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International Forum on AI and Education

Ensuring AI as a Common Good to Transform Education

7-8 December 2021

Synthesis Report

Education 2030

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Executive Summary

The 'International Forum on AI and the Futures of Education: Ensuring AI as a Common Good to Transform Education' was co-organized by UNESCO, the Ministry of Education of the People's Republic of China, and the National Commission of the People's Republic of China for UNESCO. Building on the previous 'AI and the Futures of Education' forums, held in 2019 and 2020, this 2021 forum set out to explore the importance and role of digital humanism in AI and education. With people and governments worldwide becoming increasingly aware of both the potential and the challenges of AI and education, the forum engaged participants in dialogue about how AI governance and innovation can be enhanced for the common good. Forum participants included government ministers and other high-level ministry officials from Member States, together with representatives of international organizations, NGOs and academic institutions.

Realizing the potential and addressing the challenges of AI for education

Throughout the forum, participants acknowledged that Artificial intelligence (AI) has the potential to improve certain aspects of education but recognized that it does not provide a complete solution, in particular in areas where digital connectivity remains a challenge. In addition, it was agreed that the use of AI must meet the highest ethical standards, guided by humanistic principles, in order to ensure that AI fulfils the promise of accelerating progress towards the achievement of SDG 4.

Considering the digital as part of the global commons, UNESCO adopts a humanistic approach to technology in education that promotes respect for human dignity and is guided by human rights principles, namely inclusion, equity and gender equality. Recent developments in AI call for a reframing of what it means to be human and its implications for learning. The current context of transformation calls for a redefinition of what we understand by learning to be, learning to know, learning to do and learning to live together.

Teacher training and support are key for the use of AI in education, including for the implementation of AI curricula, as teachers increasingly have to be prepared to work in AI-rich settings. Accordingly, strategies for strengthening the capacities of teachers in the area of AI should be prioritized, while governments should enhance teachers' competencies in understanding and using AI to support teaching and to innovate new pedagogies.

Identifying and addressing the risks

Participants agreed that AI technologies should not be introduced to classrooms by default, but should only be introduced when it is demonstrably beneficial and ethical. Indeed, it is increasingly acknowledged that AI raises significant risks for information security, human rights and privacy – risks that have been amplified by private governance. It is therefore imperative that countries and international agencies together develop international standard-setting instruments

and national regulations to govern the use of AI, particularly for children. Measures to mitigate the ethical threats of AI should include advanced training for government officials and business representatives, as well as for teachers and school representatives.

A key area of concern is the impact of AI and education on gender inequality, which is rooted in existing digital divides yet is more complex, due to biased data and discrimination in algorithms. The school closures due to the COVID-19 pandemic both reaffirmed the importance of digital technologies and exacerbated existing inequalities, particularly the gender gaps in ICT competencies and skills. The gender equality ladder relating to AI and education starts with equitable access to AI, and encouraging women to study AI and participate in the AI industry: the participation and engagement of girls and women in designing and planning AI tools are key for ensuring their voices are heard and their needs are addressed.

Not only can AI data, if biased, and AI algorithms, if badly designed or misused, exacerbate existing discrimination, they can also incentivize violence, hate speech and exclusion. Accordingly, governments should develop appropriate regulations to protect users. However, regulations on their own will not be enough to ensure the safe and ethical use of AI in education or beyond. This requires all citizens to be equipped with basic AI knowledge, skills and values – while recognizing that AI literacy (data literacy and algorithm literacy) is necessary but not sufficient for ensuring that AI serves the common good.

The multiple connections between AI and education

AI and education is not just about the development of adaptive tutoring or other student-facing tools. It is also about collecting appropriate data and analysing it with algorithms to support teaching and learning, decision-making, and the management, assessment and monitoring of education. It is widely recognized that data mining and AI have the potential to improve education management and learning assessment, but this 'datafication' can also bring its own challenges. The risks related to the use of big data and algorithms should not be ignored, while the privacy, security, trust and fundamental rights of students, teachers and families must all be guaranteed.

AI in education also involves teaching about AI, its techniques and technologies, along with its potential impact on humanity. However, according to UNESCO's mapping, only 11 countries currently have government-endorsed K-12 AI curricula (none of which were in Africa), and only around 12% of time in these curricula was allocated to the social and ethical implications of AI, and there are few evaluations on the quality of AI curricula and the effectiveness of the implementation of the curricula. Local curricula are especially important given that countries share similarities but can be radically different from one another. Digital developments, in and around education, need to address and celebrate those differences – for example, algorithms need to be properly contextualized – while ensuring a humanistic approach.

Finally, participants agreed that governments around the world need to learn from one another, and need to develop effective partnerships with industry, academia, the commercial sector and NGOs, and to create a supportive ecosystem that attracts international expertise. They also need to counterbalance the private-sector-driven approach, reinforce the evidence base for quality and effectiveness of AI curricula, and facilitate the development and delivery of high-quality resources and teacher training.

Introduction

UNESCO forums on AI and education: a global platform for knowledge-sharing

Since 2019, UNESCO has been leading global efforts centred on the twin strands of artificial intelligence (AI) and education, aiming to ensure that (i) the introduction of AI into education is for the common good; and (ii) education systems teach the competencies needed for the AI era. These efforts formally began with UNESCO's flagship Mobile Learning Week being dedicated to the theme 'Artificial Intelligence for Sustainable Development' (UNESCO, 2019*a*).

In addition, the first International Conference on AI and Education was co-organized by UNESCO and the Government of the People's Republic of China in Beijing in 2019 (UNESCO, 2019*b*). It was here that the ground-breaking *Beijing Consensus on Artificial Intelligence and Education* was adopted (UNESCO, 2019*c*). To follow up on the implementation of the *Beijing Consensus*, the second international forum was held both online and in person in Beijing in 2020 (UNESCO, 2021*a*). In 2021, the third forum took place, again online and in person in Beijing, under the theme 'Ensuring AI as a Common Good to Transform Education'. Co-organized by the People's Republic of China's Ministry of Education and its National Commission for UNESCO in collaboration with UNESCO, this event set out to explore the importance and role of digital humanism in AI and education. In particular, with people and governments worldwide becoming increasingly aware of both the potential and the challenges of AI and education, the forum engaged participants in dialogue about how AI governance and innovation networks can be enhanced to direct AI to the common good.

Held on 7-8 December 2021, this third forum, which is the focus of this report, involved 73 speakers including ministers, vice-ministers and state secretaries from Cambodia, Côte d'Ivoire, Egypt, Indonesia, Mozambique, Namibia, Pakistan, the People's Republic of China, Portugal, Qatar, the Republic of Korea, Serbia, Slovenia, Sri Lanka, Thailand, Uzbekistan and Viet Nam. Presentations were also made by leading experts from UN agencies, NGOs, the private sector and international organizations. A total of 763 participants from 107 Member States took part. It was also live-streamed on YouTube (in English, French and Chinese) where it was watched by 1,063 international participants, and by the Chinese Ministry of Education's channel, which hosted 7,070 viewers. Together, the three international forums featured more than 200 speeches and presentations and reached more than 8,000 real-time international participants and viewers from more than 150 countries.[1] This series of forums has aimed to become a sustainable platform to promote knowledge-sharing and the achievement of international agreements in the field of AI and education.

1 Videos and speeches from the three international forums can be accessed via https://aiedforum.org.

'The purpose of UNESCO is to contribute to peace and security by promoting collaboration among the nations through education, science and culture…, [and] to realize this purpose, the Organization will collaborate in the work of advancing the mutual knowledge and understanding of peoples, through all means of mass communication, and to that end recommend such international agreements as may be necessary to promote the free flow of ideas by word and image…'

Source: UNESCO (1946)

Towards digital humanism

The forums took place against the backdrop of a global human development crisis, which was observed by the International Commission on the Futures of Education (2021) to include 'widening social and economic inequality, climate change, biodiversity loss, resource use that exceeds planetary boundaries, democratic backsliding and disruptive technological automation'. However, technological innovations can also create opportunities for humans to address these global challenges by changing the trajectory of our societies.

The development of AI is part and parcel of the digital transformation of all facets of our societies – from our daily lives to the world of work and public services including education. Most importantly, the AI-powered digitalization of learning is not only about the transmission of traditional forms of knowledge. Increasingly, it is also about the digitalization of knowledge production and representation, driven by machine learning, increasingly powerful algorithms, and other AI techniques. In general, the rapid growth of human-AI collaboration and the digital transformation of our societies have profound implications for what it means to be human and how people relate to each other and to technology. The traditional conceptions of humanism need to be reframed, and 'digital humanism' needs to be foregrounded to guide our education and development efforts.

In the *Beijing Consensus on AI and Education* and UNESCO's publication *AI and education: Guidance for policy-makers*, which was launched during this forum, the humanistic approach towards the use of AI is clearly articulated: 'the design and use of technology should be in the service of people to enhance human capacity, protect human rights and ensure sustainable development'. More fundamentally, a humanistic approach should frame technological innovation as a digital public good and as part of the global commons that must be freely accessible to all (Miao et al., 2021).

However, the current reality is that AI innovations are not yet adequately directed at the common good of humanity. For example, in a 2021 survey circulated to all Member States by UNESCO on the use of AI to support learning continuity and quality during COVID-19, only five countries reported that they had used AI tools in their education response to the crisis (UNESCO, 2021*b*). While there are increasing numbers of commercial AI tools being developed and implemented across institutions, there are very few AI tools

or practices orientated to the common good of education and humanity. Such tools and practices might include:

- **language- and image-processing technologies that enable inclusive and equitable access** to online learning opportunities for persons with disabilities or from linguistic or cultural minority groups;
- **big data and analytics** to improve the quality of learning, monitor long-term outcomes, and provide early identification of learners at risk of attrition so that timely support can be offered;
- **AI-powered tools to facilitate remote assessments** while empowering teachers and enhancing students' agency; and
- **regulations and strategies** to protect learners' and teachers' human rights, especially their data privacy, and to address other ethical issues such as gender bias in algorithms.

AI and the Futures of Learning

UNESCO released a global report on the futures of education, *Reimagining Our Futures Together: A new social contract for education*, at the 41st session of its General Conference in November 2021 (UNESCO, 2021*c*). In the same year, it launched the *AI and the Futures of Learning* project[2] focused on three complementary strands aiming to:

1 Identifying use cases and analysing trends on leveraging AI to address fundamental needs of learning, through producing a report on AI-enabled futures of learning, guided by *Reimagining Our Futures Together*. This strand of work will also build on UNESCO's *AI and education: Guidance for policy-makers* (Miao et al., 2021).

2 Develop ethical principles for the design, deployment and applications of AI in learning and education, building on the *Recommendation on the Ethics of Artificial Intelligence* adopted by the UNESCO Member States at the 41st session (UNESCO, 2021*d*).

