Use of AI by teachers

Pedagogical practices and limitations

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UNIVERSITY OF SOUSSE
جامعة سوسة
Socially Responsible University

CIPEN Cellule d'Innovation Pédagogique Et Numérique

ISITCom
المعهد العالي للإعلامية و تقنيات الإتصال - حمام سوسة

مخبر البحث
PRINCE Lab
Pôle de Recherche en INformatique du CEntre

Biography

Associate professor with « Habilitation à Diriger des Recherches » (HDR) Sousse University

Tunisia, A graduate of the University of Braunschweig in Germany

PhD was realized in collaboration with the University of Hannover in Germany.

Member of the International Scientific Council of Francophone Universities Agency

Head of the regional committee of scientific an socio economic experts North Africa AUF.

Two awards: First National Prize for Academic Excellence of the President of the Tunisian Republic (July 1998), Graduate Merit Award TU Braunschweig, Germany (October 1997).

Coauthor of the first Computer Sciences MOOC in Tunisia , deployed on FUN in 2015

Head of Pedagogical Innovation and digital learning Unit : AUF Institutional Award for Pedagogical Innovation

Vice President (for higher Education) of International Network for pedagogical innovation and Training of trainers

UNESCO Chair : OPEN EDUCATION : INNOVATION INCLUSIVE INTELLIGENT LEARNING

Outline

1. General Context
2. AI in Digital education
3. Results of Research projects
4. Challenges for AI in Learning & Assessment

