

RESET EDU

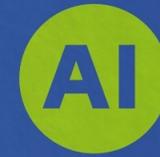
Resetting education
for the digital age
Ljubljana, 8 - 9 November 2021

AI & Education, where are the achievements in 2021 ?

Axel Jean

Head of Department for the Support of Digital Innovation and Applied Research
Directorate for digital technology for Education

Ministry of National Education, youth and sports - France



Artificial intelligence in education and for education in France

MINISTÈRE
DE L'ÉDUCATION
NATIONALE,
DE LA JEUNESSE
ET DES SPORTS
*Liberté
Égalité
Fraternité*

ACTION 6

Artificial intelligence and data usage
in education and training

An initiative of the Digital Education Action Plan

DEAP
EUDigitalEducation

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Artificial Intelligence (AI)

history & legacies - definitions & objectives
... to be co-constructed in education



AI, an ancient history, a « young science » and recent possibilities for Education.

Multiple legacies.

Pedagogical and also societal, ethical, technological, economic issues ...

Numerous definitions since 1956.

AI:

*"All the theories and techniques implemented with a view to making machines capable of *simulating* intelligence."*

French dictionary - Larousse

*Simulate *, resemble (in specific sectors), to assist and aid human intelligence

Beyond the oxymoron of "artificial intelligence":

* Simulating * is not replacing, it is modelling, imitating.



AI FOR
HUMANITY

L'INTELLIGENCE ARTIFICIELLE
AU SERVICE DE L'HUMAIN.



What are the challenges for artificial intelligence in education ?

Education 21025



Artificial intelligence and education



Artificial Intelligence acts as an **accelerator** in a society where digital technology is disrupting the way **people work**, **access knowledge** and **social relationships**.

There are many challenges to be met from the earliest age in terms of **awareness**, **acculturation** and **training** for several generations.

