet the needs of all students. Outdated curricula, inadequate teacher training and limited resources can all contribute to low-quality education outcomes. There is often a mismatch between the skills that students learn in school and the skills that are in demand in the labour market, leading to high levels of youth unemployment and underemployment. In classrooms teachers use a mix of digital and non-digital tools for their delivery, with their focus and time split between developing teaching plans and resources, delivering content, creating and grading assessments and coursework, in addition to other administrative tasks. A study conducted by EdWeek Research Centre shows that teachers work 54 hour weeks, with only half that time spent in student engagement like instruction, skill development and coaching. This leaves little room for thinking about enhancing and furthering the curriculum, student experience or providing specialised, tailored learning. The quality and appeal of teaching is variable - depending on the capabilities of the professionals and the training and resources available to them. Further consideration needs to be given to what students are being taught and assessed on, and how much of it relies on memorization of facts versus application of skills, thought processes and capabilities that can be extrapolated to a variety of situations and contexts.

## **The transformative power of AI can help resolve some of these challenges**

Generative AI technologies can help dramatically shift the landscape to address the gaps outlined above. The capability to ingest, interrogate and build connections within vast amounts of data allows generative AI to produce content such as text, images and sounds presents new opportunities and applications for educators, researchers, students and parents that can enhance their experiences. Generative AI can improve the quality of course materials and personalise them based on students' learning styles and specific needs, such as learning challenges and preferences. It can create simulations and virtual environments, resulting in more engaging courses. Additionally, AI can assist in creating new teaching materials and research content and produce images with specific modifications that respond to particular academic needs. The use of AI tools for such tasks frees up time for work that can potentially have more impact on the learning experience.

Given the ongoing speed of technology and societal change, content needs to be continuously refreshed, to remain relevant; generative AI can enhance the quality of outdated or low-quality materials leading to deeper understanding of the content and better outcomes for educators, students and researchers. It can be used to generate personalised learning materials and assessments for students, and it can create personalised assessments for students to test their knowledge and gauge their understanding of a topic. AI can offer virtual tutoring environments through chat bots and tutoring AI platforms, supporting students with real-time feedback and support outside of the classroom. This is especially useful for those who lack access to in-person tutoring or learning resources.

## **The use of generative AI brings concerns with it**

Despite many powerful applications, and the need to reimagine our education systems in the light of new disruptions, generative AI technologies do come with their own set of unique concerns and challenges. Here we outline some of the key issues before offering a perspective on policy changes to address them.

### **1. Academic Integrity, Ethics and Code of Conduct**

Students and researchers creating content using AI tools and calling it their own work is challenging academic integrity, ethics and code of conduct. Educational and research institutions around the world have employed various measures to address these issues, including requiring students and researchers to disclose their use of generative AI tools such as ChatGPT. However, this does not provide a clear solution as the outputs generated by AI tools are a combination of the system-generated content, developer inputs, and user edits. This creates a grey area in identifying and defining plagiarism and outlining sensible guidelines on AI use. While tools to detect whether content is created by AI are being developed and deployed,

their effectiveness varies and the sophistication of means and mechanisms to get around them will continue to evolve in parallel.

## **2. Knowledge Retention & Skill Development (Learning & Assessment)**

When skills development focuses on tool usage to access knowledge at the expense of expertise, a student's ability to think critically and build deep knowledge is impacted. Students are not able to assimilate knowledge without spending time with it, applying problem-solving and critical thinking techniques to dissect and analyse it. Research on the psychology of learning indicates that this is critical for students to absorb the content and develop crucial thinking strategies. However, the use of generative AI tools can sideline this type of learning, leaving students vulnerable to shallow thinking and lacking in fundamental understanding. It is important for students to predict, explain, and hypothesise to learn, rather than relying on ready-made answers that may only provide basic knowledge but fall short of critical, creative, and innovative thought. While the use of AI technologies will become a skill on its own, understanding how to build appropriate supporting knowledge and skillsets is important.

## **3. Bias, inaccuracy and privacy**

The content produced by generative AI tools is based on the data that was used to train it, which is raising concerns about potential bias, misinformation, lack of global understanding and overestimation of AI capabilities resulting in incorrect output. OpenAI, for example, has currently not disclosed details about the training methods and materials used for ChatGPT, making it a black box. Although large amounts of data may be used for training, it is essential to question the nature and origin of that data which is reflective of the types of biases and misinformation that could inflict harm. If the training material focuses heavily on certain geographical regions or particular views, this limits the likelihood of reliable, global and inclusive output required to cater to users, especially students in their formative years and researchers publishing their findings, across the globe. Recently the risk of AI systems being 'poisoned' by actors deliberately feeding them misinformation maliciously has been noted, leading to increased concerns about the accuracy and bias of AI outputs.

