



AI for Education







Towards enhanced learning outcomes, equity, and inclusion

Perform AI

Towards enhanced learning outcomes, equity, and inclusion

Education is an important sector that can benefit tremendously from Artificial Intelligence (AI). The transition to online learning due to COVID-19 has exposed significant gaps in school systems and has proven the necessity for technology assisted learning. Adapting AI technologies will help developing nations to bridge the gap with their more developed counterparts with relative ease.

AI has helped in the following:

-  Supporting students with disabilities and health impairments – through robotics and virtual reality.
-  Identifying students at risk of drop out in schools to help them finish their education and reduce dropouts.
-  Tailoring and personalizing training programs, based on the users' knowledge, interests and strengths, to ensure smoother learning curves.
-  Foreign language learning through speech recognition and analysis, pronunciation correction and error remediation, reducing the error rate by an average of 83%.
-  Creating automatic curriculums for teachers through augmented intelligence assistance, geared to the students' specific needs.
-  Generating textbooks customized for a specific school, course or even group of students.



About SDGs

The Sustainable Development Goals (SDGs) are at the heart of the 2030 Agenda for Sustainable Development adopted by all United Nations Member States in 2015. They consist of 17 interlinked global goals that must go hand in hand with strategies in order to create a better and more sustainable future. SDG 16 addresses the main objectives that are linked to AI and justice.

[You can learn more about the SDGs here.](#)

100%

of the scope of SDG 4
"Quality Education" will be
positively impacted by AI



National AI Strategies

Numerous governments worldwide have already implemented the purposes in their national AI strategies on education and are strongly driving the development and application of AI in the field of education, as they realized the importance of the technology.

The Netherlands – Fostering research and innovation in AI through online courses and training

The Dutch government's policies, embedded in the policy report "Strategic action for artificial intelligence", support education and skills development in AI: Civil servants have access to the national online course on AI. Training and lifelong learning are promoted with the STAP-scheme to offer AI training opportunities and digital skills for citizens.¹

Sweden – Increasing the stock of AI talents through bachelor's and master's degree programs

The Swedish government's AI strategy "National Approach for Artificial Intelligence", encourages skills development through training and education instruments: Swedish universities offer bachelor's and master's degree programs in AI fields, for example on Data engineering, Machine learning and statistics, Image analysis and machine learning at Uppsala University.²



China – Investments and AI park in cooperation with start-ups and universities to support research

China's Ministry of Industry and Information Technology presented a national strategy for AI under the title "A Next Generation Artificial Intelligence".³ The city of Beijing proclaimed (January 2018) the construction of an AI park to support research and commercialization through startups in partnership with foreign universities.⁴ The city of Tianjin announced plans for a fund for investments in the AI industry and higher education.^{5,6}

Mexico – Capacity building, skills and education

Mexico's AI Strategy 2018 encourages the introduction of coding, tech skills, science, math and engineering early in the national curriculum.

The goal is to increase the number of students at master and doctoral levels in AI and data science, support, ensuring the workforce can adapt to changing conditions. For instance, better services for citizens such as the implementation of virtual assistants are addressed.⁷



“The solution should be to enhance the use of AI in education in order to reach a larger portion of the population, and accelerate education for all.”

- Dalia Bahous
Managing Consultant
– Capgemini Invent

99.4%

of 509 higher education institutions in the US say AI will be instrumental to their institution’s competitiveness in the next three years.

54%

have started to experiment with AI.

15%

called AI a “game-changer”.⁸

Our Approach

When addressing AI and data analytics for education, the four PublicGoesAI playgrounds of Capgemini’s vision of AI in the Public Sector along the following use cases display how **#AI4Education** can transform education and skills development and help both students and teachers.



Intelligent automation of teaching materials and processes

Creation of **automatic curriculums** through augmented intelligence assistance, geared to the students’ specific needs.



AI-based interaction with students and teachers

Support of students with **disabilities and health impairments** through robotics and virtual reality.



Detection of drop out risks and errors

Identification of students at **risk of drop out** in schools to help them finish their education and reduce dropouts.

Foreign language learning through speech recognition and analysis, pronunciation correction and **error remediation**, reducing the error rate by an average of 83%.



Augmenting decision making with AI

Tailoring and **personalizing training programs**, based on the users’ knowledge, interests and strengths, to ensure smoother learning curves.

Generation of textbooks customized for a specific school, course or even group of students.

Capgemini supports governments and educational institutions, such as ministries and schools, to rethink and rework educational programmes and helps to impart cutting edge IT skills to young people. Working with students as part of the **Capgemini Schools Programme**, the firm tries to play a role in fostering talent and giving young people the skills, they need in order to become valued members of society.⁹ Over the last academic year Capgemini professionals have worked with **6,900 students** including over **3,500 female students** on

- 1. IT skills and careers** – showcasing opportunities in digital media, testing and architecture;
- 2. Business awareness** – basic commercial awareness, project management, and the breadth and variety of roles in large corporate organisations;
- 3. Communication and teamwork** – generating ideas, effective teamwork, and communicating differently;
- 4. Employability skills** – from mock interviewing and CV writing to basic numeracy.

“AI can be used to deliver high quality, effective, personalized education.”