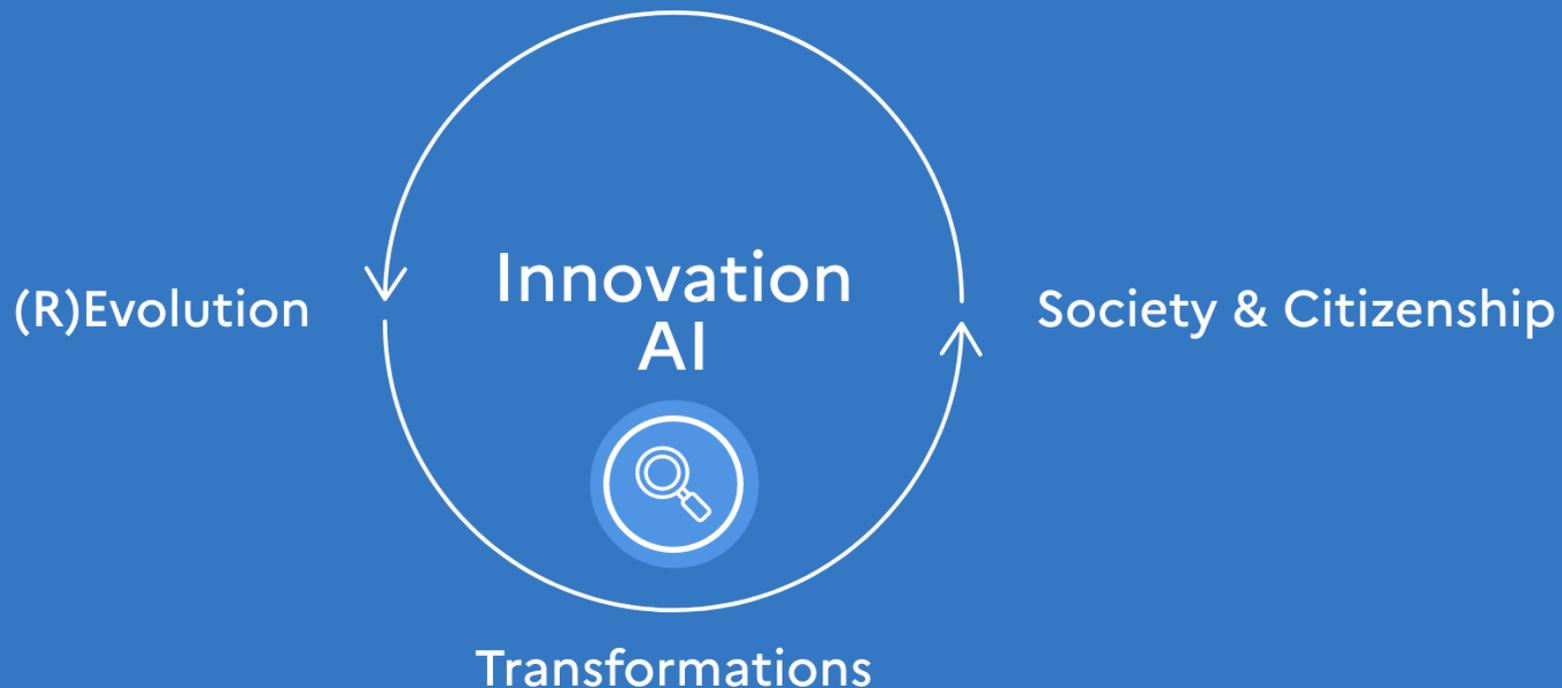


Innovation & Education

AI Innovation Partnership #P2IA

AI FOR
HUMANITY

L'INTELLIGENCE ARTIFICIELLE
AU SERVICE DE L'HUMAIN.



DIRECTION DU NUMÉRIQUE POUR L'ÉDUCATION
2021 @Edu_Num #P2IA

Innovation & Education

AI Innovation Partnership #P2IA



Prepare / Accompany / Frame / Know

Are we here?

(R)Evolution

2 axes for Education

- Developing AI-based services for learning
- Develop information and training on AI

Innovation
AI



Transformations

DIRECTION DU NUMÉRIQUE POUR L'ÉDUCATION
2021 @Edu_Num #P2IA

*High stakes for managers
and trainers.
* Necessary conditions*

Society
& Citizenship

*To prepare and protect.
Critical thinking,
* Sufficient condition*

*If so, training on all levels
is a necessary condition*



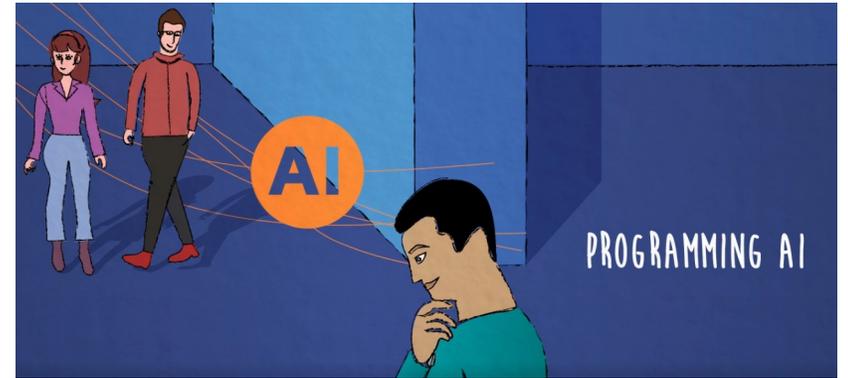
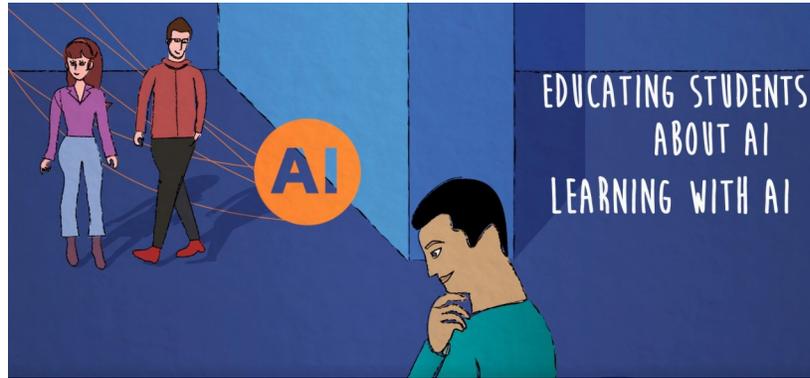
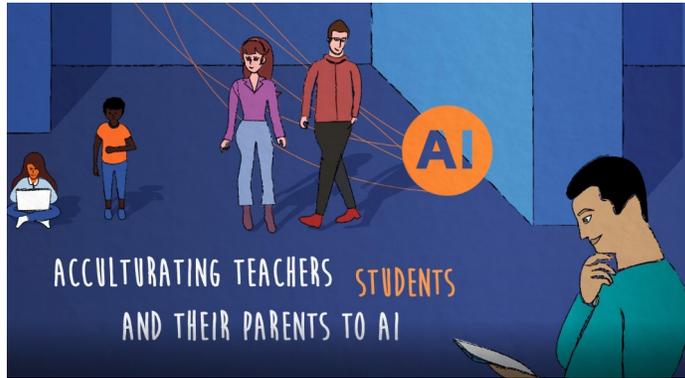
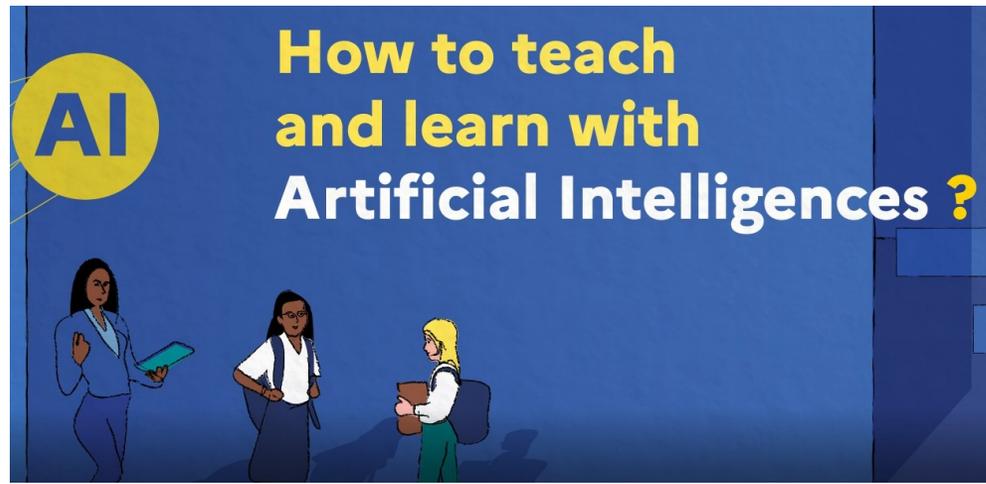
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How to teach and learn with Artificial Intelligences ?