3 Create guiding frameworks on the AI competences needed by all learners to live and learn with AI. A survey of AI curricula in schools has been completed under this strand of work, and the report was presented at the December 2021 forum.

In addition to the enhancement of the global and national governance of AI in education, one of the forum's main aims was to review AI's current use from the perspective of the fundamental need to support the higher-order thinking, creative learning and innovative pedagogy that may be required in the futures of learning.

2 See https://events.unesco.org/event?id=2883602288

Forum structure

The 2021 International Forum on AI and Education was structured around the following sub-themes:

- **Global governance and national policies on AI in education**
  This includes the debate on digital humanism in the context of the futures of education, and the sharing of experiences on how global governance and national policies can be enhanced and synergized to ensure that AI is used for the common good of humanity.
- **Ensuring AI as a common good for achieving SDG 4**
  This sub-theme encompasses knowledge-sharing on best practices and the effective use of trusted AI tools for education, and system-wide principles to guide the next generation of AI innovations to serve teachers and to enable the futures of learning. It also includes examining the definitions of AI literacies and AI curricula frameworks, and the conditions for facilitating their implementation.
- **Mining data to enhance education management and learning assessment**
  This covers the examination of emerging practices of data mining across platforms and multiple data sources to enhance education management, assess lifelong learning outcomes, and diagnose problems in learning systems; an evaluation of the limitations of using data and AI to support learning assessment; and the ethical issues relating to the use of data and AI tools to predict human behaviours, including data privacy and security, and algorithm biases.
- **Promoting gender equality and empowering girls and women with AI competencies**
  This sub-theme involves catalysing AI innovations to advance inclusion, equity and gender equality in education and sustainable development, especially among youth; ensuring that girls and women have equitable access to AI technologies and AI-enabled learning activities; facilitating debate on how to prevent gender discrimination in algorithms and AI tools; and sharing experiences on empowering girls and women with digital skills and AI competencies, as well as increasing their self-efficacy and participation in AI.
- **Promoting the humanistic use of AI in Africa: Build the partnership**
  This last sub-theme includes partnerships and programmes to support the building of the multi-layer and multi-disciplinary basis needed by African countries and other marginalized groups to maximize the potential of AI innovations, and develop the required infrastructure, open-source algorithms and tools, and competencies for key stakeholders.

Following a synopsis of the four opening forum speeches, each of these themes is presented as a synthesis of the ideas, information and views expressed in the sessions. The final section of this report is a synopsis of the follow-up actions recommended by three experts.

Opening speeches

The humanistic vision on the use of AI in education was validated and elaborated by the four opening speeches by **H.E. Mr Huai Jinpeng**, Minister of Education of the People's Republic of China; **Mr Santiago Irazabal Mourão**, President of the 41st session of the General Conference; **Mr Dong Qi**, President of Beijing Normal University (BNU); and **Ms Stefania Giannini**, UNESCO's Assistant Director-General for Education. Each of them spoke about the global challenges of ensuring the inclusive, equitable and ethical use of AI in education.

Mr Huai Jinpeng highlighted the importance of promoting inclusive, equitable and quality education for all as the fundamental prerequisite for using AI in education. In China, the national fiscal expenditure on education has accounted for more than 4 per cent of GDP for 9 consecutive years. In 2020, the gross enrolment rates for pre-school, high school and university students were 85.2 per cent, 91.2 per cent, and 54.4 per cent respectively; and the 9-year compulsory education consolidation rate was 95.2 per cent. As a result, the average length of education of the working population has reached 10.8 years, and is as high as 13.8 years for newer workers. Moreover, the illiteracy rate has dropped to 2.67 per cent.

Mr Jingpeng affirmed three principles for the educational reform and development of China. The first is an insistence on inclusion in education as the foundation of social equity. China adheres to the human-centred development ideology, bases its education policy on equity, and strives to narrow the gaps between urban and rural areas, and among different regions, schools and groups. Mr Jingpeng noted that in 2020 the goal of eliminating poverty in education was broadly achieved, and there was a considerable reduction in the problem of learners dropping out of compulsory education, which has plagued the country for decades. China continues to encourage the sharing of high-quality digital educational resources, and advance toward effectively bridging the digital divide.

MODERATOR

H.E. Mr Xuejun Tian
Vice Minister of Education and Chair of the National Commission of the People's Republic of China for UNESCO, People's Republic of China

SPEAKERS

H.E. Mr Huai Jinpeng
Minister of Education, People's Republic of China

Mr Santiago Irazabal Mourão
President of the 41st session of the General Conference, UNESCO

Mr Dong Qi
President, Beijing Normal University, People's Republic of China

Ms Stefania Giannini
Assistant Director-General for Education, UNESCO

The second principle is to adhere to a vision of high-quality education that the people are satisfied with. China is committed to enabling inclusive access and lifelong learning for all, that is relevant to all learners' needs as well as being open and flexible. Its government also aims to strengthen its technical and vocational education systems, and enhance the development of higher education and the capacities in research and innovation.

The third principle is to persist in reform and innovation. China is reforming assessment mechanisms and teaching practices, and validating the role of digital technology in transforming education. Sustainable programmes are being implemented nationally to accelerate the building of educational neo-infrastructure, promoting the model of 'Internet+Education' and supporting the deployment of technological innovation including AI to catalyse this transformation.

Mr Jinpeng then outlined three key areas that relate to the implementation of the *Recommendation on the Ethics of AI* and some aspects of *Reimagining Our Futures Together: A new social contract for education* (UNESCO, 2021*c*). The first area is China's planned release of a series of policies in response to the development of the new generation of AI, for which it will build an enabling ecosystem.

The second area focuses on the deep integration of AI into education and teaching. This involves initiatives for improving teachers' AI competencies and supporting them to adapt to the use of the internet and AI; innovating pedagogy and approaches to education management; strengthening the production of AI-related curricula; increasing the availability of AI talent; promoting the sustainable development of AI; and integrating AI into all types of education, at all levels, to boost students' digital skills and digital literacy.

The third area is the use of AI to promote lifelong learning for all. This involves constructing an education system in which schools, families and society collaboratively engage in teaching and learning; establishing long-term mechanisms that cater for the entire life course, such as 'banks of digital credits'; using technologies to protect the right to education for disadvantaged groups; exploring the effective integration of multiple learning pathways, methods and processes; and fostering a society that enables learning anytime, anywhere and for anyone.

Mr Jinpeng reminded participants that the world is facing major changes of a magnitude unseen for at least a century. To promote the common good in education, China is willing to work with other countries to advance global cooperation and promote the sharing of experience and wisdom. To this end, he made three recommendations. Firstly, educators and policy-makers should proactively review changes and respond to trends. At present, driven by new theories and technologies such as mobile internet, big data, supercomputing, sensor networks and brain sciences, the advances of AI have accelerated. New features include deep learning, interdisciplinary integration, human-machine collaboration, swarm intelligence and autonomous intelligence. Understanding these latest trends in AI and identifying the breakthroughs and priorities for developing top-level human resources in AI, should be a key mission for education.

Secondly, countries should collaborate through open knowledge sharing, speeding up the pace of digital transformation and intelligent upgrading, supporting international recommendations, and jointly building open, inclusive and resilient education systems. The third and final recommendation is to put safety at the foundation of developments and adopt a stable and long-term approach. The *Recommendation on the Ethics of AI* proposes that, throughout the life cycle of an AI system, measures should be taken to safeguard human beings, the environment and ecosystems (UNESCO, 2021*d*). Education needs to prepare the next generation for the future of human societies. For this reason, more rapid progress is needed to develop and optimize regulations on ethics and safety, and methods for technology deployment and management relating to the use of AI in education. Safety, as the cornerstone of technological transformation, should be solidified to ensure that AI will be used to promote learning and truly benefit human society.

Mr Santiago Irazabal Mourão also highlighted safety, asserting that while AI is likely to transform lives, it triggers many challenges that relate to important ethical issues such as transparency and privacy. The fast development of digital technology can unsettle local and regional standards and values. If misused, algorithms can exacerbate existing discrimination and incentivize violence, hate speech and exclusion. To tackle all these threats, it is essential to consider how AI can be designed for the common good. Education is the most powerful way to put this vision into action. In this regard, UNESCO took an important step to lead the way with the *Beijing Consensus on AI in Education* and the subsequent guidance report for policy-makers (Miao et al., 2021). As there are fewer than 10 years until the UNESCO Agenda 2030 deadline for providing quality education to all, the pace of change must be accelerated.

Next, **Mr Dong Qi** summarized three conclusions stemming from work undertaken in the field of AI in education by 1,000 researchers at BNU. First, cooperation on AI in education should be student-centred. AI needs to support students' learning, well-being and mental health holistically, rather than only focusing on their academic achievement. It could help students develop the lifelong learning and critical thinking skills that are needed in this era. Second, more attention needs to be paid to researching brain development to inform the design of AI in education with better understandings of students' cognitive needs. Third, new technologies such as AI can be harnessed to create systems where students receive individualized support to bolster their mental health, meanwhile generating information that can be used to improve teachers' practice. BNU's researchers will be continuing to work on these three aspects for the next decade and hope that their findings contribute to the 2030 Agenda for Sustainable Development.

Finally, **Ms Stefania Giannini** reminded participants that this forum was preceded by several historical milestones for UNESCO. These include the first International Conference on AI and Education in May 2019, the adoption of the *Recommendation on the Ethics of AI* by 193 Member States in November 2021, and the launch of the report *Reimagining Our Futures Together* (UNESCO,

2021*c*). A human vision runs through these standard-setting documents as a guiding principle on the use of technology. UNESCO's core values are to ensure that when adopting technology, human rights and human dignity are defended; inclusion, equity and gender equality are central; and innovation is considered a common good.

National regulations on data privacy protection must be developed to implement the *Recommendation*. At present, more than one-third of countries do not have any data protection laws. But regulations on their own are insufficient to ensure AI as a common good for education and for humanity. All citizens need to be equipped with some level of AI competency and the knowledge, understanding, skills and values to be 'AI literate', i.e. familiar with what is becoming a basic grammar in the 21st century.

To contribute toward the common good, AI must promote inclusion, equity and gender equality. Algorithms and data interpretation that are exacerbating gender discrimination and prejudice need to be addressed, and the spotlight must shine on supporting the development of AI infrastructure in Africa. Finally, the next generation of the internet, Web 3.0 – or a spectrum of frontier technologies converging under the 'metaverse' – is on the horizon. These innovations have to be steered in the direction of respecting the rights and needs of every learner; making education systems inclusive, innovative and equitable; and giving all learners the mindset, knowledge and humanistic values to shape a more sustainable future.