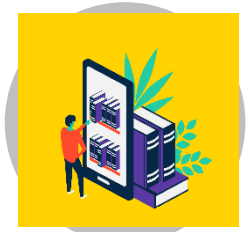
General context

Evolution of Learning

Transmissive learning

Active learning

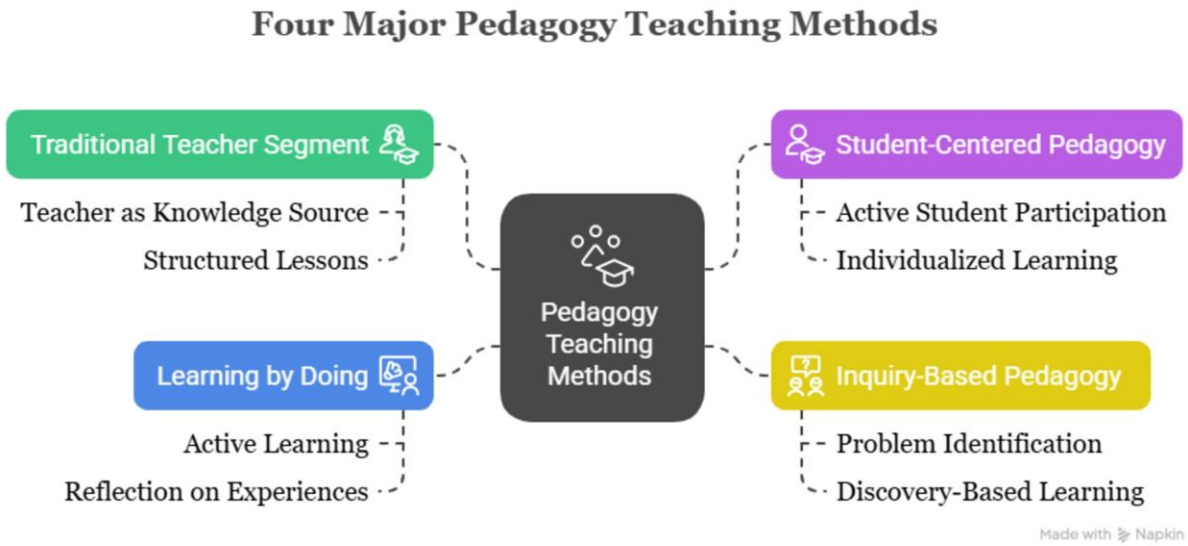
Social learning



Mobile / Pervasive / Intelligent Learning

Innovative education

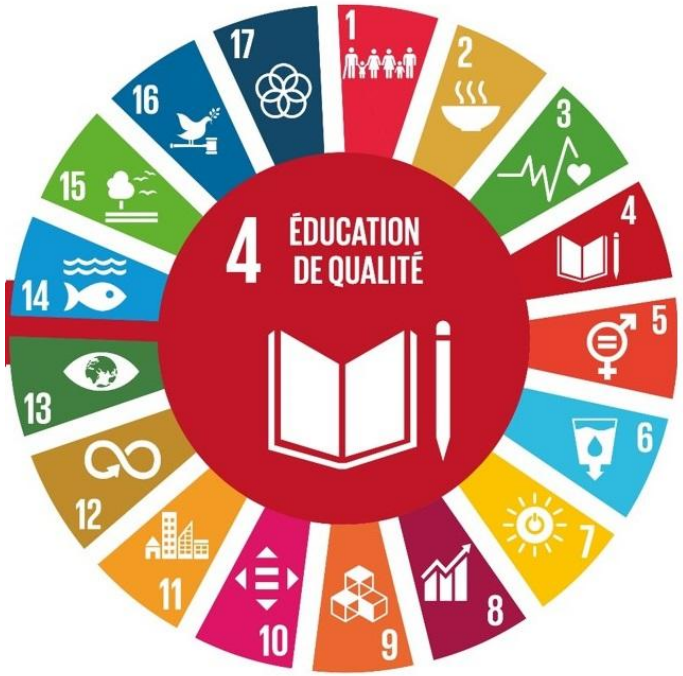
- **Education** is the **transmission of knowledge between generations**
- **Two major issues**: Knowledge and its transmission
- Today the teacher is supposed **to be competent on both aspects** but for the university **for a long time only the first issue was important**