Artificial Intelligence and education Developping AI-based services for teaching and learning - Objectives

PARTENARIAT d'INNOVATION
INTELLIGENCE ARTIFICIELLE
Partenariat d'innovation pour l'acquisition d'un assistant pédagogique basé sur
l'intelligence artificielle à destination des enseignants et des élèves du cycle 2.

AI for education principle selected in **France** for exemple in the AI Innovation Partnership (P2IA)



Objective:

Assist and support teachers in **differentiating** learning through innovative digital services **based on AI**.

Modalities:

→ Mobilise theories and realise digital services based on AI in order to propose solutions capable of ***processing*** data, **assisting** and **interacting** with humans to learn.

Process, analyse, present, exhibit, organise activities that dynamically for the teacher and student.

Scope in the first AI innovation partnership (launched in 2019).

Part of the fundamental learning in **French** (reading and writing) and **mathematics** (numbers and calculations, geometry) in primary school (for 6-8 years old pupils).

→ Future P2IA school - college - high school under construction in 2021/22

Artificial Intelligence and education

PARTENARIAT d'INNOVATION INTELLIGENCE ARTIFICIELLE

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Avec le soutien de



- **Specificities of the Innovation Partnership modality (public procurement)**

Possibility of **qualifying several solutions**: 3 in French and 3 in mathematics

New or significantly improved innovative services

- ✓ **Stimulating innovation in the field of education / Transformation with digital technology**

Artificial Intelligence and education to be co-constructed with teachers, searchers & EdTech actors

Specificities of the Innovation Partnership modality

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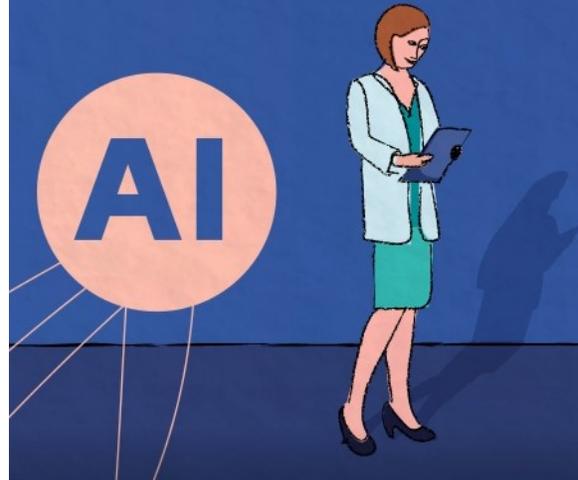


- **3 successive phases** to **develop**, **co-construct** and **deploy** innovative services for schools:
 - Initial 15-month **Research & Development phase** to prototype solutions adapted to school with the help of **volunteer educational teams all over France**
 - **Pre-industrialisation phase** according to the results and feedback from the teachers and trainers
 - **Deployment / exploitation** according to the maturity of the services created for teachers at national level for 4 years.

AI FOR
HUMANITY

L'INTELLIGENCE ARTIFICIELLE
AU SERVICE DE L'HUMAIN.

What are the innovative digital services developed in France for schools ?



