Draft

BEIJING CONSENSUS ON ARTIFICIAL INTELLIGENCE AND EDUCATION

Outcome Document of the International Conference on Artificial Intelligence and Education 'Planning Education in the AI Era: Lead the Leap'

Beijing, People's Republic of China 16-18 May 2019

Preamble

1. We, the participants of the *International Conference on Artificial Intelligence (AI) and Education*, including 50 government ministers, over 500 international representatives from more than 100 Member States, and some 100 representatives from United Nations agencies, academic institutions, civil society and the private sector, met in Beijing, People's Republic of China, from 16 to 18 May 2019. We express our sincere gratitude to the Government of the People's Republic of China, the Beijing Municipal Government, the Ministry of Education and the National Commission of the People's Republic of China for UNESCO for co-organizing and hosting the conference, and for their warm welcome and generous hospitality.

2. We reaffirmed the commitment made in the 2030 Agenda for Sustainable Development, particularly Sustainable Development Goal (SDG) 4 and its targets, and discussed the challenges faced by education and training systems in achieving SDG 4. We are committed to leading appropriate policy responses aimed at the systematic integration of AI and education to innovate in education, teaching and learning, and at leveraging AI to accelerate the delivery of open and flexible education systems that enable equitable, relevant and quality lifelong learning opportunities for all that will contribute to achieving the SDGs.

3. Recalling the Qingdao Declaration adopted in 2015 on leveraging ICT to achieve SDG 4, which stated that emerging technologies must be harnessed to strengthen education systems, access to education for all, quality and effective learning, and equitable and more efficient service provision, we are cognizant of the urgency of reaffirming and renewing this commitment as we move towards an era characterized by the widespread application of AI.

4. We reviewed the recent trends in the evolution of AI and its profound impact on human societies, economies and the labour market, as well as on education and lifelong learning systems. We examined the implications of AI for the future of work and skills development,

and considered its potential for reshaping the core foundations of education, teaching and learning.

5. We recognize the complexity and rapid development of the AI field, with its multiple understandings, broad range and varied definitions, as well as the diversity of its applications in different contexts and the ethical challenges it raises.

6. We also recognize the distinctive features of human intelligence. We recall the principles set forth in the Universal Declaration of Human Rights. We reaffirm UNESCO's humanistic approach towards the use of AI with a view to protecting human rights and preparing all people with the appropriate values and skills needed for effective human-machine collaboration in life, learning and work, and for sustainable development.

7. We also affirm that the development of AI should be human-controlled and centred on people; that the deployment of AI should be in the service of people to enhance human capacities; that AI should be designed in an ethical, non-discriminatory, equitable, transparent and auditable manner; and that the impact of AI on people and society should be monitored and evaluated throughout the value chains.

We RECOMMEND that governments and other stakeholders in UNESCO's Member States, in accordance with their legislation, public policies and practices, consider implementing the following actions in response to the education-related opportunities and challenges presented by AI:

Planning AI in Education Policies

8. Be mindful of the multidisciplinary nature of AI and its impacts; align AI in education with public policies, particularly education policy; adopt whole-government, inter-sectoral and multi-stakeholder approaches to the planning and governance of AI in education; and set strategic priorities based on local challenges in achieving SDG 4 and its targets as well as the other SDGs. Plan and develop coherent system-wide strategies for AI in education that are aligned and integrated with education policies, within a lifelong learning perspective.

9. Be mindful of the investment requirements for implementing AI in education policies and programmes. Consider the trade-offs between different education policy priorities and identify different sources of funding, including national (public and private), international and innovative funding mechanisms. Consider also the potential of AI to combine and analyze multiple data sources to improve the efficiency of decision-making.

AI for Education Management and Delivery

10. Be cognizant of the breakthrough in the use of data in transforming evidence-based policy planning processes. Consider integrating or developing AI technologies and tools that are relevant for upgrading education management information systems (EMIS) in order to

enhance data collection and processing, making education management and provision more equitable, inclusive, open and personalized.

11. Consider also introducing new models for delivering education and training in different learning institutions and settings that can be enabled by the use of AI, to serve different actors such as students, teaching staff, parents and communities.