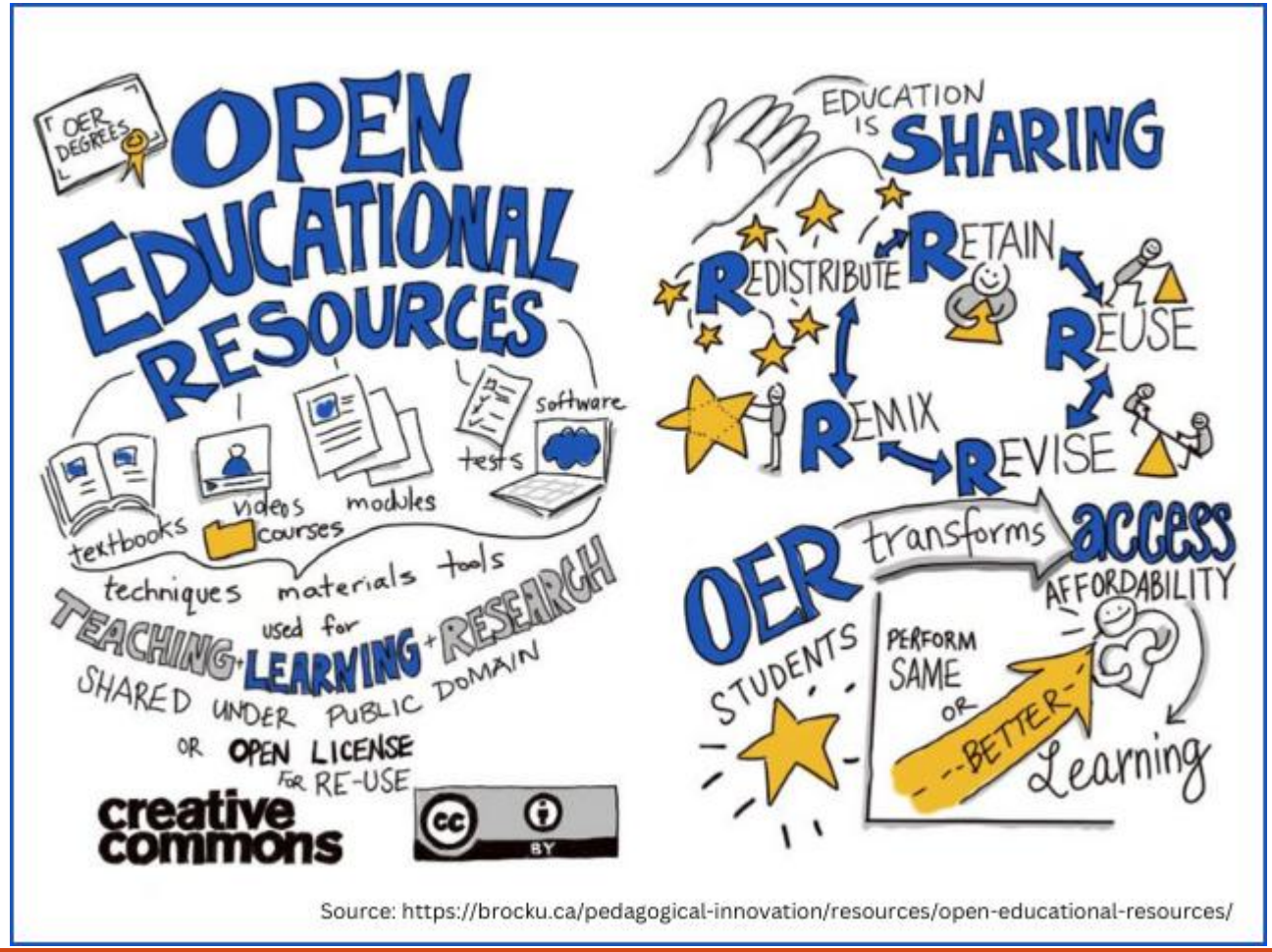


Colin de la Higuera **Intelligence artificielle et éducation : Peut-on remplacer un enseignant par une machine ?, 2022**