Artificial Intelligence and education for an AI we can trust

**Better protect and better value
by accompanying an EdTech sector in the French and European expectations**

The innovation partnership, a modality building confidence in AI for Education

In order to "give a meaning to artificial intelligence", the Ministry requires from the titular teams (EdTech) the implementation of a pedagogical digital service in **a framework of trust** articulated around **3 main structuring axes** and **respectful of democratic issues**:

Ethical & legal (RGPD)

- Thinking about ethics from the design stage (Ethic by design), and actively monitoring it during operation
- Increase transparency, develop the "interpretability" of proposals, "illuminate the black boxes" to empower users
- Improve auditability of AI systems, "open the black boxes" (including RGPD)



Artificial Intelligence and education for an AI we can trust

The innovation partnership, a modality building confidence in AI for Education

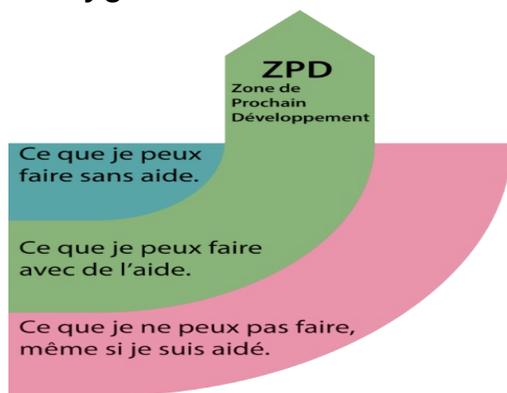
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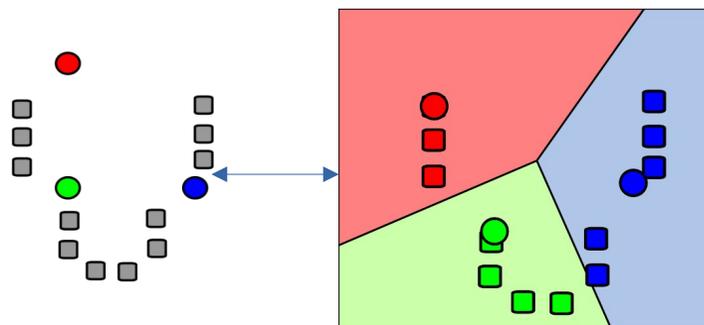


Scientist
With the pedagogical and technological contributions of **scientific research**, propose assistance services based on AI bricks (all kind of AI)

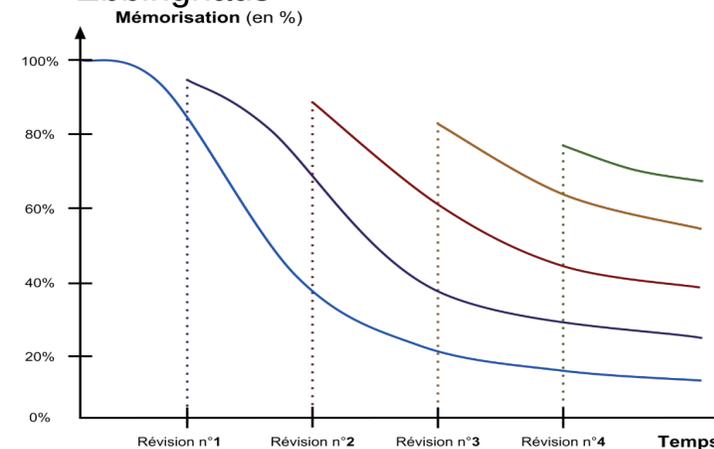
Zone of Next Development (ZPD)
Lev Vygotski



Dynamic clustering
Clustering illustrations K-means



Forgetting and remembering
Ebbinghaus



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Avec le soutien de



User-centred (teachers and students)

- a) From the design of the device and during the initial instruction
- b) Co-construction with iterations via applied research from the laboratory to the classroom, from the classroom to the laboratory
(support and adjustments with teachers, trainers in different areas of France)
- c) Co-construction and regulation with the Ministry's teams

Innovation in the classroom and in the academy, from the laboratory to the classroom, from the classroom to the laboratory

The roles of Digital Academic Education, inspectors responsible for the digital mission department, district teams including teachers referral to digital uses are crucial to allow :

- A **promotion / dissemination** of the R&D phase of P2IA with the participation of teachers and educational teams of school, district, academy,
- An **expert pedagogical support** (information and training) closer to the needs of educational teams on the new possibilities offered by AI for school.
- A shared information between academies and Ministry on the strengths and weaknesses of the solutions in R&D **to decide on the interest of a national generalization of AI solutions.**

An "*AI mix for pedagogy*" at the service of teachers and students

Solutions based on one or more types of AI

For teachers

Work adapted to the needs and pace of each student.