Global governance and national policies on AI and education

Introduction

It is increasingly acknowledged that the rapid deployment of AI across sectors potentially threatens human rights, exacerbates existing discrimination, and produces new forms of bias and exclusion. The intergovernmental agencies and public bodies of Member States are facing a significant rise in the private governance of AI, imposed by commercial technology providers. Developers, in this landscape, have defined and implemented normative systems in which their digital platforms operate. AI tools usually use algorithms to track users' data, detect patterns of behaviour, and assess users' practices without their full awareness or their explicit or genuinely informed consent. In addition to setting rules, these global corporations are increasingly acting as regulators and dispute-resolution arbiters when conflicts arise. In this way, ordinary people may be denied their human rights, and governments may be unable to represent their citizens. This rise of private governance undermines public accountability for making AI a common good, and leads to a legislative void with respect to the regulation of AI and data across sectors. This state of anomie has further amplified the risks that AI poses to human rights, data privacy, and information security, and increases the potential for the widespread distribution of hate speech and disinformation. Thus, there is a pressing need for global governance as well as national policies covering AI in education.

MODERATOR

Mr Sobhi Tawil
Director, Future of Learning and Innovation, UNESCO

SPEAKERS

H.E. Mr Branko Ružić
First Deputy Prime Minister and Minister of Education, Science and Technological Development, Serbia

H.E. Mr Zhong Denghua
Vice Minister of Education, People's Republic of China

LAUNCH OF THE PUBLICATION:
'AI and education: Guidance for policy-makers'

Mr Fengchun Miao
Chief, Unit for Technology and AI in Education, Future of Learning and Innovation, UNESCO

Mr Wayne Holmes
Institute of Education, University College London

Ms Maïmouna Sissoko Touré
KIX Africa 21 Hub Coordinator, Institute of the Francophonie for Education and Technical and Vocational Education and Training (IFEF)

Ms Mahra Hilal Al Mutaiwei
Director, Regional Center for Educational Planning (RCEP)

Mr Alexandre Barbosa
KHead, Center of Studies for Information and Communications Technologies (CETIC.br)

The *Recommendation on the Ethics of AI further* interprets the humanistic principles throughout the value chain of the design and application of AI, and across sectors and use cases (UNESCO, 2021*d*). It provides an intergovernmental instrument to support legislation to rebalance this governance landscape. The *Recommendation* still needs to be adopted and implemented through national regulations on AI and data protection. However, as noted in the previous section, less than two-thirds of countries around the world have privacy laws to ensure that citizens' data are under rigorous protections and controls.[3] Beyond such general regulations, policy-makers in the education sector need to deepen their understanding of the unique ethical issues arising from the use of AI in education, such as its reliance on particular pedagogies, and provide practical guidance on regulating the use of learners' data, preventing algorithm discrimination, curbing the use of intrusive AI tools, and promoting human agency in AI-supported learning settings.

The first session on this sub-theme was designed to help UNESCO facilitate the development of international regulations and strengthen national capacities for regulating the use of AI in education. The two speakers were **H.E. Mr Branko Ružić** from Serbia, followed by **H.E. Mr Zhong Denghua** from China.

Mr Ružić said that a report by PricewaterhouseCoopers (2017), *Sizing the Prize*, states that AI will contribute US$15.7 trillion to the global economy by 2030. Serbia is therefore strategically positioning its economy and people to be able to adapt to and harness AI, particularly through education. Serbia has adopted AI curricula and is currently developing more. Its institutes offer seven master's programmes in AI, providing 300 highly trained individuals to the industry every year. There are also training opportunities for traditional industries and small and medium enterprises. A guidance document for AI ethics is expected to be published in 2022, but ethics training is already part of all AI curricula, and is mandatory for all data officers. Education has been a main pillar and focus of development since the national AI strategy was adopted. Nevertheless, more specific applications and revised learning outcomes are being generated, and all existing curricula are continuously monitored for quality and relevance.

Next, **Mr Zhong Denghua** discussed how China's government has undertaken a series of initiatives for building a smart learning environment and exploring appropriate models for it, while also boosting the development of teaching teams and improving education governance capabilities. Specifically, these initiatives include:

3 See https://www.thalesgroup.com/en/markets/digital-identity-and-security/government/magazine/beyond-gdpr-data-protection-around-world

1 Guidelines for the construction of a new six-in-one educational infrastructure – network, platform, resources, campus, application and security – which will be driven by technologies such as AI and big data and built to stimulate digital transformation, intelligent upgrading and innovation.

2 The establishment of 18 'Smart Education Demonstration Zones' to promote the use of AI and other information technologies for updating concepts and exploring new models to foster high-quality learning and improve regional education levels.

3 The launch of pilot projects to develop teachers' AI competencies, in which 56 colleges and universities in 26 regions integrated intelligent technology and deployed teachers with AI competencies.

4 The implementation of the 'Social Experiment on Education under AI' in 10 regions and 19 educational bases, to explore paths toward the AI-enabled modernization of education governance. Furthermore, Guangzhou City and Wuhan City have piloted the integration of AI-related courses into primary and secondary school curricula, while 387 higher vocational colleges and 345 undergraduate colleges and universities have established AI majors.

What has been called the 'age of intelligence' (e.g. Shi, 2021) presents new challenges to the cultivation of students' abilities in innovation, communication, human-computer collaboration, and complex problem-solving, which have become essential. This calls for a transformation of the role of teachers and the approach to school governance. China's Ministry of Education focuses further on the use of AI in education in its forthcoming 'Fourteenth Five-Year Plan for the Digitalization of Education'. Its priorities will centre on 1) deepening the application of AI in education; 2) promoting AI in classrooms; 3) accelerating intelligent education management services; and 4) the ethical and security issues relating to the use of AI in education.

Launch of the publication *AI and education: Guidance for policy-makers*

Currently, *AI and education: Guidance for policy-makers* is available in six languages, and other translations are in progress. It was broadly welcomed by participants for supporting governance, the delivery of inclusive and equitable AI in education, and a critical approach to the impact of AI on real-world learning outcomes. To contribute toward the goal of digital humanism, the publication covers four main areas: AI essentials for policy-makers, key areas and emerging practices, challenges of leveraging AI to achieve SDG 4, and policy reviews and recommendations. A policy structure is proposed wherein AI in education initiatives should cover the following four interlinked aspects and key policy enablers or elements:

1 **Governing and regulating the use of AI in education**
This focuses on ethical issues such as protecting data privacy, preventing algorithm discrimination, regulating intrusive AI-powered tools, promoting human agency in the context of human-machine collaboration, and revealing uncharted ethical concerns.

2 **AI as a common good to deliver unfulfilled promises in education**
This aspect reaffirms that AI should

first be leveraged to address language barriers; meet the needs of learners with disabilities (e.g. sensory impairments, dyslexia and other reading difficulties, and autism spectrum conditions); and monitor learning challenges.

3 **AI as a public good to support pedagogies needed in the future**
This element involves reviewing the current status of the use of AI in education and recommends that it should move from automating low-skill tasks to supporting higher-order tasks and skills for learners.

4 **AI competencies as a cornerstone of the AI era**
Key recommendations under this aspect are presented in the UNESCO global survey on AI curricula for K-12 learners (UNESCO, 2021*b*).

High-level panel on global governance and national policies on AI and education

Panellists debated digital humanism in the context of the futures of education, and shared their experiences on how global governance of AI and national policies can be enhanced and synergized to ensure AI can be used for the common good of humanity and education.

During the COVID-19 pandemic, education suffered greatly in the countries taking part in this high-level panel. In general, technology was beneficial to the delivery of education. However, the lack of infrastructure and equipment in certain areas have caused unequal access. Partly to address these challenges, many countries are beginning to recognize AI as a core area of policy and are preparing to develop and adopt it, especially to support education, which they expect will lead to substantial economic progress. High priorities include training

HIGH-LEVEL PANEL

H.E. Mr Hang Chuon Naron
Minister of Education, Youth and Sports, Cambodia

H.E. Dr. Susil Premajayantha
Minister for Education Reforms, Sri Lanka

H.E. Mr Nguyen Van Phuc
Deputy Minister of Education and Training, Viet Nam

Ms Wajiha Akram
Parliamentary Secretary, Pakistan

H.E. Mr Ahmed Daher
Deputy Minister of Information Technology, Egypt

H.E. Mr João Costa
Deputy Minister of Education, Portugal

Mr Gong Ke
President, World Federation of Engineering Organizations (WFEO), the Executive Director of the Chinese Institute for the New Generation Artificial Intelligence Development Strategies, and the Chairman of the Academic Committee of Nankai University, People's Republic of China

H.E. Mr Jong-chul Jung
Vice Minister of Education, Republic of Korea

H.E. Ms Simona Kustec Lipicer
Minister of Education, Science and Sport, Slovenia

Mr Suphat Champathong
Permanent Secretary, Kingdom of Thailand

the AI engineers of tomorrow, while raising awareness of AI among teachers and students. Many countries are working to bring AI to classrooms in order to provide individualized learning opportunities and tailored teaching approaches, with the collected data being used to monitor how well the SDG goals are being met. However, translating policy into practice is difficult, and while technology can be valuable, it can also increase inequalities.

AI should be viewed as a tool, not a goal, and human intelligence should be prioritized over AI. Therefore, the key challenges include equity, information literacy, ethical implications, critical thinking, time management, and emotional regulation in the AI era.

In concert with UNESCO's *AI and education: Guidance for policy-makers*, some of the panel members revealed plans to further update their existing ethical guidelines. Panel members identified five main issues related to AI governance, namely that it needs to:

- be designed to safeguard human rights and achieve sustainable development;
- aim to foster AI innovation and development;
- be an open, multi-stakeholder system;
- use technology, regulations, education and other tools; and
- engage widely with teachers and students, ensuring their autonomy in teaching and learning.

Panellists also highlighted the importance of teacher training, infrastructure investment for the effective scaling of AI in education, improving curricula to enhance students' higher-order skills, and incorporating human-centred ethical standards.

Global governance and national policies on AI and education
Key takeaways and UNESCO commentary

- AI governance should safeguard human rights and achieve sustainable development; aim to promote AI innovation and development; be an open system for multiple stakeholders; use technology, regulations, and educational tools; and engage widely with teachers and students, ensuring their autonomy in teaching and learning.
- Without global governance and national policies, ordinary people may be denied their human rights, and governments may be unable to represent their citizens.
- AI governance is facing the rapid rise of private governance imposed by commercial technology providers, who are increasingly acting as regulators and dispute-resolution arbiters when conflicts arise. This amplifies risks associated with AI such as discrimination, bias, and the violation of human rights.
- AI tools usually use algorithms to track users' data, detect patterns of behaviour, and assess users' practices without their full awareness or their explicit or genuinely informed consent.
- The *Recommendation on the Ethics of AI* assists legislators in rebalancing the governance landscape. Regulations are needed for safeguarding learners' data, preventing algorithm discrimination, curbing the use of intrusive AI tools, and promoting human agency in AI-supported learning settings.
- UNESCO's *AI and education: Guidance for policy-makers* covers four key areas: the ethical and equitable use of AI in education, AI's potential to deliver unfulfilled promises, how AI can enable learning and digital humanism, and the AI literacy and skills needed for human-AI collaboration.