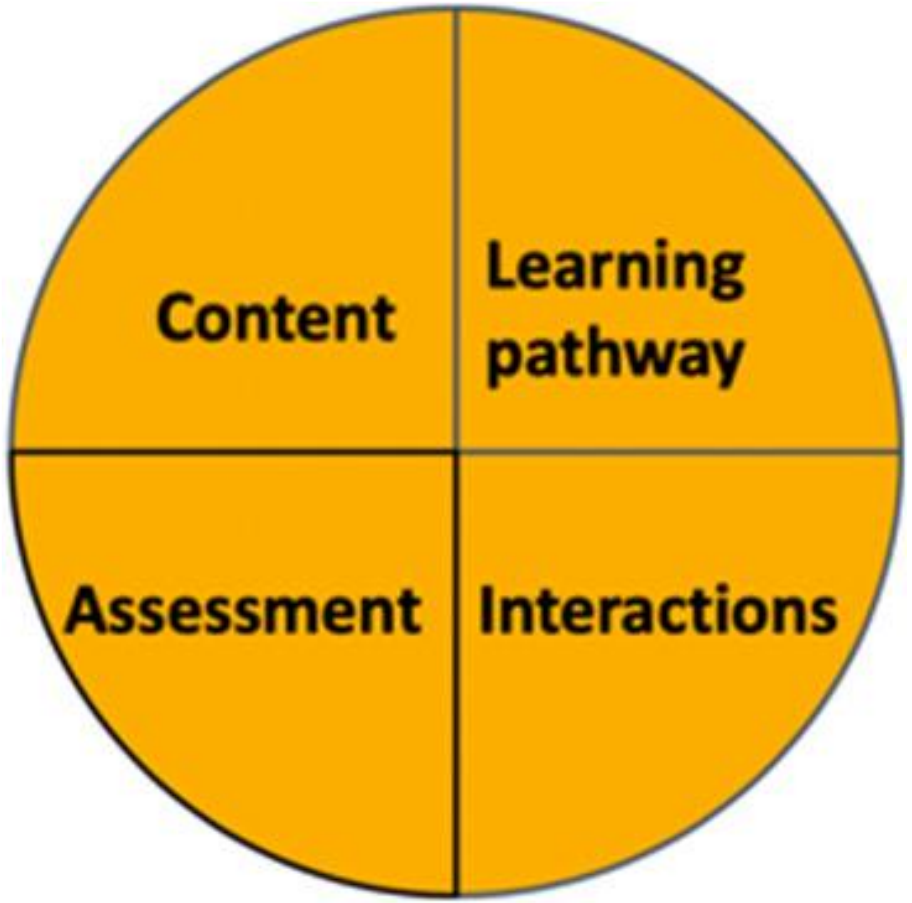
SDG4 & Open Education

Ensure **inclusive** and **equitable** quality education and promote lifelong learning opportunities for all.