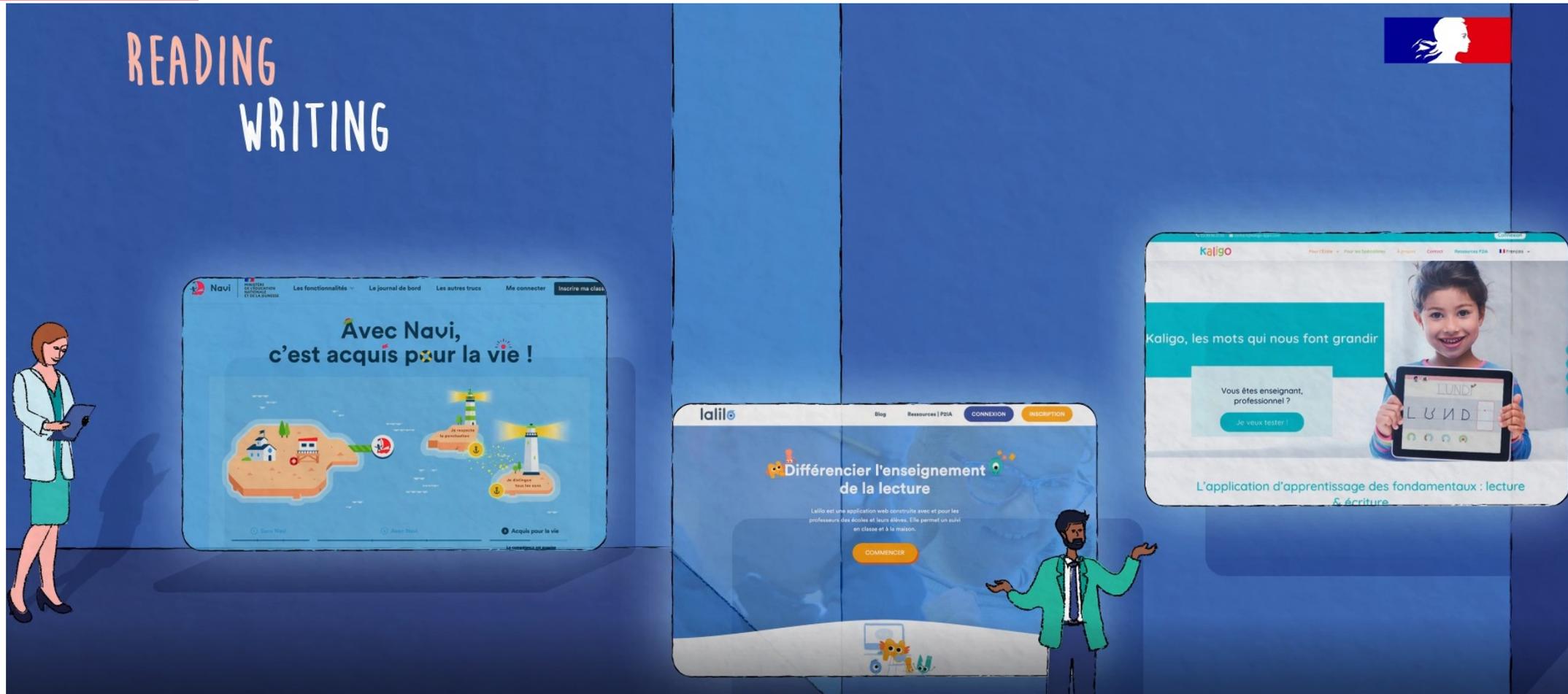
- Helping teachers to identify needs for personalised learning,
- Helping teachers to form dynamic groups of pupils.