Ensuring AI as a common good for achieving SDG 4

Speakers noted that AI has been proposed as a key tool for helping Member States achieve SDG 4, ensuring quality education for all. It is true that AI and other innovations, such as blockchain and cloud technologies, are rapidly impacting education. For instance, in China, Cuba, Mexico and Spain AI is already being used to facilitate lifelong learning and equitable quality education for all. This requires a strong infrastructure, which is a key focus around the world, particularly in countries that have many schools in remote, rural areas. It also requires a humanistic perspective, a recognition that education involves affective, behavioural and cognitive dimensions and needs to be firmly grounded in the human and life sciences.

To give a few examples, China is taking a comprehensive approach to AI in the framework of its plan to modernize education by 2035; Spain has recently released a national AI strategy that integrates the public and private sectors; and Cuba, Qatar and Portugal have integrated AI elements into their respective ICT strategies and curricula. Governments' efforts and strategies are complemented by promising initiatives, such as those identified through a call for innovations launched by UNESCO, including:

- Lexplore[4] from the UK, which uses AI and eye-tracking technology to assess reading skills and identify potential barriers to

MODERATOR

Mr Fengchun Miao
Chief, Unit for Technology and AI in education, Future of Learning and Innovation, UNESCO

SPEAKERS

Mr Yang Zongkai
Vice president of China Education Development Strategy Society, Deputy Director of Expert Group on ICT in Education of the Ministry of Education, People's Republic of China

Mr Julio Albalad Gimeno
Director, National Institute of Education Technology and Teacher Development (INTEF), Spain

Mr Jorge Armando Barriguete Meléndez
Secretary General, Mexican National Commission for UNESCO, Mexico

Mr Alain Lamadrid Vallina
Director General of Information, Communication and Informatization, Ministry of Higher Education, Cuba

Mr Liu Pengzhao
Director, Qingdao Municipal Education Bureau, People's Republic of China

4 See https://www.lexplore.com

reading, especially for children who are dyslexic;

- An AI-informed smart learning ecosystem, developed by Hamdan Bin Mohammed Smart University[5] in the United Arab Emirates to offer individualized learning experiences;
- Domoscio from France,[6] which provides tools for adaptive learning and predictive analytics in STEM education and professional training, and offers individualization to students; and
- StorySign,[7] an app designed by the Chinese technology company Huawei to help children who have hearing problems learn to use sign language.

However, in general the pace is still too slow when it comes to developing policies and AI curricula at the national level, and evaluating initiatives in context to check whether they are effective and serve the common good. A greater sense of urgency is required.

The *Beijing Consensus* affirms that human interaction and collaboration between teachers and learners must remain at the core of education, and teachers cannot be displaced by AI systems. It calls on Member States and partners to ensure that teachers' rights and working conditions are protected when adopting AI systems. Regions and countries that have spearheaded the use of AI, including China, the Republic of Korea, and various European nations, have started to review teachers' roles and define the competencies needed in AI-rich

5 See https://www.hbmsu.ac.ae

6 See https://domoscio.com

7 See https://consumer.huawei.com/uk/campaign/storysign

IMPROVED LITERACY IN SCHOOL READING ASSESSMENT AND READING DEVELOPMENT WITH EYE TRACKING AND ARTIFICIAL INTELLIGENCE

Ms Angelica Rådman
Managing Director, Lexplore, Sweden

Ms Souma Alhaj Ali
Director of Excellence and Governance, Hamdan Bin Mohammed Smart University, United Arab Emirates

Mr Benoit Praly
Founder and President of Domoscio, France

UNESCO REPORT ON THE MAPPING OF AI CURRICULA

Mr Fengchun Miao
Chief, Unit for Technology and AI in education, Future of Learning and Innovation, UNESCO

AI CURRICULA FOR SCHOOL STUDENTS IN QATAR

Ms Noha Alomari
Education Specialist, Department of Curriculum and Learning Resources, Ministry of Education and Higher Education, Qatar

AI CURRICULA FOR SCHOOL STUDENTS IN PORTUGAL

Mr Hélder Pais
Head of the Curriculum Development Department, Directorate-General for Education, Ministry of Education, Portugal

LAUNCH OF THE UNESCO-KIDS CODE JEUNESSE PARTNERSHIP ON DATA AND ALGORITHM LITERACY INITIATIVE

Ms Roda Muse
Secretary-General of the Canadian Commission for UNESCO, Canada

Ms Kate Artur
Founder & CEO of Kids Code Jeunesse, Canada

settings. Training programmes for teachers should cover three components: AI literacy; knowledge and skills on domain-specific AI technologies adopted in local education settings; and skills in making pedagogical decisions based on AI-powered learning management systems and data analytics.

It is also necessary to implement training programmes to prepare teachers to work effectively with AI tools, and develop platforms that build on the belief that the quality of teachers is the most important factor in educational success. Countries also need to review evidence-based arguments relating to how AI might influence teaching and learning in the future, and integrate relevant skills into the training accordingly.

Nevertheless, regulations on their own are insufficient to effectively steer AI toward the common good. All citizens – not just those in schools – need to be equipped with some level of competency with regard to AI. This includes the knowledge, understanding, skills and values that might be called AI literacy. Countries also must help citizens develop advanced skills to meet the needs of new jobs created by the adoption of AI and foster local innovations. In fact, it is well-recognized that the most effective way to achieve this is to mainstream AI competency development in curricula for TVET and higher education institutions, as well as schools. However, the 2021 UNESCO report *K-12 AI Curricula*: *A Mapping of Government-Endorsed AI Curricula* found that only 11 countries reported having endorsed K-12 AI curricula (Armenia, Austria, Belgium, China, India, Kuwait, Portugal, Qatar, Republic of Korea, Serbia and United Arab Emirates), while an additional four (Bulgaria, Germany, Jordan and Saudi Arabia) were in the process of doing so (UNESCO, 2022).

These countries are leading the way in AI curricula, adopting a variety of mechanisms for developing AI curricula, including centralized government-led approaches, decentralized government-directed approaches, government-commissioned private provision, and private-sector-driven developments. But more should be done to ensure that approaches are human-centred, and AI is leveraged as a common good to accelerate the achievement of SDG 4. AI curricula are of utmost importance in allowing learners and teachers to acquire the fundamental combination of data literacy (understanding how AI collects, cleans, manipulates and analyses data) and algorithm literacy (understanding how the AI algorithms find patterns and connections in the data, which might be used for human-machine interactions). At the same time, advanced AI skills (including programming, contextual problem-solving, ethical and social issues, and AI techniques and technologies) should also be fostered.

A few recommendations are beginning to emerge. In addition to expediting the development of K-12 AI curricula and strengthening government validation to counterbalance approaches driven by the private sector, countries should pursue 'agnostic approaches' to AI brands and technologies. There is also a need to reinforce the evidence base supporting the quality and effectiveness of these curricula, as the monitoring of existing initiatives is still limited. The risks related to the massive use of data and specific algorithms to exploit

them cannot be ignored, and therefore the privacy, security, trust and fundamental rights of students, teachers and families must be guaranteed. There was also some consensus that teacher training and support remain the most important aspects of AI curriculum implementation, as teachers need to be prepared to work in AI-rich education settings and equipped with data-informed decision-making skills. It is also critical to adopt a human-centred approach and to ensure that teachers are not displaced by AI, as the quality of education remains dependent on the quality of teachers. Finally, at this special historical juncture, there is an urgent need to convene global and regional organizations, governmental agencies, private partners, academic researchers and practitioners to deliberate how AI governance and innovation networks can be mobilized to direct AI toward serving the common good for education and for humanity.

Ensuring AI as a common good for achieving SDG
Key takeaways and UNESCO commentary

- Humanistic approaches are necessary to ensure that AI fulfils the promise to accelerate progress towards the achievement of SDG 4.
- It is important not to lose sight of the key role of teachers in the educational process. Strategies for strengthening the capacities of teachers in the area of AI should be prioritized. Governments should enhance teachers' skills in using AI to deliver learning and innovate new pedagogy.
- Emotional learning and social interaction should not be displaced by AI.
- Basic AI literacy (a combination of data literacy and algorithm literacy) is necessary but not sufficient for directing AI toward the common good.
- According to UNESCO's 2021 mapping, only 11 countries reported having government-endorsed K-12 AI curricula, and none were in Africa. At this stage, there are few evaluations of the impact of existing AI curricula.
- Recommendations arising from the mapping include stronger government validation to counterbalance the private-driven approach, reinforcement of the base of evidence supporting the quality and effectiveness of AI curricula, and resource development and teacher training to facilitate curriculum integration.
- 'If you understand how algorithms work, you will have more power' (Kids Code Jeunesse video).[8]

8 See https://youtu.be/46AcviSU9Rg

Mining data to enhance education management and learning assessment

Speaker noted that data mining and learning analytics are increasingly being used to monitor learning processes, predict failure and attrition, enhance education management, assess lifelong learning outcomes, and diagnose major problems in learning systems. However, evidence for the effectiveness of these applications remains limited, and using data to support learning assessment raises numerous ethical issues relating to privacy and security as well as data and algorithm biases.

Ms Gabriela Ramos, UNESCO's Assistant Director-General for the Social and Human Sciences, noted in her presentation on the *Recommendation on the Ethics of AI* (UNESCO, 2021*d*) that technology should only be introduced in classrooms if it fully respects human rights, inclusion and diversity – yet data analytics can suffer from a lack of transparency and can thus violate some human rights. In fact, most AI and data analytics are not fully transparent: how do such systems make decisions and to what extent are they aligned with core values? Accordingly, the *Recommendation* calls for strict requirements to be met by systems that are used for monitoring and assessing abilities, or predicting learner behaviours. For example, the gathering of data should only be undertaken with the knowledge and consent of the data subjects, no matter their age, while all sensitive information must be fully secured and protected. The *Recommendation*

MODERATOR

Ms Natalia Amelina
Senior National Project Officer in Education, Chief of Unit of Teacher Professional Development and Networking, UNESCO IITE

RECOMMENDATION ON THE ETHICS OF AI

Ms Gabriela Ramos
Assistant Director-General for the Social and Human Sciences, UNESCO

H.E. Mr Rustam Karimjonov
Deputy Minister of the Public Education of Uzbekistan, Uzbekistan

Mr Khalid Abdulla Al-Ali
Assistant Undersecretary for Higher Education, Qatar

Mr Ir Nizam
Director-General for Higher Education, Ministry of Education, Culture, Research and Technology, Indonesia

Mr Zheng Qinghua
Vice President, Professor, Xi'an Jiaotong University, People's Republic of China

Mr Shahbaz Khan
Director of the UNESCO Beijing Office, UNESCO

ViLLE – A COLLABORATIVE LEARNING PLATFORM, WINNER OF THE 2020 UNESCO KING HAMAD BIN ISA AL-KHALIFA PRIZE FOR THE USE OF ICT IN EDUCATION

Mr Mikko-Jussi Laakso
Director, Centre for Learning Analytic, University of Turku, Finland

also identifies a clear need to help students gain the skills that will enable them to cope with these technologies – not only the basic skills of literacy, numeracy and coding, but also critical thinking, social-emotional skills and an understanding of ethics.