AI to Empower Teaching and Teachers

12. Be mindful that while AI provides opportunities to support teachers in their educational and pedagogical responsibilities, human interaction and collaboration between teachers and learners must remain at the core of education. Be aware that teachers cannot be displaced by machines, and ensure that their rights and working conditions are protected.

13. Dynamically review and define teachers' roles and required competencies in the context of teacher policies, strengthen teacher training institutions, and develop appropriate capacity building programmes to prepare teachers to work effectively in AI-rich education settings.

AI for Learning and Learning Assessment

14. Be cognizant of trends regarding the potential of AI to support learning and learning assessments, and review and adjust curricula to promote the in-depth integration of AI content and skills, taking into consideration the ethical aspects and interrelated humanistic disciplines. Consider the application of available AI tools or develop innovative AI solutions, where the benefits of AI use clearly outweigh the risks, to facilitate well-defined learning tasks in different subject areas, and support the development of AI tools for interdisciplinary skills and competencies.

15. Support school-wide pilot tests on the use of AI to facilitate innovation in teaching and learning, drawing lessons from successful cases and scaling up evidence-based practices.

16. Apply or develop AI tools to support adaptive learning processes and to leverage the potential of data to enable the evaluation of the multiple dimensions of students' competencies, and support large-scale and remote assessment.

Development of Values and Skills for Life and Work in the AI Era

17. Be mindful of the systemic and long-term transformation of the labour market, including its gender dynamics, due to AI adoption. Update and develop mechanisms and tools to anticipate and identify current and future skills needs in relation to AI development, in order to ensure the relevance of curricula to changing economies, labour markets and societies. Integrate AI-related skills into the curricula and qualifications of technical and vocational education and training (TVET) and higher education.

18. Be cognizant of the emergence of a set of AI literacy skills required for effective human-machine collaboration, without losing sight of the need for foundational skills such as literacy and numeracy. Take institutional actions to enhance AI literacy across all layers of society.

19. Set up mid- or long-term plans and take urgent actions to support higher education and research institutions in developing or enhancing courses and research programmes to develop local AI talent, and create a massive pool of local AI professionals who have the expertise to design, programme and develop AI systems.

AI for Offering Lifelong Learning Opportunities for All

20. Reaffirm that the guiding principle for achieving SDG 4 is lifelong learning, which encompasses formal, non-formal and informal learning. Adopt AI platforms and data-based learning analytics as key technologies in building integrated lifelong learning systems to enable personalized learning anytime, anywhere and potentially for anyone, with respect for learners' agency. Exploit the potential of AI to enable flexible learning pathways and the accumulation, recognition, certification and transfer of individual learning outcomes.

21. Be mindful of the need to give appropriate policy attention to the needs of older people, especially older women, and to engage them in developing the values and skills needed for living with AI in order to break the barriers to digital life. Plan and implement well-funded programmes to equip older workers with the skills and choices that enable them to remain economically active for as long as they choose, and to engage in their societies.

Promoting Equitable and Inclusive Use of AI in Education

22. Reaffirm that ensuring inclusion and equity in and through education, and offering lifelong learning opportunities to all, are the cornerstones of achieving SDG 4-Education 2030. Reaffirm that technological breakthrough in the field of AI in education is an opportunity to improve access to education for the most vulnerable groups.

23. Ensure that AI promotes high-quality education and learning opportunities for all, irrespective of gender, disability, social or economic status, ethnic or cultural background, or geographic location. The development and use of AI in education should not deepen the digital divide, and must not display bias against any minority or vulnerable groups.

24. Ensure that AI tools in teaching and learning enable the effective inclusion of students with learning impairments, disabilities and/or studying in a language other than their mother tongue.

Gender-Equitable AI and AI for Gender Equality

25. Underline that the gender gap in digital skills contributes to the low share of women among AI professionals, and exacerbates existing gender inequalities.

26. Affirm our commitment to developing AI applications in education that are free from gender bias, and to ensuring that the data used for AI development are gender-sensitive. AI applications should drive the promotion of gender equality.

27. Promote gender equality in the development of AI tools, and empower girls and women with AI skills, to promote gender equality among AI workforces and employers.