Privacy and transparency concerns have been top of the agenda in recent years, as members of society at all levels increasingly use technologies for day-to-day tasks, and sharing their data. There is not yet a clear view on how generative AI data is stored and handled, and for what purposes. The use of AI needs to be navigated cautiously given the potential involvement of minors and the disclosure of confidential information.

## **4. Further Risks to Access and Equity**

Generative AI technology has the potential to increase socio-economic divides due to accessibility and equity factors, which may disadvantage marginalised communities and limit their access to equitable opportunities. Communities that struggle with access to digital tools

and internet connectivity do not have the same level of access to technologies as better supplied communities. In addition, the data that is used to train the technology may not be representative or inclusive with respect to ethnicity, gender, or disability, making its use detrimental. It is important to recognise these issues and find ways to minimise any potentially negative impact of generative AI on education and society.

## **5. Training and Development**

In light of the challenges and concerns surrounding generative AI in education, its integration currently poses a significant challenge for educators, researchers, and institutions. The lack of education, training and guidance available for the responsible and ethical use of these tools, as well as limited understanding of their full capabilities and implications, contribute to this apprehension. Generative AI technologies are innovative and disruptive, but it is important to remember that they are not a replacement for the human mind. People working with them need to develop the right capabilities to make best use of them as tools to be used alongside human creativity and critical thinking, while being aware of their risks and acting accordingly.

## **Recommendations to the G20 and Policy makers**

As of now, there is no single comprehensive policy or regulatory framework in place that specifically addresses the use of AI in education. However, some existing regulations and policies that touch upon it, albeit indirectly, for instance, in the US, the Family Educational Rights and Privacy Act (FERPA) and Children’s Online Privacy Protection Act (COPPA) mandate that student data collected by technology providers should be kept private and secure. Likewise, in the European Union, General Data Protection Regulation (GDPR) provides a legal framework for the protection of personal data. These regulations also apply to the use of AI in education, as they regulate the collection, use, and storage of personal data in any context. Moreover, there are some emerging frameworks that aim to guide the ethical use of AI in education; for example, the OECD Principles on AI, the UNESCO Recommendation on AI and Education, and the AI4ALL program of the National Science Foundation, USA. However, these frameworks are still in their nascent stage, and their effectiveness in regulating AI use in education remains to be seen.

Governments worldwide can use these as a starting point but need to develop robust and comprehensive regulations and policies tailored to the ethical use of AI in education to ensure that student data privacy and overall well-being are adequately protected. They have a responsibility to promote the development and adoption of generative AI while also addressing the concerns articulated above. As the capabilities of generative AI (and other emerging technologies) continue to expand, policymakers need to develop a nuanced understanding of its benefits and risks, and enact policies that can effectively manage its impact on education systems and society at large.

## **Policy Consideration 1: Access and use in the teaching learning process**

Instead of an outright ban (like in the case of Italy - subsequently reversed - or Saudi Arabia) or allowing unrestricted use of generative AI in the classroom, policy makers (and institutions) will need to consider various scenarios in which use of generative AI will benefit students across different age groups and segments (K-12 vs Higher Education) and provide for inclusion of the technology in the teaching and learning process. Some well researched use cases can help provide teachers and students with guidance on how best to implement specific types of tools. This should be supported through the promotion of AI literacy among students and educators, incorporating AI-related topics such as machine learning, natural language processing, and neural networks into existing curricula. Policy makers need to ensure that AI led education tools are accessible to students of all backgrounds, emphasising diversity and inclusion in both the study and application of AI. A starting point here might be to shift emphasis from student/teacher content creation towards the evaluation of content to boost and develop critical thinking, for example, teaching students and teachers the importance of effective prompting.

