A new RenAIssance for the future of Education

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The “good” algorithm? Artificial Intelligence, Ethics, Law, Health

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AI winter

When

The ‘80s

Technological context

Experiments conducted in various research centers fail to fully meet the high expectations of impact on the market and on society

Example

"Toy examples" promising but not yet capable of responding to the typical complexity of real applications
AI spring

When
The ‘90s

Technological context
A significant increase in the reliability of the algorithms allows AI to go beyond the perimeter of the academy, reaching the most advanced industrial contexts

Example
NASA Deep Space 1 (first system to control a spacecraft without human supervision)
AI summer

When
After 2000

Technological context
AI becomes extremely pervasive, taking root in a lot of sectors and enabling profitable business models

Example
GAFA (Google, Amazon, Facebook, Apple)
AI summer: AI in everyday life

- Market intelligence: Dynamic pricing, Automated trading system, Market forecasts
- Operational optimization: Route planning, Stock management, Predictive maintenance
- Conversational agents: Chatbots, Voice user interfaces, Virtual assistants
- Advanced customization: Content recommendation, Precision medicine, Personalized advertising
- Autonomous systems: Industrial robots, Driverless vehicles, Self-flying drones
- Anomaly detection: Banking fraud detection, Insurance fraud detection, Proactive functional medicine

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AI summer: an additional economic output

The economic impact of AI: the potential to double annual economic growth rates (%)

14%
Potential global GDP growth by 2030

Source: Accenture and Frontier Economics

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AI summer: an additional economic output (cont’d)

$15.7tr
Potential contribution to the global economy by 2030 from AI

Source: PwC
The world we want: a future for all

The United Nations in 2015 set 17 goals to promote long-term human well-being. They are universally valid, meaning that all countries must contribute to achieve these goals.

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Education as driver of social mobility

Towards 2030

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
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How to rethink education in view of the increasing presence of AI: three perspectives

Education to AI

AI for education

Education for AI
AI for Education: challenges

**Good education: the best investment a society can make for its future**

AI is playing an increasingly important role in building the future of teaching and learning.

Main challenges:

- No child left behind: high disparities in educational opportunities by region, gender and socioeconomic background
- New educational models (from the one-to-many to many-to-many) and new market spaces for private actors
- Large amounts of data collected from students to manage

*More than half a billion children worldwide do not have basic skills* (source: United Nations)

![A global learning crisis](source: United Nations)
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**Innovative teaching methods to leverage new technologies**

For students:
- Remove linguistic and logistic barriers, issues and inequalities
- Tailor and personalize learning, based on abilities, needs and experience (e.g.: AI-powered chatbots, smart notes, flashcards, virtual facilitators, autonomous assistants)

For teachers:
- Enhance new learning outcomes, improving quality provided
- Manage back office and administrative activities, offering more time to focus on educating students and research
Education for AI: challenges

**Disruption in labor market: be prepared to manage the change**

- A new human-machine interaction: automation will reach 50 percent of work activities
- AI as job category killer (e.g.: transportation, retail, professional employment services, customer service)
- Increasing mismatch between skills and jobs: a development of competencies is needed, less routine skills will become more important

The number of graduates in STEM is around 4 percent in EU, but demand for STEM jobs is expected to grow by around 8 percent by 2025 (source: European Commission)

![New skills for the future of work](chart.png)
Education for AI: opportunities

How to reinforce our educational system by developing new competencies

- Increase technological understanding (schools and universities)
- Support workforces in reskilling and upskilling (business community)
- Lifelong learning (all people)
- Create good environment to invest in people’s capabilities (governments)
Education to AI: challenges

AI must be used for the good of our societies and the sustainable development

AI brings new challenges in terms of governance related to its interaction with human cognitive capacities and automatic decisions making:

- information asymmetry (only developers understand how algorithms are constructed and work)
- lack of a legal and regulatory framework (trade-off dilemma between data ownership, open access to data, and data privacy protection)
- mismatch ‘good for people’ vs. ‘good for governments’

Every day the world creates 2.5 quintillion bytes of data (source: World Economic Forum)
Education to AI: opportunities

**Ethical AI: the leading role of EU**

EU should exercise its leadership to promote a ‘human-centric’ approach to AI.

Seven key requirements defined in 2019 by the European Commission for achieving trustworthy AI:

- human agency and oversight
- technical robustness and safety
- privacy and data governance
- transparency
- diversity, non-discrimination and fairness
- societal and environmental well-being
- accountability
Disruption is the new normal
A future-proof education in the age of algorithms

- 65% of children entering primary school today will ultimately end up working in completely new job types that do not yet exist (source: World Economic Forum)

- Due to accelerating technological changes, workers will have to modify 50-60% of their business-as-usual in the next 5 years (source: EY)

- Over 20 new job categories will be created in the next 10 years (source: Cognizant)
Education is simply the soul of a society as it passes from one generation to another

- Teach students how to learn
- A lifelong learning model: people will go back to school several times in their life
- Creativity and soft skills as the linchpin of the next-generation learning process
- Produce multi-disciplinary professionals, with robust STEM competencies and non-technical competencies

Let’s build the future together!

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