Ensuring Ethical, Transparent and Auditable Use of Education Data and Algorithms

28. Be cognizant that AI applications can impose different kinds of bias that are inherent in the data the technology is trained on and uses as input, as well as in the way that the processes and algorithms are constructed and used. Be cognizant of the dilemmas of balancing between open access to data and data privacy protection. Be mindful of the legal issues and ethical risks relating to data ownership, data privacy and data availability for public goods. Be mindful of the importance of adopting principles of ethics-, privacy- and security-by-design.

29. Test and adopt emerging AI technologies and tools for ensuring teachers' and learners' data privacy protection and data security. Support robust and long-term study of deeper issues of ethics in AI, ensuring AI is used for good and preventing its harmful applications. Develop comprehensive data protection laws and regulatory frameworks to guarantee the ethical, non-discriminatory, equitable, transparent and auditable use and reuse of learners' data.

30. Adjust existing regulatory frameworks or adopt new ones to ensure responsible development and use of AI tools for education and learning. Facilitate open debates on issues related to AI ethics, data privacy and security, and on concerns about AI's negative impact on human rights and gender equality.

Monitoring, Evaluation and Research

31. Be mindful of the lack of systematic studies on the impacts of AI applications in education. Support research, innovation and analysis on the effects of AI on learning practices and learning outcomes, and on the emergence and validation of new forms of learning. Take an interdisciplinary approach to research on AI in education. Encourage cross-national comparative research and collaboration.

32. Consider the development of monitoring and evaluation mechanisms to measure the impact of AI on education, teaching and learning, in order to provide a valid and robust evidence-based foundation for policy-making.

We RECOMMEND that international organizations and partners active in the field consider implementing the following actions:

Financing, Partnership and International Cooperation

33. Monitor and assess the impact of the AI divide and AI development disparities across countries, and be mindful of the risks of polarization between those who have access to AI and those who do not. Reiterate the importance of addressing these concerns, giving special priority to Africa, least developed countries (LDCs), small island developing states (SIDS), and countries affected by conflict and disaster.

34. Coordinate collective actions to promote the equitable use of AI in education in the context of the global and regional Education 2030 architecture, including through sharing AI technology, programmes and resources for capacity-building, with due respect for human rights and gender equality.

35. Support forward-looking reviews of frontier issues related to the implications of emerging AI development, and facilitate the exploration of effective strategies and practices for using AI to innovate in education, with a view to building an international community with common views on AI and education.

36. Align international cooperation with national needs for the development and use of AI in education and for cross-sectoral cooperation, to enhance ownership of the development of AI technology among AI professionals. Strengthen information sharing and the sharing of promising practices, as well as coordination and complementary actions among countries.

37. Provide adequate platforms for the international exchange of regulatory frameworks, instruments and approaches to AI in education, including through UNESCO's Mobile Learning Week and through other United Nations agencies, and thereby support and benefit from South-South and North-South-South cooperation on leveraging AI for SDG 4.

38. Create multi-stakeholder partnerships and mobilize resources to reduce the AI divide and increase investment in the application of AI in education.

We INVITE the Director-General of UNESCO to seek to implement the following actions:

39. Establish an 'AI for Education' platform to act as a clearinghouse for open-source AI courses, AI tools, examples of AI in education policies, regulatory frameworks and best practices on AI in education, with a view towards promoting the use of AI for SDG 4, supporting debate on the future of education and learning, and making open-source AI resources and courses accessible to all.

40. Develop guidelines and resources in consultation with Member States to support the development of policies and strategies for the effective and equitable use of AI in education. Support the capacity building of education policy-makers.

41. Reinforce the leading role of UNESCO in AI in education across concerned sectors, divisions or departments, and mobilize the Organization's institutes and networks.

42. Support the integration of AI skills into ICT competency frameworks for teachers, and support countries in training teaching staff on working in AI-rich education settings.

43. Further expand UNESCO's cooperation in the field of AI in education with relevant United Nations and multilateral partners, as well as with regional development banks and organizations and with the private sector.

44. Undertake appropriate regional and international follow-up actions to the Conference, acting in cooperation with development partners active in this field, to build on and extend the outreach of the Consensus.