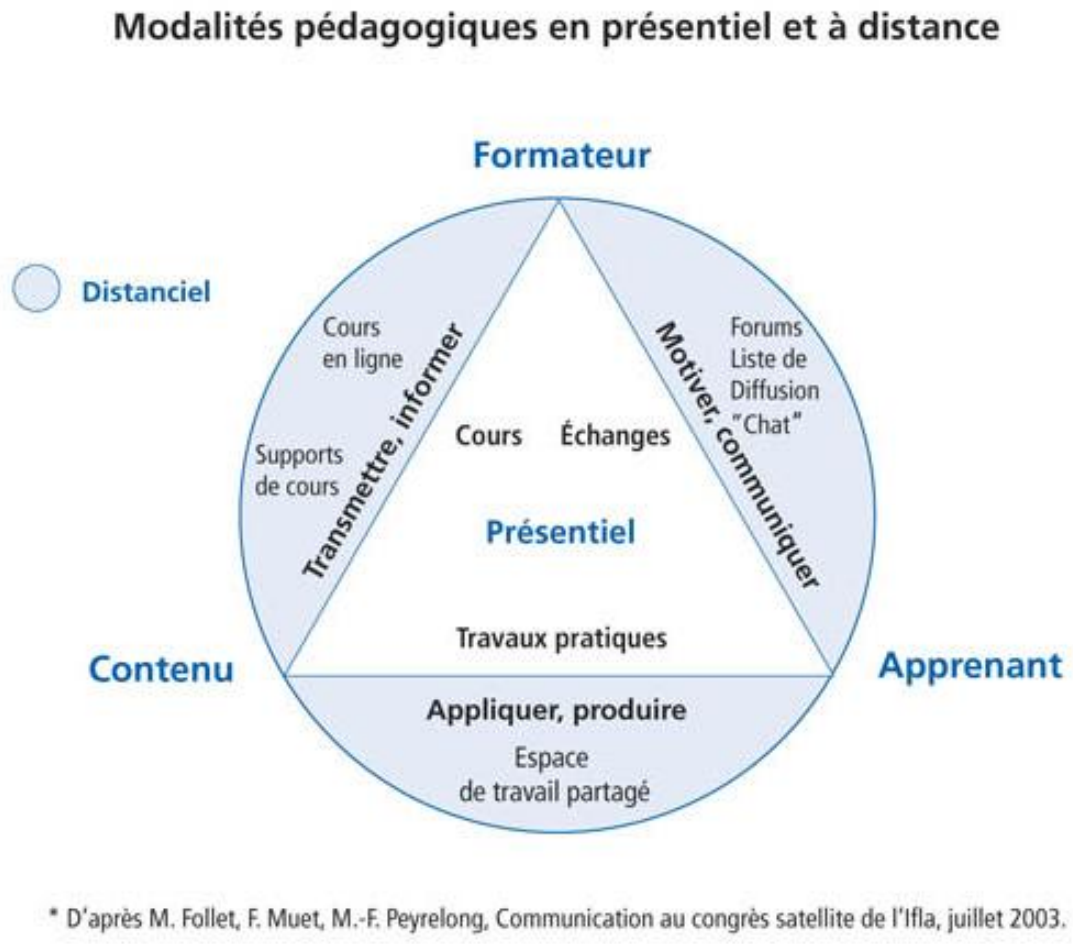
Orientations

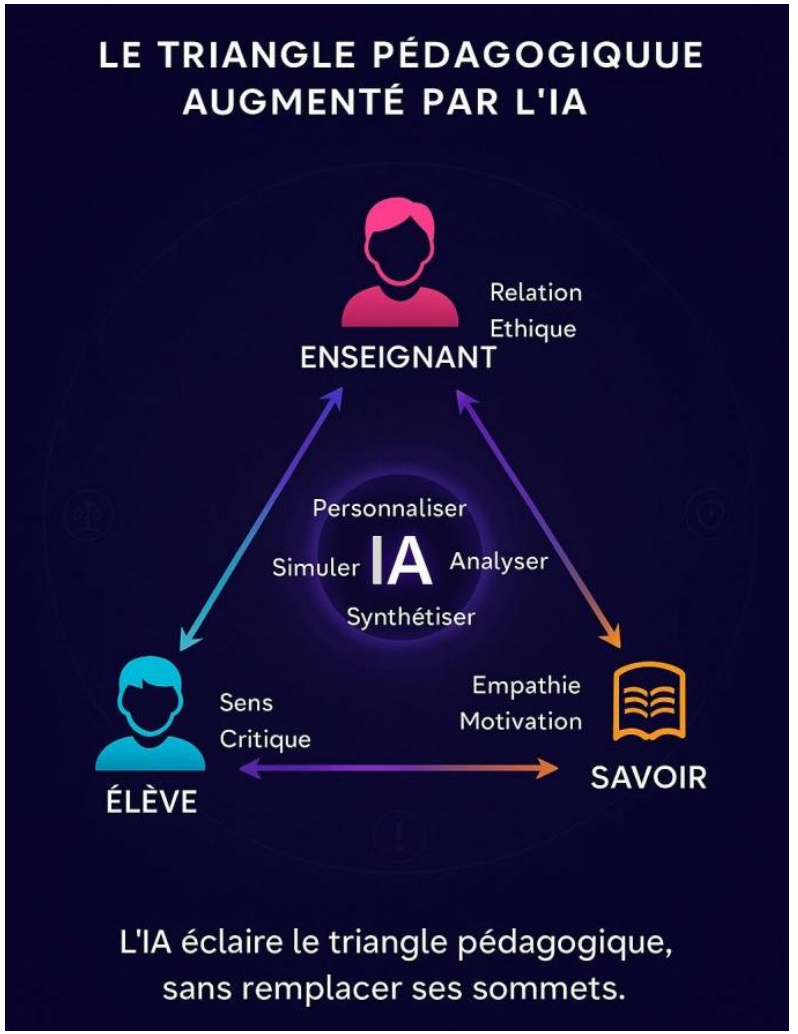


Jacqmot, C., DEVILLE, Y., & DOCQ, F. (2020). A Framework to Understand, Analyse and Describe Online and Open Education in Higher Education.