Data is also used to train AI tools that can potentially enhance the quality of learning, and it is important to recognize that progress in these applications might be slowed if data protection is especially restrictive. The implementation of a data-driven approach to education management raises complex questions: what data should be collected, where should it be collected from, how is it best analysed, how might it be protected, how can it be used ethically to inform practice, and what will its impact be? Therefore, the effective use of data requires significant investment in the training of all educational stakeholders, from teachers to policy-makers, covering all of these issues.

AI and data can also be used to assess learning and learner engagement, and identify students likely to drop out. For example, ViLLe[9] is a Finnish web platform that provides gamified learning paths in mathematics and computational thinking. Its content is aligned with Finland's curriculum requirements, and it has been shown by its developers to improve student performance by 12 per cent and arithmetic fluency by 11 per cent, over 15 weeks of use. However, as with most initiatives of this type, there is no independent evidence or comparison with other interventions to evaluate learning gains. A second example is OU Analyse.[10]

PREDICTIVE LEARNING ANALYTICS: AN EMPOWERING TOOL AT TEACHERS' FINGERTIPS

Ms Christothea Herodotou
Associate Professor, The Open University, United Kingdom

Ms Toyosi Akerele-Ogunsiji
Social Entrepreneur in Data Science and Artificial Intelligence Education, Nigeria

CONCLUDING REMARKS

Mr Tao Zhan
Director, UNESCO IITE

This is an analytics platform that can predict short-term outcomes (e.g. whether students will submit an assignment on time) and long-term outcomes (e.g. whether they will complete or pass their course), based on data drawn from their interactions with the learning management system. Teachers can use the system to identify which students will benefit from their intervention. The developers have found that the more teachers use the system, the more the outcomes improve, but again the system has not been independently evaluated.

9 See https://en.learninganalytics.fi/ville

10 See https://analyse.kmi.open.ac.uk

Mining data to enhance education management and learning assessment
Key takeaways and UNESCO commentary

- Data mining and learning analytics are increasingly being used to monitor learning processes, predict failure and attrition, enhance education management, assess lifelong learning outcomes, and diagnose major problems in learning systems.
- The *Recommendation on the Ethics of AI* calls for strict requirements to be met by systems that are used for monitoring and assessing abilities, or predicting learner behaviours.
- Evidence for the effectiveness of these applications remains limited, and using data to support learning assessment raises numerous ethical issues, including privacy, security, and algorithm biases.
- The developers of AI in education need to make sure that their systems are transparent, so that the extent to which they are aligned with core values can be understood.
- Technology should only be introduced into classrooms when it is demonstrably beneficial and ethical – if it fully respects human rights, inclusion and diversity.
- Data should only be collected with the clear knowledge and consent of the data subjects, no matter their age.
- All sensitive personal information must be fully secured and protected.
- Data-driven education raises complex questions: what data should be collected, where should it be collected from; how is it best analysed; how might it be protected; how can it be used ethically to inform practice; and what impact will it have?
- All education stakeholders should be given professional training so that they know how to ensure that data mining and learning analytics are both effective and ethical.

Promoting gender equality and empowering girls and women with AI competencies

Speakers noted that the gender gap in digital competencies and skills is becoming wider. In the least developed countries, only 19 per cent of women use the internet compared to 31 per cent of men (ITU, 2021). Women and girls are 25 per cent less likely than men to know how to leverage digital technology for basic purposes, 4 times less likely to know how to program computers, and 13 times less likely to file for a technology patent (EQUALS and UNESCO, 2019). For these reasons and more, the 37th session of UNESCO's General Conference resolved to make gender equity a priority of the Organization, building on the *Priority Gender Equality Action Plan, 2014-2021* (UNESCO, 2019*d*). In 2019, an updated plan was published, entitled *From access to empowerment: UNESCO strategy for gender equality in and through education 2019-2025* (UNESCO, 2019*e*). This action plan proposes a three-step ladder for promoting gender equality, especially relating to technology in education:

Step 1: Eliminate gender inequality in access to digital devices;

Step 2: Empower women and girls with digital skills; and

Step 3: Increase women and girls' self-efficacy in the study of technology and participation in related industries.

MODERATOR

Ms Justine Sass
Chief, Section of Education for Inclusion and Gender Equality, UNESCO

Ms Lindiwe Matlali
Commissioner for the Fourth Industrial revolution, Founder and CEO of Africa Teen Geeks, South Africa

Ms Blerta Cela
Deputy Regional Director, UN Women Regional Office for Europe and Central Asia, Turkey

Ms Nighina Azizov
Programme Analyst, Ending Violence Against Women, UN Women Moldova Country Office, Moldova

Mr Steven Vosloo
UNICEF Digital Policy Specialist, Office of Global Insight and Policy, UNICEF, United States

Ms Shahed Dergham
Teens in AI Ambassador, Syria

Ms Wang Qiong
Professor of Educational Technology, Peking University, People's Republic of China

Ms Corinne Schillizzi
NTT DATA, Italy

Mr Simon Zhang
Chief Brand Officer, StorySign, Huawei, People's Republic of China

In recent years, many countries have focused on improving access to education. However, this can have the unintended consequences of undermining equity, inclusion and overall quality. Children are a particularly vulnerable group who deserve special provisions and attention in the development of AI policies, frameworks and concrete actions. UNICEF recently released the second version of its flagship document *Policy guidance on AI for children*, which includes nine requirements for child-centred AI. In particular, it acknowledges the importance of the participation and engagement of the beneficiaries in designing and planning AI tools in order to guarantee that their voices are heard and their needs are addressed (UNICEF, 2021). This also includes women and girls, and people with disabilities. Everyone is affected by AI, so it is necessary to work with all disadvantaged groups to ensure that no one is left behind.

In addition, AI in the wrong hands can be used to facilitate violence and perpetuate gender stereotypes. Beyond generic training, there should be targeted activities for boys, men and whole communities aimed at reducing digital violence. An example of promising practices directed at preventing violence against women and girls is the Better Futures project in Moldova, which uses a combination of AI, virtual reality and psychological insights to improve behaviours in the long term.

Nonetheless, AI has the potential to assist teachers to become better facilitators in ways that a classic teacher-training programme cannot. For example, the Ms Zora platform[11] in South Africa is a robotics and coding software tool designed to help teachers detect educational problems, improve learner performance, and automate administrative processes by serving as both a teacher's assistant and a learner's personal tutor.

Positive role models in gender equality are key, as is conveyed in the maxim that 'you can't be what you can't see'. It is important to increase access to mentors and role models to help learners understand what AI studies and careers are, and disrupt stereotypes about the role of women in technology. Training programmes should centre on female educators, entrepreneurs and business owners. Such advocacy, visibility and training efforts are necessary also to address the persistent issue of lower perceived self-efficacy among women and girls when dealing with technology. At the same time, partnerships with the private sector should be pursued to generate opportunities for innovation that benefit women and girls, and disadvantaged populations in general. Good examples presented during the forum included:

- The Girl Geek Summit by African Teen Geeks,[12] which exposes young girls to the world of STEM careers, under the tutelage of top-tier local and international female leaders in the industry; and
- Girls in AI Hackathon by TeensInAI,[13] an initiative that aims to inspire and empower girls and young people from under-represented communities across the world to get involved in the field.

11 See https://africateengeeks.co.za/portfolio/mszora

12 See https://africateengeeks.co.za

13 See https://www.teensinai.com

Promoting gender equality and empowering girls and women with AI competencies Key takeaways and UNESCO commentary

- Everyone is affected by AI: it is necessary to work with under-represented groups, especially women and girls, to ensure that no one is left behind.
- It is important to disrupt stereotypes about the role of women in technology, and address the persistent issue of women and girls' lower perceived self-efficacy in this area.
- There should be equitable access to technology and empowerment of girls and women with digital skills and AI competencies, along with their increased representation and greater availability of female mentors in technology industries.
- The end beneficiaries of AI developments, especially those who are often poorly represented (e.g. children, women and girls, persons living with disabilities, and economically disadvantaged groups) should be encouraged and facilitated to participate in the design and development of AI.
- Technology can perpetuate gender stereotypes, and in the wrong hands can even facilitate violence against women and girls. Preventing violence against women depends on establishing training for boys and men.
- Improving gender equity and inclusion is as important as improving access to education.

Promoting the humanistic use of AI in Africa: Build the partnership

At the 37th session of UNESCO's General Conference, at which *Priority Gender Equality* was adopted, another strategy, *Priority Africa at UNESCO: An operational strategy for its implementation, 2014-2021*, was adopted and then launched the following year. It was updated and renewed in 2021 to feature a specific flagship programme on 'Harnessing new and emerging technologies for sustainable development in Africa, including through the implementation of the *Recommendation on the Ethics of Artificial Intelligence*' (UNESCO, 2021*e*). Core objectives of this flagship programme include:

- Improving African countries' capacities to adopt and implement AI;
- Enhancing the capacity of all AI actors in Africa to advance solutions that are ethical, and assess the impact of AI on individuals, society and the environment;
- Enhancing gender equality in the development and use of AI systems;
- Assisting in building inclusive knowledge societies in Africa by mainstreaming open educational resources; and
- Fostering digital skills and competencies, and overcoming the knowledge and digital divides.

MODERATOR

Mr Abdoulaye Ibrahim
Programme Specialist, Priority Africa Coordination Division, UNESCO

INTRODUCTORY REMARKS

Mr Firmin Edouard Matoko
Assistant Director-General for Priority Africa and External Relations, UNESCO

H.E. Mr Albertus Aochamub
Ambassador Extraordinary and Plenipotentiary of Namibia to France, Permanent Delegate, Chairperson of the Africa Group, Namibia

MINISTERIAL STATEMENTS

H.E. Mr Daniel Navigara
Minister of Higher Education, Science and Technology, Mozambique

H.E. Ms Mariatou Koné
Minister of National Education and Literacy, Côte d'Ivoire

Mr Vincent Adul
Communications Technology Expert, Ministry of ICT, Innovation and Youth Affairs, Kenya

Speakers noted that the continuing importance of *Priority Africa* for education was highlighted during the COVID-19 pandemic. Around the world, including in Africa, when schools were closed, digital technologies became a crucial lifeline for accessing distance learning. However, as revealed by the UNESCO-UNICEF-World Bank (2020) joint

surveys, the dearth of broadband connectivity in the least developed countries, including many across the African continent, left one-third to one-half of all learners without access to any distance learning opportunities.