An "*AI mix for pedagogy*" at the service of teachers and students

Solutions based on one or more types of AI

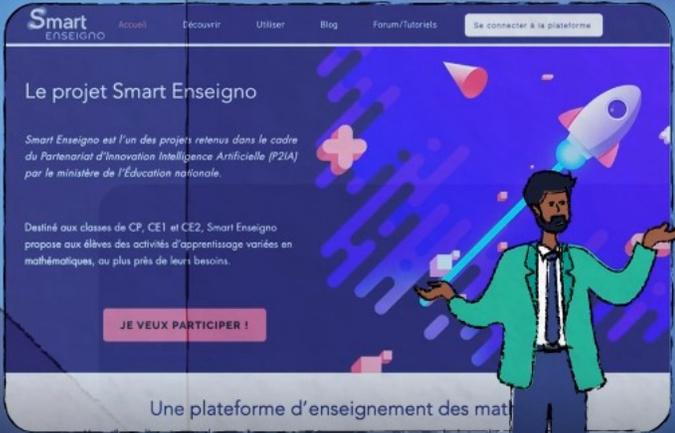
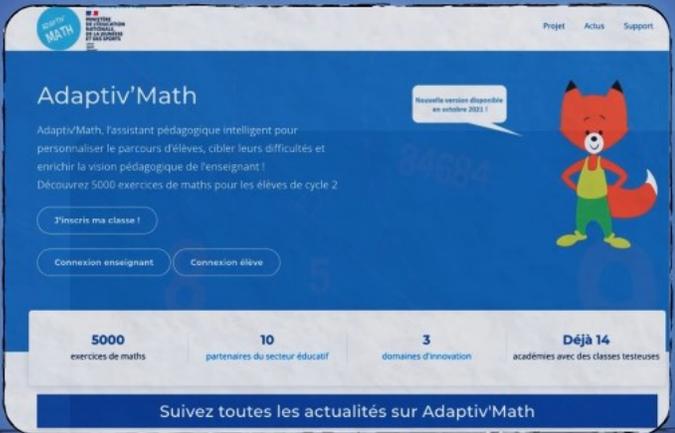
For the student, differentiated follow-up

- **Adaptive Learning** (from expert systems to Deep Learning) / e.g. to provide activities/exercises at the "right level and at the right time" (ZPD and memory work); personalisation of learning
- **Dynamic clustering of students** / for differentiation and collaboration between students
- **Natural language processing** / e.g. reading management/fluency, maths before reading
- **Trace analysis including handwriting** / e.g. from learning to write to spelling activities (dictation), writing numbers in maths (on tablet).



<https://eduscol.education.fr/cid118880/parteneriat-d-innovation-et-intelligence-artificielle-p2ia.html>

CALCULATION PROBLEM SOLVING



<https://eduscol.education.fr/cid118880/parteneriat-d-innovation-et-intelligence-artificielle-p2ia.html>



ORAL ENGLISH



Captain Kelly

Apprendre l'anglais avec Captain Kelly,
l'assistant vocal avec plus de 300 activités interactives



Application Captain Kelly (V1.0)

JE TÉLÉCHARGE L'APPLICATION



Guide du professeur des écoles Captain Kelly

JE TÉLÉCHARGE LE GUIDE DU PROFESSEUR



Flashcards Captain Kelly (Thèmes 1 à 6)

JE TÉLÉCHARGE LES FLASHCARDS

Artificial Intelligence and education

LALILO

The contribution of AI in terms of individualizing teaching is particularly interesting when it comes to training in reading a text.

Lalilo offers an adaptive learning tool for speech recognition that allows each student to practice individually, while in the whole class the teacher can only have one student read at a time.

The algorithm is designed to provide a pedagogy of success, by proposing exercises that the student succeeds most often, allowing him/her to gain self-confidence to enter a virtuous circle of learning.

From the first grade onwards, the speech recognition AI allows the student to be offered help in reading simple words aloud. The recording is done using the voice recognition module and a feedback is given to the student. The exercises will gradually move from reading words to reading sentences and then whole texts.

Whether for training or evaluation, the AI will detect decoding errors, fluidity, speed and reading endurance.

These are all data that will enrich teachers' pedagogical decisions.



Site compagnon Lalilo

<https://p2ia.lalilo.com/>



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Artificial Intelligence and education

NAVI

NAVI proposes to develop a real teacher's assistant based on artificial intelligence, useful to the teacher to help young students progress in learning to read and write.

NAVI is positioned as a content recommendation and remediation engine, adapted to each student and fed by the teacher's feedback.

NAVI aims to provide teachers with an intelligent assistant based on the use of data and AI, as well as on personalised and adaptive learning paths, accessible in class or on the move on all media (web, touch pads, smartphones, paper).

The platform will include a database of printable, multimedia and interactive resources covering the key concepts of the fundamental learning of French programmes, elements for monitoring and differentiating groups of pupils, in particular through dashboards and a system of recommendations to help teachers conduct their classes and enable them to adapt their progress and differentiate it.



Site compagnon Navi

<https://navi.education/>



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Artificial Intelligence and education

KALIGO

Kaligo focuses on strengthening the links between reading and (hand) writing.

In particular, it is intended to enable students to prepare for different types of dictation independently and according to their own needs.

To do this, the AI mobilized is based on three principles:

- Analysis: The AI must be able to identify a student's successes and difficulties;
- Feedback (or "return to the student"): the system must then make the student understand his or her mistakes, for example visually or orally;
- Remediation: the AI must finally be able to adapt the exercise path to help the student progress; this autonomous training promotes memorization.

These principles go hand in hand with a graphical interface and ergonomics that can capture the students' attention and make them want to train and learn while avoiding unnecessary cognitive overload.