AI & Digital Education

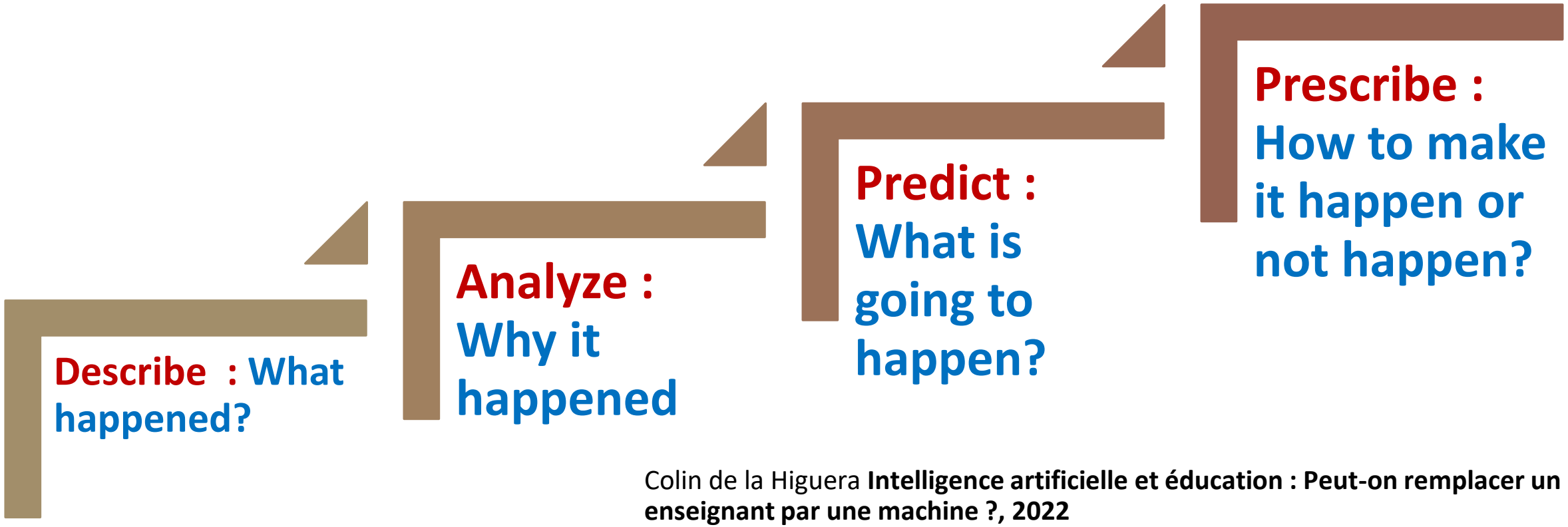
Didactic Triangle



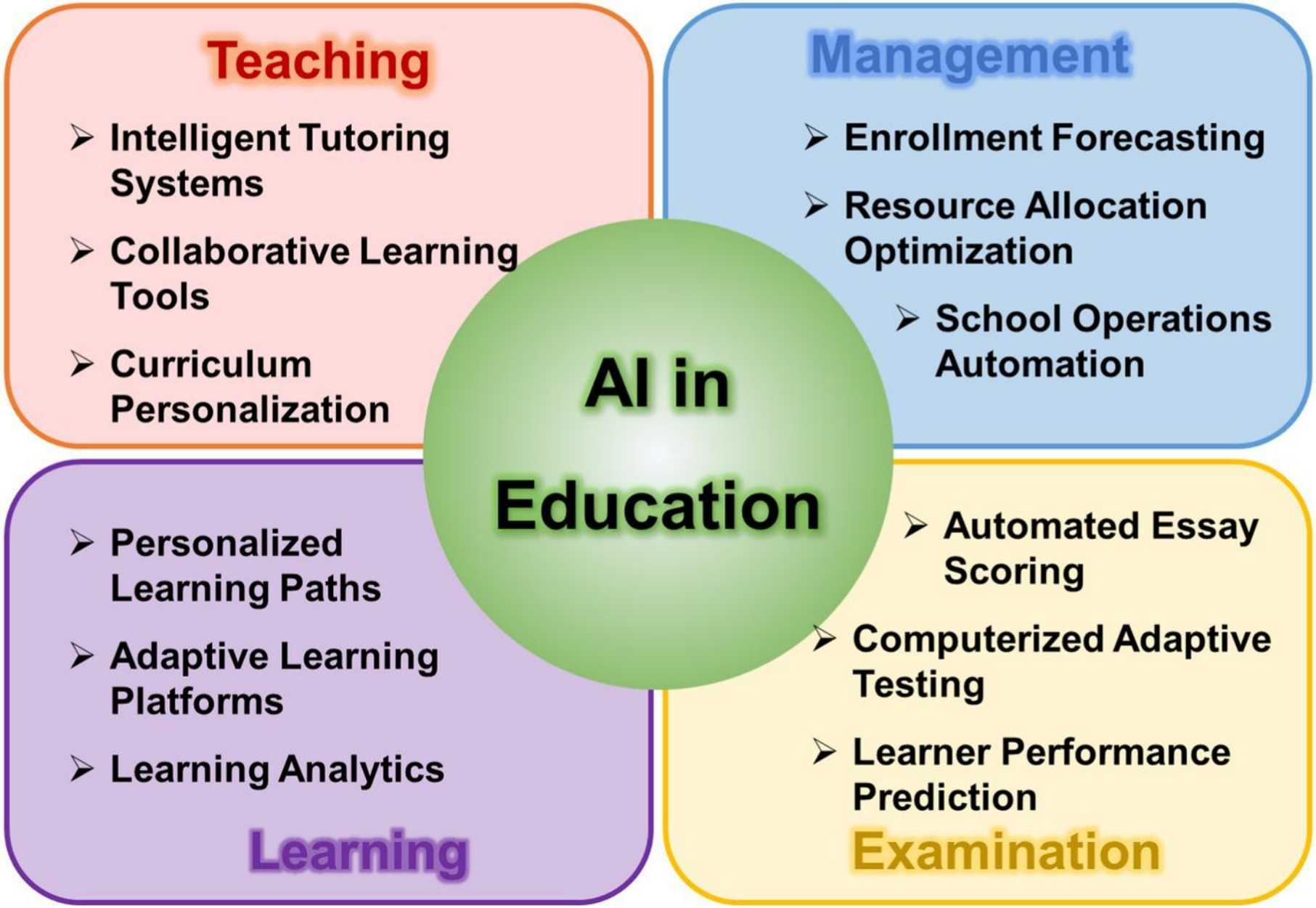


AI becomes a **fourth actor** and acts as a central prism that filters, enriches, accelerates, and personalizes pedagogical interactions.”