As evidenced by the *Strategy on Technological Innovation in Education (2021-2025)*, adopted at the 211th session of the Executive Board in April 2021, UNESCO is committed to mobilizing resources and providing capacity development to support Member States in planning and managing technology-enabled flexible and crisis-resilient learning systems. The *Strategy* also commits UNESCO to strengthening capacity in the use of big data in learning management systems and stimulating the development of a global data commons. These together will facilitate human rights-based, safe, and ethical sharing of trusted data and algorithms that can help improve teaching and learning (UNESCO, 2021*f*).

However, the use of digital technologies, especially AI, should not be allowed to negatively impact cultural diversity. Each country in Africa is unique, and a digital-humanistic approach requires this wide diversity of cultures to be both catered for and celebrated. In particular, stakeholders need to recognize that the transferability of current algorithms is weak, meaning that algorithms based on data from one group of users cannot be used directly to solve similar problems for groups in other contexts. This causes problems for transferability among nations within the same region but also between developed and developing countries. In other words, algorithms trained on data outside of Africa will inevitably lead to inaccurate predictions, recommendations and decisions. Nonetheless, there is the hope that developing countries who adopt AI later, can learn some lessons from the early use of AI, and direct algorithms to the common good in education.

If African countries are to close the digital and economic divides between them and other countries around the world, they cannot wait for countries from the global north to do what is needed. Instead, they should learn from one other and exchange experiences, knowledge and perspectives. They should also encourage cross-border cooperation and collaboration, in order to build an AI ecosystem across academia, civil society and commerce, and develop effective humanistic AI strategies and frameworks specific to their needs. However, Africa can never close the digital divide alone if they do not have access to the latest technological innovation. Therefore, partnerships are key. For example, international organizations need to help African countries meet the huge challenge of rolling out universal access to the internet across the continent, while AI developers should make their algorithms open and adaptable to the local contexts.

At the same time, African nations need to develop their own local human capacities. This requires a digital transformation that is committed to human rights and is contextualized, to ensure that they do not just consume AI but can guide and inform its effective and ethical development – all of which depends on providing children across Africa with equitable and inclusive access to education. However, as noted earlier, fewer than ten countries among all the UNESCO Member States are implementing governmental AI curricula for school students,

and none of these are from Africa (UNESCO, 2022). AI curricula are not just about the tools that might be used in classrooms. They should also involve value orientation, knowledge and skills to ensure that citizens are literate on key topics such as AI ethics, to train the next generation of AI practitioners. This will generate a critical mass of expertise in Africa.

Privacy and security of data also needs to be carefully considered. Even though cloud-based computing has been promoted as an efficient approach, it has also triggered the issue of 'data sovereignty': how can national institutions maintain the sovereignty of their local data and compliance with national laws and governance structures, when the data are stored in cloud platforms controlled by foreign or private owners? Discussion and experience-sharing are needed to help governments balance cloud-based AI deployment with local ownership of platforms and data.

This part of the forum involved two round table sessions, one on private and institutional partnerships, and the other on academic partnerships.

Round table 1: Partnerships for Africa, involving private and institutional partners

Participants concluded that it is essential to develop an ecosystem that involves international expertise and international synergies but is firmly rooted in Africa and focused on lifelong learning for all. Potentially, Africa has an opportunity to leapfrog the early adopters of AI, as it did with mobile telephones, and can do this in a smart way. For example, at least one project, M-Shule[14]

14 See https://m-shule.com

ROUND TABLE ON PARTNERSHIPS FOR AFRICA: PRIVATE AND INSTITUTIONAL PARTNERSHIPS

Ms Amal El Fallah Seghrouchni
Head of AI movement, The International Center of Artificial Intelligence of Morocco, University Mohammed 6 Polytechnique (UM6P), Morroco

Mr Li Tianchi
CEO, CODEMAO, People's Republic of China

Ms Mona Laroussi
Director, Institut de la Francophonie pour l'éducation et la formation (IFEF), Senegal

Ms Claire Mongeau
Co-Founder & CEO, M-Shule, United Kingdom

ROUND TABLE ON PARTNERSHIPS FOR AFRICA: ACADEMIC PARTNERSHIPS

Ms Rita Bissoonauth
Head, African Union International Center Girls and Womens' Education in Africa (AU/CIEFFA), African Union Commission, Burkina Faso

Ms Ikram Chairi
Mohammed VI Polytechnic University, Morocco

Mr Wang Quan
Vice president, Professor, Xidian University, People's Republic of China

Mr Li Ming
Director, UNESCO International Centre for Higher Education Innovation (ICHEI)

Mr Huang Ronghuai
Professor, Beijing Normal University, People's Republic of China

Ms Helene Charpentier
Senior Project Officer, Association for the Development of Education in Africa (ADEA), Côte d'Ivoire

CONCLUDING REMARKS

Mr Yue Du
Director, Priority Africa Coordination Division, UNESCO

which is based in Kenya, uses AI-powered SMS messages on basic phones to deliver education rather than depending on high-speed broadband access, which is still frequently unavailable, especially in rural areas of Africa. However, it is critical to ensure that AI is not just a new way to deliver traditional education, but that it enables innovation and new approaches to teaching. In short, AI offers the opportunity to develop a new educational paradigm. Finally, governments must recognize that all teachers will need training on how to use AI, data and data traces; and how to apply ethics so that AI enhances gender equality instead of harming it.

Round table 2: Partnerships for Africa, involving academic partners

While Africa faces many challenges, it also has a unique opportunity. More than 2,000 languages are spoken across the continent and there is an abundance of raw talent. In fact, Africa has one of the world's fastest-growing populations, with 60 per cent of its population currently being under 25 years old. To take advantage of the potential within this extraordinary pool of people, governments in Africa need to develop partnerships between academia and civil society. These partnerships should aim to enhance citizens' AI competencies and build their capacities within a human rights context; develop appropriate, localized, and constructive regulations; help young people, especially young women, become the leaders of tomorrow; and identify the deep educational challenges that AI might tackle, not just the sorts of shallow problems that AI developers often tend to focus on. Across all of this, it is essential that countries in Africa adopt UNESCO's humanistic principles that prioritize inclusion, diversity, and human rights. One proposed approach is to deliver hybrid classes, on education, science and the humanities, using AI and educational technologies to support teachers.

Promoting the use of AI in Africa: Build the partnership
Key takeaways and UNESCO commentary

- During the COVID-19 pandemic, the unavailability of broadband connectivity in the least developed countries, including countries across Africa, left almost half of all learners without access to any learning opportunities.
- AI should not be seen as just a new way to deliver traditional education. Instead, AI offers the opportunity to develop a new paradigm.
- AI must not be allowed to negatively impact cultural diversity. Each country in Africa is unique, and a digital-humanistic approach requires this wide diversity to be catered for and celebrated.
- AI algorithms based on data from developed countries cannot be used directly to solve problems in developing countries. However, as later adopters, developing countries can learn lessons from the early adopters, helping them to direct algorithms to the common good in education.
- Countries in Africa need to learn from one other and exchange experiences, knowledge and perspectives, while encouraging cross-border cooperation and collaboration.
- AI curricula should involve value orientation, knowledge and skills to ensure that everybody in Africa becomes AI-literate on key topics such as ethics.
- Governments and international organizations must address concerns around data sovereignty where data are subject to national laws and governance structures yet are stored in cloud platforms controlled by foreign owners.
- Africa can never do this alone; partnerships with international organizations (e.g. UNESCO and the ITU) and private sector providers are key.

Follow-up actions

In closing the forum, three speakers set out what they saw as desired actions, points of consensus, and recommendations that had emerged from the discussions. First, **Mr Firmin Edouard Matoko**, UNESCO Assistant Director-General for Priority Africa and External Relations, said that as a long-term partner of UNESCO, China is committed to supporting the implementation of the Priority Africa Operational Strategy through the China Funds-in-Trust project on Higher Education in Africa for a technical and innovative workforce. Its commitment also contributes to the UNESCO-Huawei project to build technology-enabled crisis-resilient school systems, and the UNESCO Prize for Girls' and Women's Education.

Then **Mr Zhou Zuoyu**, Vice President of BNU, recommended that with the help of AI, education should be redefined. Education helps to transmit knowledge and know-how from one generation to the next, but with AI affecting learning, teaching and assessment, it is now important to focus on protecting humans and promoting humanism to ensure that technology benefits everyone. That, he continued, is a major challenge for everyone. Barriers must be overcome, while full advantage is taken of all the opportunities that new technologies offer, in order to provide a decent way of life for everyone and protect our freedoms. In 2020, BNU adopted a plan to train all of its professors and student teachers, so that they can all contribute effectively to international developments, particularly those enabled by AI. As a world-leading university, BNU endeavours to help peer countries to find innovative methods and teaching environments and progress toward a peaceful world for all.

MODERATOR

Mr QIN Changwei
Secretary General, National Commission of the People's Republic of China for UNESCO, People's Republic of China

SPEAKERS

Mr Firmin Edouard Matoko
Assistant Director-General for Priority Africa and External Relations, UNESCO

Mr Zhou Zuoyu
Vice President, Beijing Normal University, People's Republic of China

H.E. Mr Tian Xuejun
Vice Minister, Ministry of Education, People's Republic of China

Next, **H.E. Mr Tian Xuejun**, China's Vice Minister of Education, reaffirmed his belief that the outcomes of the forum will make positive contributions to the implementation of the 2030 Agenda. As a strategic technology stimulating a new scientific and technological revolution and industrial transformation, AI has shown great potential in shaping the future of learning. The outbreak of COVID-19 has posed severe challenges to the development of global education since 2020. New technologies and hybrid online and offline teaching models have been applied on a large scale, methods and approaches have been continuously innovated, and the

integration of AI technology and education has deepened. These two years of practice have enriched our understanding of the future of education and the innovative application of AI and other emergent technologies in this field.

Three points of consensus achieved during the forum were then summarized. First, **policy guidance needs to be strengthened to enhance the integrated development of AI and education**. Digital technology, represented by AI, will lead to a revolution in education. At this critical historical moment, the initiative should be taken to strengthen policy guidance at the national and global levels for the well-being of humankind. On the one hand, developments in technology and education should be integrated, while on the other hand, safe practices must be developed to guarantee that AI-driven educational reforms benefit all citizens.

Second, **equity and inclusion must be the guiding principles for the development and application of innovative AI technologies in education**. UNESCO's *Recommendation on Open Science* and *Recommendation on the Ethics of AI* should both be implemented in order to vigorously promote the openness of online educational resources and the humanistic deployment of AI (UNESCO, 2021*g*; UNESCO 2021*d*). Theoretical research and practices must be strengthened to prevent discrimination in algorithms and AI tools and make sure that girls and women, people with disabilities, and individuals living in poverty have equitable opportunities to participate in AI-supported learning activities. Moreover, disadvantaged groups should be empowered with AI competencies so that they can fully participate in the era of AI.