## **Policy Consideration 2: Redrafting learning outcomes**

The use of generative AI in the day-to-day teaching and learning process could hinder the development of key skills like critical thinking and the ability to assimilate and analyse knowledge. Students need guidance on how to leverage technologies while retaining fundamental learning and development. The integration of AI tools creates an opportunity for educators and researchers to develop innovative approaches to teaching, assessment, and content development, thus enhancing the state of academia, for example generative AI can help to define tasks to ensure personalized learning for students. It will encourage a move away from less effective or more time-consuming tasks, such as memorization or reviewing large bodies of literature, to a model that promotes higher-order skills for educators, students, and researchers. This can be achieved, for example, by focusing on reflection on or discussion of created content rather than focusing on the creation of content itself.

## **Policy Consideration 3: Ethical framework for AI**

The development of an ethical framework for AI encourages its safe and responsible use, which can be provided through guidelines and standards that govern the design, development and deployment of AI technologies in education systems across schools and universities. The framework should cover aspects such as privacy, transparency, accountability, and fairness. It should support the declaration by AI systems of their design process so that the right systems can be identified which protect the privacy and personal information of students, teachers, and other stakeholders. While it is the responsibility of developers to carry out rigorous testing and validation of AI algorithms and ensure that they adhere to ethical and legal standards, educators also need to be adequately trained and equipped to handle the technologies and ensure that students' welfare is prioritised. Any framework should promote transparency and logic, ensuring

that AI models and algorithms are easy to understand and interpret, and outline use cases to be supported. It should be highlighted that frameworks for AI – like former ones for internet usage for example – cannot be fully enforced, but the objective here is to make students, parents and teachers aware of the guidelines and the implications of not adhering to them.

### **Policy Consideration 4: Data Privacy and Security**

The sensitive nature of personal information that is shared between students, teachers, and administrators during the learning process makes them vulnerable to cyberattacks and privacy breaches. Schools, universities and educational systems must take a proactive approach to address these concerns by instituting robust data privacy and security policies that protect the personal information of students, teachers, and staff.

Another critical area of concern is data governance. Schools and universities need to establish guidelines and protocols for the collection, storage, and sharing of data in ways that align with ethical and legal standards. They must ensure that they comply with applicable regulations such as GDPR (General Data Protection Regulation), FERPA (Family Educational Rights and Privacy Acts) and others as they evolve to cope with generative AI. A starting point may be to create default privacy and security processes with options for individuals to modify according to his or her preferences. Depending on culture as well as national and organizational priorities, there are opt-out and opt-in approaches that can be implemented.

### **Policy Consideration 5: Incorporating AI training for Educators and Students**

To fully leverage AI potential, educators need to be trained on how to integrate the technology into their teaching effectively. AI training should be included in teacher preparation programs and continued professional development. Teachers need to know how to identify appropriate AI tools, how to use them effectively, mitigate risk, and how to evaluate AI-generated content. Students should be taught basic AI concepts to be able to participate in the development of AI solutions in the future. Educators can incorporate AI training into the curriculum by developing courses and workshops to ensure students have practical experience using AI tools. As AI becomes more integrated into the educational system, it is important to prepare students for the jobs of the future. Governments can enable partnerships that provide industry-relevant training programs and provide financial incentives for schools that make AI and other emerging technologies available to underserved communities.

### **Policy Consideration 6: Promote transparency and accountability**

One of the most significant concerns related to the use of generative AI in education systems is the potential for bias and discrimination. To promote transparency, institutions need to be open about their use of generative AI systems, including the algorithms used and the processes

followed. Institutions should also provide explanations of how the technology works and how decisions are made based on the data collected. This transparency can help build trust between institutions, educators, parents, and students, and will help to ensure that the use of generative AI in education is ethical and unbiased. A mechanism is required to ensure that institutions and educators are responsible for the decisions made by the systems they use. For instance, if a student is penalised for a mistake made by a generative AI system encouraged by the school, that institution must be accountable for the error. Educational institutions need to establish clear guidelines, policies, and procedures for the use of these systems, including how they collect and analyse data, identify potential biases and ensure impartial decision making. In addition, institutions should routinely monitor and audit the generative AI system's performance to identify any errors or biases, and take appropriate measures to correct them. An important part of this is identifying the appropriate supervisory body or bodies to be involved, taking into account national and international approaches and guidelines.