Kaligo uses a voice analysis AI ("reading analysis"), to determine the adequacy of a student's words with pronunciation - based on pronunciation and fluency - and a handwritten form analysis AI ("writing analysis") to determine the adequacy of a student's plots with a teacher's model - based on form, ductus, speed, fluidity, proportion and positioning in relation to context.



Site compagnon Kaligo

<https://p2ia-kaligo.com>



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Artificial Intelligence and education

ADAPTIV'MATH

Adaptiv'Math offers mathematics modules for pupils.

By building a "personalization engine" equipped with artificial intelligence, Adaptiv'Math aims to strengthen the resources made available to teachers to unlock structural points in mathematics learning, ensure that the notions of the foundation for this discipline are anchored, and pave the way for enhanced personalization.

Adaptiv'Math offers them assistance based on:

- an initial test, questions developed by cognitive science researchers, to build clusters of students;
- the assignment of the same adaptive path to each cluster of students;
- regular analysis of results by clustering algorithms to reconfigure clusters;
- the final individual evaluation at the end of the course.

At each of these stages, the analysis of the results is transmitted to the teachers through dashboards and the students receive feedback.



<https://www.adaptivmath.fr/>

Site compagnon
Adaptiv'MATH



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Artificial Intelligence and education

SMART ENSEIGNO

Smart Enseigno offers students and teachers digital AI-based assistance to personalize learning and notional acquisitions in most areas of basic mathematics.

AI is based on two complementary means: reasoners to build new information from existing information in the semantic web model; machine learning to gradually refine and improve existing algorithms through user actions.

The design of resources using generators designed by Cabrilog allows a more flexible and dynamic coupling with AI than a set of juxtaposed resources would allow. From the beginning, a generator is designed as dependent on variables (or even parameters) determined by a didactic analysis.

Instead of a fixed and discreet resource grid, the project aims at a flexible grid that adjusts more finely to the needs of the students.



Site compagnon Smart
ENSEIGNO

<https://www.smartenseigno.fr/>



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Artificial Intelligence and education

MATHIA

The MATHIA project proposes a device to support students through natural dialogue and holographic representation on digital media (teacher's tablet or smartphone). The MATHIA assistant is a device that exchanges with the student in a natural language conversation: the student learns and progresses by speaking, trying and having fun.

MATHIA aims to allow students, alone or in groups, to interact orally with an AI represented by a friendly robot that makes them discover mathematical concepts, trains them, encourages them, answers their questions, and makes them work collectively over a more or less long period of time.

Designed to function entirely orally, it is suitable for children with motor disorders, or for those with DYS-type disorders, including dyslexia and dyspraxia.



<https://mathia.education/>

Site compagnon Mathia



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Artificial Intelligence and education between europeans

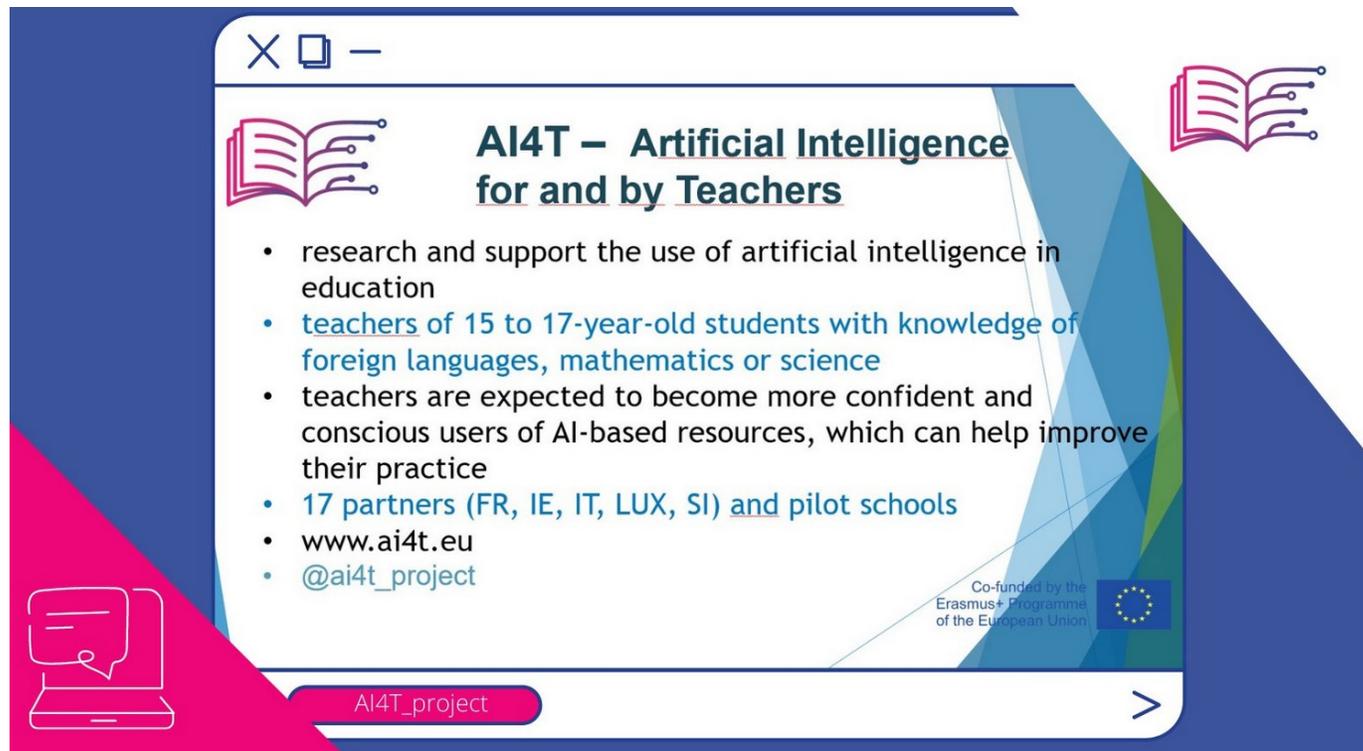
AI for Teachers (AI4T)