Third, **international cooperation should be enhanced to prevent a new digital divide**. The concept of a community with a shared future for humankind must be upheld, adhering to the principles of consultation, contribution and shared benefits. More resources need to be mobilized to build human capacity in developing countries, especially in Africa.

Lastly, the speakers proposed three main recommendations for the way forward. The first was to **capture the 'golden key' of innovation and make AI an important driving force for educational reform**. AI technology changes rapidly and has broad development prospects. It is important to be mindful of its revolutionary impact and constantly deepen and expand theoretical research on the integration of AI with education. Key areas for this include the reform of education governance systems, the upgrading of schools, the iteration of teaching methods, and the improvement of talent cultivation methods through new technologies. It is important to focus on the building of an intelligent system for lifelong learning, thereby providing inexhaustible impetus and lasting support to the development of education.

The second recommendation was that **global and national governance should ensure the ethical and effective application of AI in education**. UNESCO's reports have set out a vision for realizing a peaceful, just and sustainable future through educational transformation and an ethical framework for

AI technologies. Based on the international consensus, it is important to mobilize all the involved parties to properly tackle the risks and challenges of digital fairness, safety, and ethics. Positive interactions should be enhanced: people to people, people to society, and people to technologies, using intelligent technologies to optimize configuration, closing the digital divide, enabling education to truly serve the common good of all people.

The third recommendation was that **an 'overpass' of cooperation needs to be built, making AI a priority topic for international exchanges and collaboration in education**. In response to the major opportunities and complex challenges brought by the new technological revolution, such coordination is the only way forward. UNESCO should spearhead extensive teamwork at the global, regional, North-South, and South-South levels, to actively increase the technical dialogue and shared benefits of quality resources in pursuit of the 2030 Agenda for the development of education worldwide.

Finally, and in summary, it was acknowledged throughout the forum that AI has positive potential for education but does not provide a complete solution to education's global problems. In short, AI brings multiple challenges, and should only be introduced in classrooms when it is demonstrably beneficial. Throughout the forum, participants were also in agreement that, for it to contribute to the common good of all, AI in educational contexts must meet the highest ethical standards, guided by humanistic principles, ensuring human rights, human dignity, inclusion and equity. All of this depends on teachers, government officials and business representatives receiving appropriate training and support to enhance their AI competencies and to make them aware of the possible impacts on humanity so that these might be effectively mitigated. It also depends on international standard-setting instruments and national regulations to govern the use of AI, to counterbalance the private-sector-driven approach, along with locally-sensitive humanistic AI curricula.

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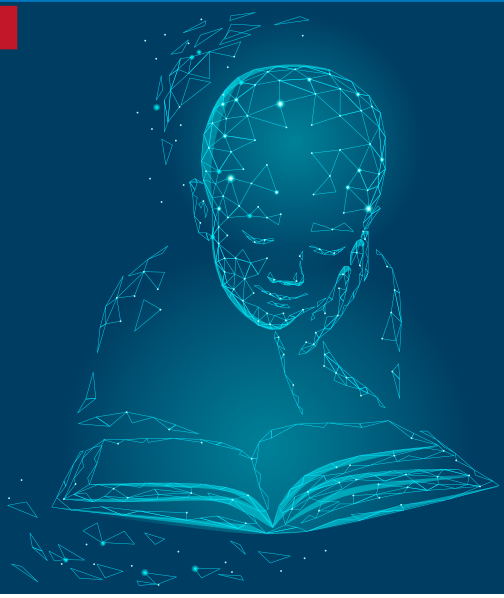
Appendix: Concept note

International Forum on AI and Education

Ensuring AI as a Common Good to Transform Education

7-8 december 2021



#AIED2021

Background

Towards digital humanism: Directing AI innovation towards the common good

As summarized by the International Commission on the Futures of Education,[1] we are in the midst of a global human development crisis: "widening social and economic inequality, climate change, biodiversity loss, resource use that exceeds planetary boundaries, democratic backsliding and disruptive technological automation are the hallmarks of our current historical juncture." Technological innovations bring key opportunities for humans to address these global challenges by transforming our lives and changing the current course of the development of human societies.

1 https://unesdoc.unesco.org/ark:/48223/pf0000375746

The development of Artificial Intelligence (AI) is part and parcel of the digital transformation of all facets of our societies – from our daily lives to the world of work and to public services, including education. Specifically, the AI-powered digitalization of learning is not only about digital transmission of 'traditional' forms of knowledge. It is also increasingly about the digitalization of knowledge production and representation, driven by machine learning and increasingly powerful algorithms. In general, the rapid growth of human-AI collaboration and the digital transformation of our societies have profound implications for what it means to be human and how we relate to each other and to technology. The traditional conceptions of humanism need to be reframed, and a digital humanism is being defined and will guide our education and development efforts.

In the *Beijing Consensus on AI and Education*[2] and UNESCO's recent publication, *AI and education: Guidance for policy-makers*,[3] the humanistic approach towards the use of AI has been clearly articulated: the design and use of technology should be in the service of people to enhance human capacity, protect human rights and ensure sustainable development. More fundamentally, a humanistic approach should frame technological innovation as a digital public good for all and as part of the global commons that must be freely accessible to all.

However, AI innovations are not yet adequately directed at the common good of humanity. In a 2021 survey circulated to all Member States by UNESCO on the use of AI to support the learning continuity and quality during the COVID-19 crisis, only five countries answered positively to the use of AI tools in the education response to COVID-19. Apart from commercially driven AI platforms, there are limited AI tools and AI in education practices orientated to the common good of education and humanity, including: (1) regulations, strategies or tools for protecting learners' and teachers' human rights as well as data privacy; (2) the use of language- and image- processing technologies to enable inclusive and equitable access to online learning opportunities for persons with disabilities and from linguistic and cultural minority groups; (3) the use of data analytics to improve the quality of learning and enable development of interdisciplinary competencies; (4) the use of AI-powered tools to support remote summative assessments and high-stake examinations; and (5) the use of big data to monitor long-term learning outcomes and to provide early warning of education dropouts.

Global governance of the use of AI in education

The rapid deployment of AI across sectors potentially threatens data privacy and human rights, exacerbates existing discrimination, and produces new forms of bias and exclusion. In terms of the governance of AI, the inter-governmental governing bodies and the public governance of Member States are facing the rapid rise of private governance imposed by the commercial AI technology providers. Private AI developers, especially owners of digital platforms, have defined and implemented private normative systems. The algorithms – used by AI tools to track

2 https://unesdoc.unesco.org/ark:/48223/pf0000368303

3 https://unesdoc.unesco.org/ark:/48223/pf0000376709

users' data, recognize behavioural patterns and rate users' practices – are usually implemented without users' full consciousness and explicit consent. In addition to being the rule-setters, the private owners of AI tools are also taking on the roles of regulators of the rules and the resolution bodies when conflicts occur among users and between AI providers and users. The rise of the private governance undermines the public governance that is accountable to make AI a common good.

The Recommendation on the Ethics of Artificial Intelligence adopted by the 41th session of the UNESCO General Conference in November 2021 will therefore provide an instrument to support legislations to rebalance this governance landscape. The Recommendation still needs to be adopted and implemented through national regulations on AI and on data protection. However, up to now, there are still more than one third of countries around the world without any forms of privacy laws for data protection to ensure that citizens' data are offered under rigorous protections and controls.[4] Beyond the general data protection regulations, policy-makers in the education sector need to deepen their understanding of unique ethical issues relating to the use of AI in education, and further provide practical guidance on regulating the use of learners' data, preventing algorithm discrimination, curbing the use of intrusive AI tools, and promoting human agency in AI-supported learning settings. It is therefore imperative for UNESCO to facilitate the adoption of international regulations and strengthen national capacities in regulating the use of AI in education.

AI as a common good for Africa, gender equality and marginalized groups: The basis to build

When schools were closed during the COVID-19 pandemic, digital technologies were the crucial lifeline for accessing distance learning opportunities. During and after the pandemic, digital technologies have become a social necessity to ensure that education as a human right is not disrupted. However, the UNESCO-WB-UNICEF joint surveys revealed that the unavailability of broadband connectivity in the least developed countries left one-third to a half of all learners without access to any distance learning opportunities.

The 211th session of the UNESCO Executive Board adopted UNESCO's Strategy on Technological Innovation in Education (2021 – 2025). The Strategy pays particular attention to UNESCO's global priorities of gender equality and Africa, and places further priority focus on the most vulnerable groups, including persons with disabilities. Through the Strategy, UNESCO is committed to: mobilizing resources and providing capacity development to support Member States in planning and managing technology-enabled flexible and crisis-resilient learning systems; and strengthening capacity in the use of big data in learning management systems and promoting the development of a global data commons to facilitate human rights-based,

4 https://www.thalesgroup.com/en/markets/digital-identity-and-security/government/magazine/beyond-gdprdata-protection-around-world

safe and ethical sharing of trusted data and algorithms that can help improve teaching and learning.

A profound and robust foundation needs to be built if the digital divide is to be closed and the developing countries are to catch up with the AI revolution. This includes:

- **Building AI infrastructure and enhancing country ownership**

This includes promoting universal access to internet connectivity and cloud computing centres with national ownership. Even though cloud-based computing has been promoted to be a more efficient solution, it has also triggered issue on "data sovereignty", which relates to how national institutions can maintain the sovereignty of their data when the data of local groups subject to the national laws and governance structures are stored in cloud platforms controlled by foreign or private owners. With this issue, debates and experience-sharing are needed to balance cloud-based AI deployment and the country ownership of AI platforms and data.

- **Addressing the dilemma between protecting private data and mining data as a public good**

While it is critical to ensure the private ownership of learners' personal data, an extremist approach to data protection will lead to the absence of data available to train AI tools that are potentially a public good to enhance the quality of learning. For example, ViLLE,[5] an AI-powered learning platform developed by the University of Turku of Finland, the Laureate of the 2020 edition of UNESCO Prize for ICT in Education, uses learners' data to monitor learning outcomes and provide early warning for possible dropouts. International knowledge sharing is urgently needed on how countries can possibly address the data dilemma.

- **Designing algorithms relevant to the challenges of local education systems**

The transferability of current algorithms is weak, meaning that algorithms based on data of one group of users cannot be used directly to solve similar problems of groups in different contexts. Developing countries, as late adopters of AI in education, can learn lessons from the early adopters about failing algorithms and direct algorithms at the common good in education. More importantly, developing countries should build locally relevant AI systems using open-source algorithms. One of the examples is M-Shule[6] – or "mobile school" in Swahili from Kenya – one of the first personalized knowledge-building platform developed in Africa to connect learners via SMS to tailored learning, evaluation and activation. For this to happen, international organizations are obliged to promote open-source algorithms.