### **Policy Consideration 7: Public engagement**

The use of AI in education raises ethical concerns such as privacy, data security, and fairness in decision-making. Public engagement, including with industry, allows for and encourages open discussion about these issues and provides an opportunity to address misconceptions and fears surrounding AI in education as well as building awareness which protects against manipulation. Public input and feedback can also inform the development of effective policies and guidelines that govern the use of generative AI in education. This helps to create a transparent and accountable framework for the deployment of the technology. Engaging the public in the decision-making process helps to build trust between the community and the institutions working with AI. This trust and inclusive attitude are important for the successful adoption and acceptance of AI in education.

### **Policy Consideration 8: Education led AI**

The education sector itself needs to be a leader in the development of its own AI based tools that build on this new technology and open the opportunities it offers to learners at all levels. In this way the sector can gain better control of contractual terms and technical and organisational measures in the application of AI. In addition, it will create a safer space for students to train in and make the institution both safer and more competitive. This does not mean that government or institutions need to become AI developers, but partnerships with ed tech and companies are a good starting point to develop bespoke tools, work through the ethical, behavioural and other challenges that are being raised, which will allow the sector to lead in this field rather than be reactive to what is to come.

## **G20's Role: Call to action for governments to take proactive and responsible steps to shape AI use in education**

Generative AI is here to stay and grow exponentially. According to a Forbes article published in March 2023, generative-relevant use cases already present a significant enterprise opportunity, with an estimated market of \$2.6 billion in 2023 which is expected to grow at a rate of 32% until 2026. As with previous disruptive technologies, such as calculators, computers and the internet, generative AI technologies will become another tool in the education ecosystem. We need to rethink how to learn, grow and develop in a world where generative AI is commonplace, be prepared for further transformations and we must do so while being aware of its uses and deficiencies, its strengths and limitations. This ongoing disruption demands proper guardrails in the form of forward-looking policy.

The G20 recognizes the importance of digital technology and its potential to enhance social development and economic growth. The G20 Digital Economy Ministerial Declaration acknowledged the need for policies that support the development and use of AI technologies while also addressing ethical and social considerations. The time is now to act on policy development, especially in education.

Generative AI has the potential to contribute to the achievement of the United Nations' Sustainable Development Goals (SDGs), particularly the achievement of SDG 4 which focuses on ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all, provided that the correct steps are taken now to integrate the use of this technology.

The G20 has an important role to play. By recognizing the potential of AI technologies, the G20 can create viable opportunities for the use of generative AI in education, provide recommendations to governments across the globe which impact policy and regulatory frameworks and help develop a common understanding of key ethical and 'human-centric' guidelines for the use of AI.

### **Risks of Inaction**

The future will belong to those who can understand, learn and incorporate the use of critical emerging technologies like generative AI in everyday life. Lack of understanding of AI and its applications will not only make students unqualified to enter the job market in the future, but will also broaden the divide between their skills, knowledge and abilities versus those who are adept at using AI tools. Traditional teaching methods and curricula may become outdated and education systems that are not able to integrate emerging technologies like generative AI into their educational systems risk producing graduates without the skills needed to succeed.

The digital divide may be exacerbated if governments do not actively invest in providing access to emerging technologies for all learners. Students from low-income or disadvantaged backgrounds may fall further behind in acquiring essential digital skills and knowledge. Countries that do not prioritise the adoption of new technologies in education may lose their competitive edge in the global market. By not preparing students with the skills needed for the AI-driven economy, these countries risk stunting their economic growth and development.

By not investing in emerging technologies, governments may hinder the development of new and effective teaching methods and learning tools. Teachers need training and support to effectively use new technologies in the classroom. Inaction in this area may lead to a lack of professional development opportunities for educators, making it difficult for them to adopt new tools and techniques.

Inaction from governments in the appropriate adoption of emerging technologies like generative AI in education can have significant consequences for students, educators, and society as a whole. By embracing, investing in and working on the best uses of these technologies, governments can help create a more equitable, effective, and innovative educational system that prepares students for the future.

## Note

While preparing this policy brief, we asked ChatGPT to prepare a similar document as a test. The work above required approximately 24 human hours to complete. The ChatGPT version took around 1 hour to complete with almost all that time spent on rephrasing questions to elicit more relevant content. We learned the following:

1. All readers of both papers picked the human based version as their preference (despite not knowing which was which)
2. The skills required to prompt ChatGPT are a new and rapidly growing discipline which we are learning in real time
3. The use of ChatGPT reduced the amount of learning significantly for the people involved. No reading, research or discussion was required, and no writing up reinforced learning whereas those that spent time on the human written version gained significantly more understanding and retained knowledge.

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