Use of AI in Education



Colin de la Higuera **Intelligence artificielle et éducation : Peut-on remplacer un enseignant par une machine ?, 2022**


Teaching
Intelligent Tutoring Systems
Collaborative Learning Tools
Curriculum Personalization
Management
Enrollment Forecasting
Resource Allocation Optimization
School Operations Automation
AI in Education
Personalized Learning Paths
Adaptive Learning Platforms
Learning Analytics
Learning
Automated Essay Scoring
Computerized Adaptive Testing
Learner Performance Prediction
Examination

AI & Assessment

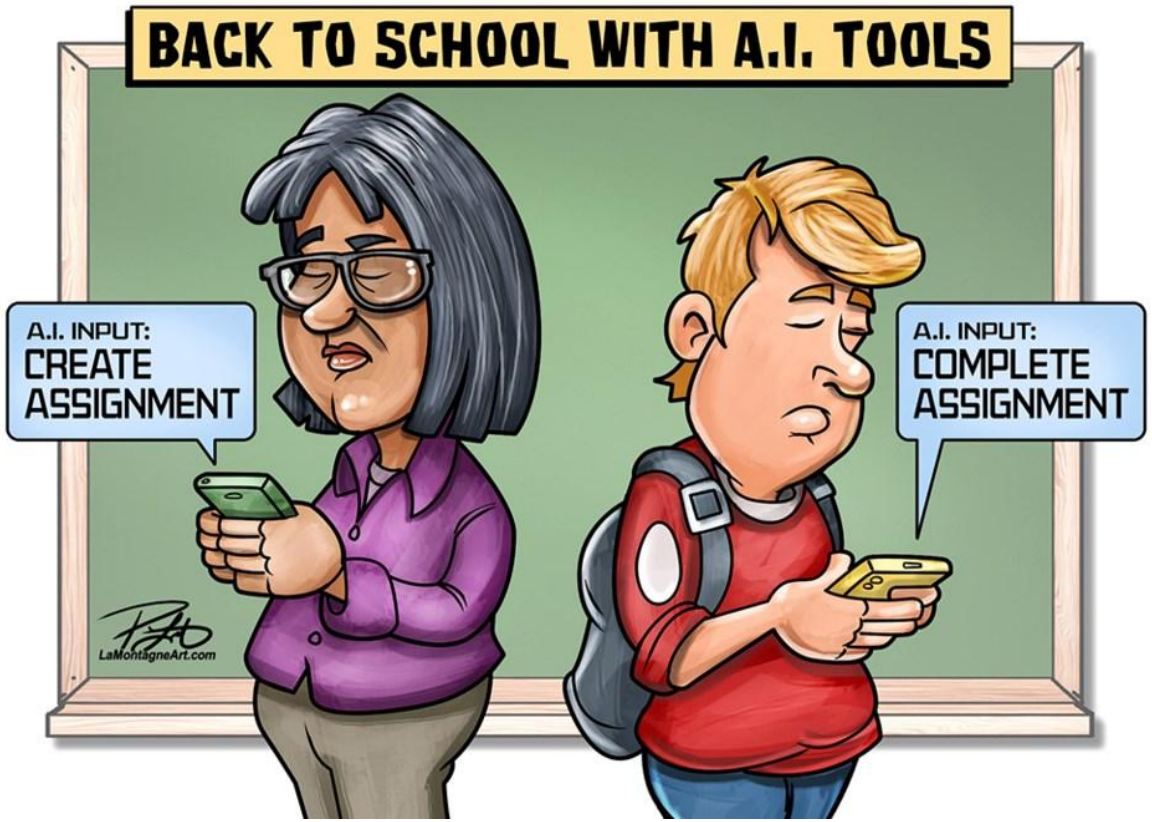
- AI is transforming education → **reshaping teaching & assessment**
- **Assessment is a critical but challenging component.**
- **Traditional assessment limitations** → lack of adaptivity, fairness, personalization
- **Complexities in Evaluating Student Work in AI Era:**
  - **Differentiation Issues:** Difficulty in distinguishing between student-generated content and AI-generated content
  - **Lack of Process Evaluation:** Traditional methods focus **primarily on final outputs**, often **missing insights into students' problem-solving** and decision-making processes

CAMPUS · INTELLIGENCE ARTIFICIELLE

A l'heure des IA, la révolution silencieuse des examens : « La question n'est plus de savoir s'il faut s'opposer, mais comment on va vivre avec »

Les enseignants du supérieur réinventent leurs méthodes d'évaluation. L'oral prend désormais plus de place et les établissements passent de la simple détection à l'intégration de ces outils d'intelligence artificielle.