- **Developing AI competencies and AI literacy**

Regulations on their own are insufficient to ensure AI will be steered for the common good, so all citizens need to be equipped with some level of competency with regard to AI. This

5 https://www.learninganalytics.fi/en/ville

6 https://m-shule.com

includes the knowledge, understanding, skills and value orientation that can be called AI Literacy. Developing countries also need to develop human resources with advanced AI skills to meet the needs of new jobs created by the adoption of AI and to foster local AI innovations. The most effective way is to mainstream AI competencies development in national curriculum for schools, TVET institutions and higher education institutions. However, according to the recent survey conducted by UNESCO on governmental AI curricula for schools, fewer than ten countries among all the Member States are implementing governmental AI curricula for school students, and none of these are from Africa.

- **Preparing teachers to work in AI-rich education settings**

The Beijing Consensus affirms that human interaction and collaboration between teachers and learners must remain at the core of education, and teachers cannot be displaced by AI systems. The Consensus calls on Member States and partners to ensure that teachers' rights and working conditions are protected when adopting AI systems. Leading regions and countries in AI, including China, the Republic of Korea and European countries, have started to review teachers' roles and to define the required competencies in AI-rich education settings. Training programmes have been developed and implemented to prepare teachers to work effectively with AI tools and platforms. Developing countries also need to review evidence-based arguments about how AI might influence teaching and learning in the future, and integrate relevant skills into training programmes.

The Beijing Consensus and the international conferences on AI and education

To support education policy and planning in the era of AI, UNESCO, the Ministry of Education of the People's Republic of China, and the National Commission of the People's Republic of China for UNESCO co-organized the first International Conference on AI and Education (Beijing, May 2019), and the International Forum on AI and the Futures of Education dedicated to a theme on the development of AI competencies (online and in-person meeting in Beijing, December 2020). The Conference in 2019 resulted in the first international consensus on AI and education, the Beijing Consensus.

The Beijing Consensus recommends that UNESCO reinforce its leading role in AI and education across concerned sectors and mobilize the Organization's institutes and networks, and further expand its external networks in the field of AI and education with relevant partners. The Ministry of Education of the People's Republic of China has expressed its commitment to sponsor and co-organize the international event on AI and education annually with UNESCO until an agreement on the termination of the partnership is reached.

The knowledge shared during the Forum of 2020 was published in the *Synthesis report on developing competencies for the AI era*.[7] Building upon the two international events, UNESCO published *AI and Education: Guidance for policy-makers* in April 2021 with an aim to foster AI-ready policy-makers. UNESCO will take the opportunity of this planned International Forum of 2021 to launch the publication in six UN languages. Following up on the outputs of the Forum of 2020, UNESCO launched the project on AI and the Futures of Learning[8] to work on three independent but complementary strands: (1) a report proposing recommendations on AI-enabled futures of learning, (2) a guidance on ethical principles on the use of AI in education, and (3) a guiding framework on AI competencies for school students. In this context, a survey on AI curricula for school education has been completed, and the report will be presented in this planned International Forum of 2021.

Meanwhile, after adopting the Strategy on Technological Innovation in Education in October 2021, UNESCO will adopt Recommendation on the Ethics of Artificial Intelligence and release the global report *Reimagining Our Futures Together: A new social contract for education* at its 41th session of the General Conference in November 2021. At this special historical juncture, there is an urgent need to convene global and regional organizations, governmental agencies, private partners, academic researchers and practitioners to deliberate on how AI governance and AI innovation networks can be enhanced to direct AI at the common good for education and for humanity.

Aim

In response to this need, the Ministry of Education of the People's Republic of China, and the National Commission of the People's Republic of China for UNESCO will co-organize with UNESCO an online edition of the International Forum on Artificial Intelligence and Education on 7 and 8 December 2021 under the theme *Ensuring AI as a Common Good to Transform Education*. The online Forum will deliberate on how AI governance and AI innovation networks can be enhanced to direct AI at the common good for education and for humanity.

Subthemes

The Forum will be structured around the following sub-themes:

1 **Global governance and national policies on AI in education –** Deepen the debate on digital humanism in the context of the futures of education, share experiences on how global governance of AI and national policies can be enhanced and synergized to ensure AI can be used for the common good of humanity and education, and launch UNESCO's report *AI and education: Guidance for policymakers*.

7 https://unesdoc.unesco.org/ark:/48223/pf0000377251

8 https://events.unesco.org/event?id=2883602288

2 **Ensuring AI as a common good for achieving SDG 4 -** Promote proven best practices and effective use of trusted AI tools for education; explore the system-wide principles to guide the nextgeneration of AI innovations to serve teachers and to enable the futures of learning; present the results of the UNESCO surveys on governmental and non-governmental AI curricula for school education, share knowledge on defining AI literacies and frameworks on AI curriculum as well as on preparing teachers to work in AI-rich settings.

3 **Mining data to enhance education management and learning assessment -** Examines the emerging practices of mining data across platforms or multiple data sources to enhance education management and public service, assess lifelong learning outcomes, and diagnose the major problems of learning systems; assess the limitation in using data and AI to support learning assessment and ethical issues relating to the use of data and AI tools to predict human behaviours including data privacy and security, and algorithm biases.

4 **Directing AI innovations at inclusion, equity and gender equality in education –** Catalyze AI innovations to advance inclusion, equity and gender equality in education as well as sustainable development especially among youth; promote gender equality to ensure that girls and women have equitable access to AI technologies and AI-enabled learning activities; facilitate debate on how to prevent gender discrimination in algorithms and AI tools; share experiences on empowering girls and women with digital skills and AI competencies, and increasing their self-efficacy and participation in AI areas.

5 **Promoting the use of AI in Africa: Build the partnership** – Focus on partnerships and well-resourced programmes to support the building of the multi-layer and multi-disciplinary basis needed by African countries and other marginalized groups to maximize the potential of AI innovations including building AI infrastructure, promoting open-source AI algorithms and AI tools, and developing AI competencies for key stakeholders.

Target Participants

The participants will include Ministers of Education and/or ICT, senior policy-makers, experts from international organizations, representatives of private sector partners and civil society organizations, prominent academic researchers, and managers of selected AI in education projects.

Co-organizers

The Forum is co-organized by:

- United Nations Educational, Scientific and Cultural Organization
- Ministry of Education of the People's Republic of China

- National Commission of the People's Republic of China for UNESCO

The following institutes are providing support in hosting the Forum:

- Beijing Normal University
- UNESCO Institute for Information Technologies in Education

Financial support has been provided by:

- National Commission of the People's Republic of China for UNESCO

Working Languages

Interpretation services will be provided in English, French and Chinese.

Provisional Programme Structure

(CET Time, Paris Time)

<table>
<tr><th colspan="2">Day 1 (7 December 2021)</th><th colspan="2">Day 2 (8 December 2021)</th></tr>
<tr><td rowspan="3">09:30-11:30</td><td rowspan="3">Opening Session
and
Session 1:
High-level panel on global governance and national policies on AI in education
Sign in</td><td>09:00-10:30</td><td>Session 3:
High-level panel on mining data to enhance education management and learning assessment
Sign in</td></tr>
<tr><td>10:30-11:00</td><td>Break</td></tr>
<tr><td>11:00-12:30</td><td>Session 4:
Promoting gender equality and empowering girls and women with AI competencies
Sign in</td></tr>
<tr><td>11:30-12:00</td><td>Break</td><td>12:30-13:00</td><td>Break</td></tr>
<tr><td rowspan="2">12:00-14:00</td><td rowspan="2">Session 2:
Ensuring AI as a common good for achieving SDG 4
Sign in</td><td>13:00-14:30</td><td>Session 5:
Promoting the use of AI in Africa: Build the partnership
Sign in</td></tr>
<tr><td>14:30-15:00</td><td>Closing Session
Sign in</td></tr>
</table>

Session 1 - High-level panel on global governance and national policies on AI in education is scheduled back to back with the Opening Session, and presents speeches of high-level speakers of international organizations and ministers on how global governance of AI can be enhanced by the cross-border adoption and implementation of international regulations, as well as on how national strategies on AI and education are being developed to promote the use of AI for the common good of education. During the high-level panel, the latest UNESCO publication, *AI and education: Guidance for policy-makers*, will be launched in the six UN languages.

Session 2 - Ensuring AI as a common good for achieving SDG 4 presents the report of the UNESCO surveys on governmental and non-governmental AI curricula for school education, and reviews how AI literacies and advanced AI competencies are being defined and developed. It shares recommendations on how governmental agencies and partners should collaborate to develop competencies needed by human-AI collaboration, and demonstrates innovative examples on AI competencies development. During the session, a partnership for developing algorithm and data literacy will be announced.

Session 3 - High-level panel on mining data to enhance education management and learning assessment examines the emerging practices of mining data across platforms or multiple data sources to enhance education management, assess lifelong learning outcomes, and diagnose the major problems of learning systems. Specific focus will be given to the use of learning analytics to monitor learning processes and to predict learning failure in order to alert education administrators and policy-makers to dropouts. The session will examine the limitation in using data and AI to support learning assessment and ethical issues relating to the use of data and AI tools to assess and predict human behaviours including data privacy and security, and algorithm biases.

Session 4 - Promoting gender equality and empowering girls and women with AI competencies shares programmes on promoting gender equality to ensure that girls and women have equitable access to AI technologies and AI-enabled learning activities. The session aims to present gender-transformative interventions to empower girls and women with digital skills and AI competencies, and increase their self-efficacy and participation in AI areas. It also facilitates the sharing of knowledge on how to prevent gender discrimination in algorithms and AI tools.

Session 5 - Promoting the use of AI in Africa: Build the partnership focuses on building and promoting partnerships and well-resourced programmes with a vision to build a multi-layer and multi-disciplinary basis needed by African countries and other marginalized groups to maximize the potential of AI innovations. The session aims to strengthen operational partnerships for building AI infrastructure with a special focus on promoting open-source AI algorithms and AI tools as well as the development of AI competencies for key stakeholders. The session will also serve as a follow-up action to other initiatives set out within the framework of UNESCO's Global Priority Africa, in particular the 2018 Benguerir Outcome Statement

adopted at UNESCO's First Forum on Artificial Intelligence in Africa. The latest progress on the organization of regional forums on AI in Africa will be shared.

Session 5 will is followed immediately by the **Closing Session.**

Technical specifications

The event uses Zoom applications to support the live sessions, and uses an online conferencing website to support the registration, the update of live sessions and networking among participants. Live streaming platforms will be used to expand real-time participation.

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International Forum on AI and Education

Ensuring AI as a Common Good to Transform Education

Synthesis Report

The **third International Forum on Artificial Intelligence and Education**, held in 2021, explored the theme 'Ensuring AI as a Common Good to Transform Education'. This publication is a synthesis of the key discussions, focusing on the role in AI and education of digital humanism, and on how AI governance and AI innovation networks can be enhanced to direct AI to the common good for education and humanity.

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@UNESCO @UNESCOICTs

@ICTs in Education

UNESCO
7, Place Fontenoy
75007 Paris
France

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