What is AI4T ?

#AI4teachers @AI4T_project



An Erasmus+ K3 project designed by **France, Slovenia, Italy, Ireland** and **Luxembourg** to contribute to training on AI in education for and by teachers and school leaders on a perimeter voluntarily restricted to **mathematics, science** and **modern English language** in **high school** (pupils aged 15-16).



AI4T – Artificial Intelligence for and by Teachers

- research and support the use of artificial intelligence in education
- **teachers of 15 to 17-year-old students with knowledge of foreign languages, mathematics or science**
- teachers are expected to become more confident and conscious users of AI-based resources, which can help improve their practice
- **17 partners (FR, IE, IT, LUX, SI) and pilot schools**
- **www.ai4t.eu**
- **@ai4t_project**

Co-funded by the Erasmus+ Programme of the European Union

AI4T_project



AI4T @AI4T_project

Yesterday, the representative of the Slovenian partners of the Ministry Borut Čampelj, @bcampelj, presented the #AI4teachers project at the @ETUCE_CSEE final conference of the #eSpeed project in the context of CPD on digital pedagogy.
[@EUErasmusPlus](#) [@DigitalEU](#)

Traduire le Tweet

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Source : @AI4T_project - 15/10/2021

Artificial Intelligence and education between europeans

Why AI4T?

To give teachers the ability to analyse, in their professional practice, educational resources that include elements of AI and **to address with confidence the major challenges of AI in education**, in particular the ability to explain to students the data and natures of AI used and their purpose.

To use and master school data, in particular learning traces, **to improve differentiation of pathways and learning**, to provide more effective training and assessment of upper secondary students, without leaving decisions to AI.

To help teaching professionals trained with the contributions of AI: assistance in pedagogical diagnosis and assessment, perception of weak signals; understanding of learning strategies and processes; development of data-visualisation tools for monitoring learning, etc.).

Responding to the orientations set by the **European Commission's new Digital Agenda for Education** (new DEAP 2021-2027), aligned with many orientations of member countries like **Slovenia** and **France**.

Artificial Intelligence and education between europeans

AI4T, how?

The project is based on the construction of a **training course on how to use AI tools for secondary school teachers** - designed on the basis of the IAI Class'Code MOOC and its adaptation and/or enrichment based on the needs and experiences of the participating countries.

Teachers will test and use digital educational resources integrating AI bricks offered by various publishers.

The training content will be provided in all the languages of the consortium and it is expected that the training created will be able to meet the needs of all types of teachers, thus **facilitating scaling up and systemic change**.

Artificial Intelligence and education



For girls and boys, by women and men, for humanity.

Artificial Intelligence and education

Presentation of P2IA and the six digital services:

<https://eduscol.education.fr/1911/parteneriat-d-innovation-et-intelligence-artificielle-p2ia>

Rapport Villani #AIForHumanity

<https://www.aiforhumanity.fr/en/>

Carnet hypothèses Directorate for digital technology for Education,
bibliography AI and education

<https://edunumrech.hypotheses.org/2369>

MOOC IAI - Intelligence artificielle avec intelligence

<https://pixees.fr/classcode-v2/iai/>

AI4T

<https://www.ai4t.eu/>

On Artificial Intelligence - A European approach to excellence and trust - EU (19 février 2020)

https://ec.europa.eu/info/sites/default/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf

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