- Iulian Vlad Serban
CEO – Korbit Technologies



47%

It is expected that by 2024 upwards of 47% of learning management tools will be enabled by AI capabilities.¹⁰



Supporting students to finish their education with the help of AI



Optimizing mathematics and PISA scores with AI

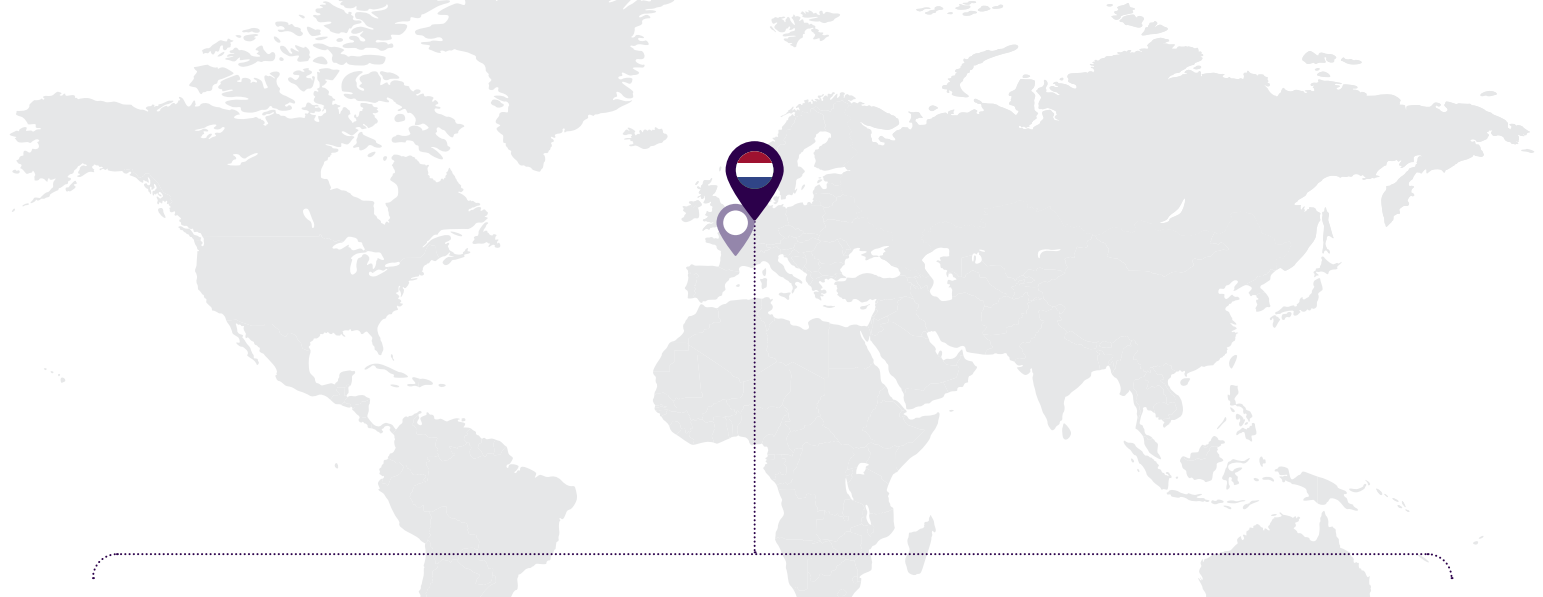


Use Cases

Perform AI

Activate data.
Augment intelligence.
Amplify outcomes.

Use Case – SUPPORTING STUDENTS TO FINISH THEIR EDUCATION WITH THE HELP OF AI



Capgemini Netherlands developed a predictive model that, using machine learning, helps identify students who have a high chance of dropping out, thereby enabling early intervention of teachers and support for students to finish their education.

Challenges

- Student dropout rates have been increasing across the world. With regard to Europe, a main concern is that on average 10% of the students drop out before obtaining a higher academic degree.
- Incomplete higher education can hamper the Europe 2020 strategy's goal of 'having at least 40% of 30-34-year olds complete higher education, thus increasing the overall education level'¹².
- Reducing dropout and improving completion rates in higher education is one of the key policies for achieving this target.

Solutions

- In order to support schools, Capgemini developed a predictive model that, by exploiting machine learning techniques, allows early on identification of students that might drop out.
- Considering approximately 33,000 sample observations and approximately 1,800 dropout observations, and taking into account the class imbalance, the prediction accuracy was 91% for observations that the model has not been trained on.
- Thus, the AI-based prediction tool allows for early interventions and helps teachers to give affected students more attention to ensure that they do not compromise their education.



Use Case - OPTIMIZING MATHEMATICS AND PISA SCORES WITH THE HELP OF AI



Capgemini enabled adaptive learning solutions based on the evaluation of the impact of learning methods

Challenges

- 500 classes of 9th graders take an online math exam every year to participate in the PISA study.
- Decreasing results and low scores of students over the last few years in the domains mathematics and reading, slightly above the OECD average, was concerning.
- Although students mostly used the same method consistently, there was very little correlation between success and failure of different exercises. This performance was impacting the future of students to pursue higher education.

Solutions

- The mathematics application within the framework of the PISA study generates millions of logs that were not analyzed until 2016.
- Data science algorithms were used to observe the impact of teaching methods by analyzing the results and logs on the same exercise over several years.
- This enabled us to reveal learning paths and evaluate the impact of learning methods. Results show that the application design is an important source of failure.



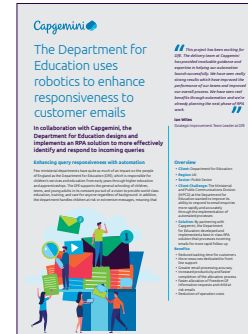
Thought Leadership Positions



Sector Analysis:
Higher Education
2018



Cappgemini
Schools Programme



Department for
Education

Contact our Experts!

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More Information

Missed the event?
Catch up on all the
individual session
recordings!



Additional links
[Our Perform AI Offer](#)
[AI in the Public Sector](#)
[Cappgemini @ AI for Good Summit](#)

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More information





About Capgemini

Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided everyday by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of 270,000 team members in nearly 50 countries. With its strong 50 year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fuelled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering and platforms. The Group reported in 2020 global revenues of €16 billion.

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