

United Nations Educational, Scientific and Cultural Organization

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https://en.unesco.org/themes/ict-education

Al and the Futures of Learning

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Outline

- UNESCO Work on AI and Education
- AI and the Futures of Learning



"UNESCO Portfolio" to support ICT in education policies and programmes







Support sector-wide ICT in education policies & masterplans

ICT in Education Policy Toolkit : <u>https://en.unesco.org/icted</u>



OER as a cross-cutting policy area

- **1.** Intellectual guidelines:
- <u>Guidelines on the Development of OER Policies</u> (EN, FR, SP)
- 15 case studies: <u>OER: Policy, costs, and</u> <u>transformation</u>
- 2. Instruments:
- Paris OER Declaration (2012)
- OER Recommendations (2019)
- 3. Capacity development:
- Supported 20+ countries in developing national OER policies



Al and Education as a cross-cutting policy area

- Beijing consensus on AI and Education (6 UN languages)
- Al and education: Guidance for policy-makers (EN, CN)
- Report on Developing AI Competencies (2021)
- >80 Best practices on AI in education: <u>Compendium</u> (2020); Compendium (2019)



UNESCO work on Artificial Intelligence and Education



AI and Futures of Learning

- 1. Need-driven AI-enabled futures of learning -What sort of AI to enable what sort of learning?
- 2. Ethical principles on AI in education -Toward digital humanism?
- 3. Al competencies development for schools
 - -AI literacy for individuals? AI skills to catch up with Industry 4.0?



1. What sort of AI to enable what sort of learning?



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- Current AI algorithms are focused on replacing factual knowledge based tutorial tasks or other low-skill tasks.
- The design of AI for education should be oriented toward fundamental challenges of education systems.
- Revolution of AI in education won't happen until it motivates student agency and enables knowledge creation.



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Making AI a common good for the futures of learning

- **1. Inclusive access**
- Huawei StorySign
- 2. To diagnose and treat Autism
- Naturalistic Observation Diagnostic Assessment -
- <u>AIDA</u> help autistic children and closest people to communicate effectively
- **3.** To support learners with dyslexia or reading difficulties
- <u>Change Dyslexia</u> (Laureate of the 2019 edition of UNESCO Prize for ICT in Education)
- 4. To treat writing difficulties
- Writing robot: Allows learners to teach a robot to write based on their own writing difficulties



5. Content profiling

M-Shule – "mobile school" in Swahili of Kenya: first personalized knowledge-building platform in Africa to connect learners to tailored learning, evaluation, activation, and data tools over SMS. <u>https://m-shule.com/</u>



6. Low-skill education management

Natural language processing and machine learning based Educational Chatbots:

 "One College Student per Village" (Laureate of the 2020 edition of UNESCO Prize for ICT in Education) of the Open University of China uses Chatbots to help villagers.



7. Data-informed psychometric profiling

Adaptive Learning Platform (ALP) - analyses users; data, aggregating it to create psychometric profiles of each individual student's interactions, preferences, and achievements - it should not be used to pre-determine student's futures: https://www.kidaptive.com/



8. Monitoring learning outcomes and drop-out

 VILLE - an adaptive digital learning platform developed by University of Turku, Finland (Laureate of the 2020 edition of UNESCO Prize for ICT in Education): <u>https://www.learninganalytics.fi/en/ville</u>



1. What sort of AI to enable what sort of futures of learning?



AI Enabled Futures of Learning: Towards digital humanism

- Digitalization is not only about digital transmission of 'traditional' knowledge.
- It is more about the digitalization of knowledge production as well as the production and sharing of digitalized knowledge.
- It will be about the digitalization of human societies, digital human 'being', and digital humanism, which will guide our education.



Surveys on the use of AI in COVID-19 education response

Regulation on data privacy is left behind the deployment of AI in education.

- Data is a new property
 → reform laws for new property protection
- Data ownership: Where are data from? Who own it? How to use?
- AI system cycle: Developers → managers → users of AI
- Total cost of ownership: Tech inventory + incremental Tech



- Deployment: Cloud,
 on premise, offline
 Apps → "data
 sovereignty"; Users'
 human rights and
 human dignity
- Requirement for additional 'labors'?
- Human agency

2. Ethical principles for regulating the use of AI in education systems

- Protect data privacy
- Prevent algorithm discrimination
- Regulate intrusive AI-powered tools
- Promote human agency
- Reveal uncharted ethical issues ...



3. Al competencies development for school students

- Al literacy for individuals: What are the values, knowledge, and skills needed by all to live and work with AI?
- Al skills to catch up with Industry 4.0: What human resources are needed by countries to catch up with Industry 4.0?



Surveys on governmental and non-governmental Al curricula

- >50 curricula from 23 countries: Governmental agencies, academia, private sector, the third Sector
- Most of them integrated in the ICT curriculum

Country	What is the title of the AI curriculum?
Austria	Data Science and Artificial Intelligence
	Digital Basic Education (the federal ministry is working on this one, to train young people/students with basic skills and social implications)
	Higher Colleges of Business Administration for Digital Business (This is also one type of school, for digital etc - wanted AI to be competitive)
Bulgaria	computer modeling, information technology, informatics
China	Information Science and Technology
India	ATL AI base module, ATL AI Stepup Module, Workbook
Portugal	Information and Communication Technologies
Qatar	Computing & Information Technology (High Tech Track)
	Computing & Information Technology
Serbia	Modern technologies - 3rd and 4th grade of gymanisum
	Technique and Technology - 7th and 8th grade
	AI in all high schools - 3rd grade
	AI in gymnasiums
	Informatics and programing - 8th grade

Average Curriculum Profile on main learning objectives



Key Findings:

- The total hours range from less than **2 hours to 924 hours**. Time per grade can be up to 226 hours.
- Curricula across all developers focus the most on 'AI basics' such as data literacy and programming, followed by understanding and using AI. The least emphasis is on developing AI.

Suggested Learning Environments

Hardware and Software:

Computers, tablets, laptops, internet/web access, robot labs, Raspberry Pi, Herramientas multimedia, virtual

communication for a...

Programming Environments:

Alice, Eclipse, Kodu, PyCharm, Jupyter Notebook/Lab, MIT App Inventor, Microsoft MakeCode for MineCraft, Microsoft Visual Studio Code, Netbeans, Pandas, Scikit-learn, Sketch2Code...

AI Techniques and technologies:

Keras, TensorFlow, MachineLearning4Kids, Teachable Machine, Robotics, simulation, Alexa, Google Assistant, GAN, emotiondetection software, artificial grading software... Other Platforms and Resources: YouTube, publically-available datasets

AI Competencies: Values, knowledge, and skills



Understands citizens rights with respect to AI

Reflects on short- and long-term positive and negative results of AI

Can engage critically in social conversations about applications of AI

Can evaluate AI for bias, fairness, etc.

Creates meaningful AI products that provide social benefit



Knows what AI is and does

Understands the processes and steps taken by different types of AI (decision trees, neural networks)

Understands the social implications of AI

Understands the role of data and types/locations of data collection



Can recognise what is and is not AI

Knows and applies data processing techniques

Is empowered to pursue learning outside the classroom

Uses AI technologies to develop new or revise existing products/ideas

Applies design thinking and development processes to AI products

Preparing teachers to work in Al-rich education settings

AI literacy (Data & Algorithm Literacy)



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Thank you!

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