New needs



Need for new environments:

- **Rethinking** the relationships between teachers and students.
- **Supporting** teachers & learners to use AI
- **Designing** innovative scenarios using AI

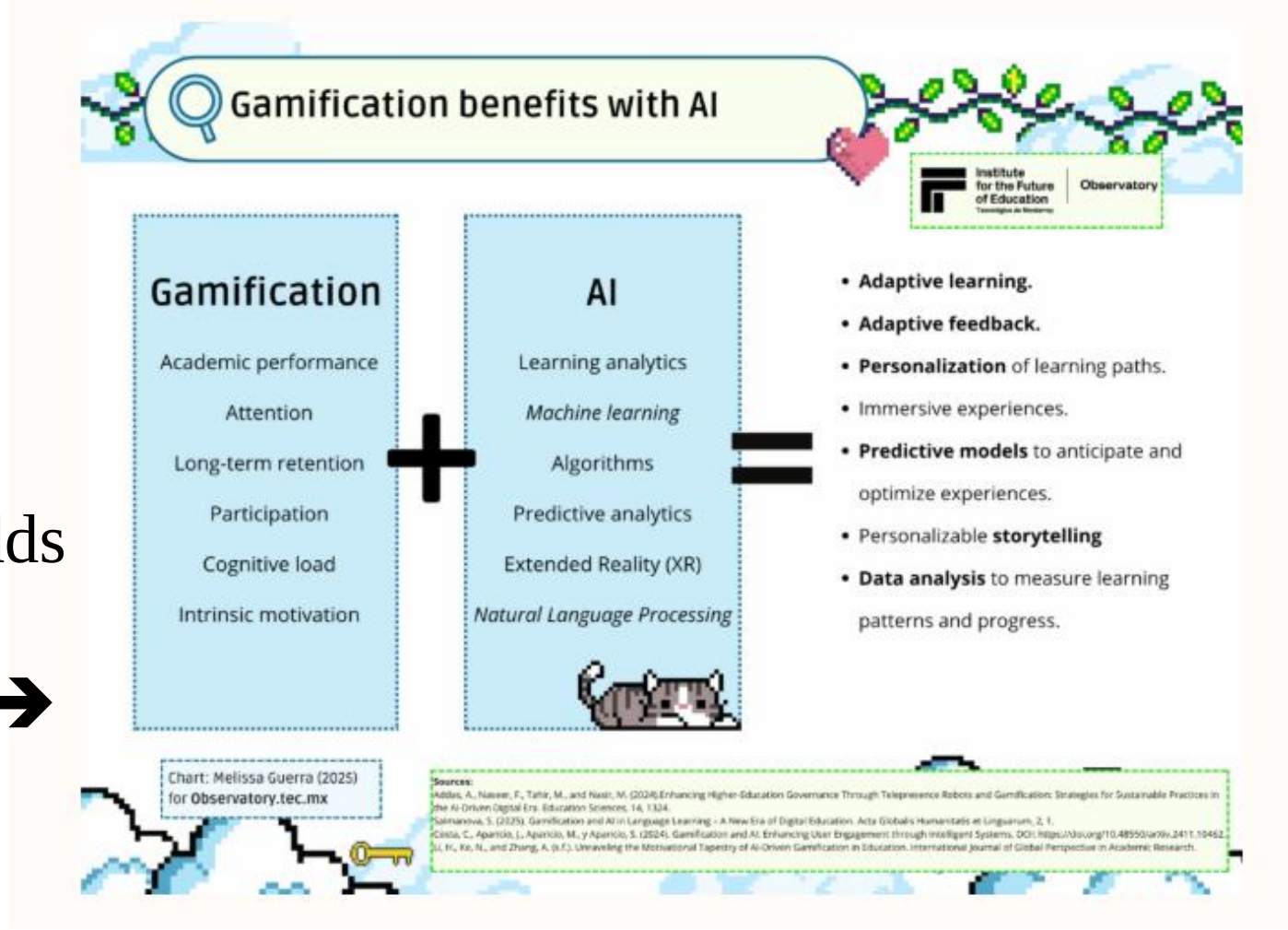
Results of projects

AI in Gamified Environments

Gamification & AI

- **Effective assessment** plays an important role in **assessing knowledge acquisition and fostering skill development**.

- The integration of Gamification adds an **interactive and engaging dimension** to these environments ➔ **Opportunities for immersive learning experiences**.



Erasmus EduGAME

Goal : To train prospective school-teachers in social sciences, humanities, and IT to utilize educational technologies, AI and Serious games for Teaching.

November 2023-October 2026

Project Consortium

The EduGame project is implemented by a consortium of **nine universities** from **Europe, the Western Balkans, and the South-Mediterranean**:

European Higher Education Institutions (HEIs):

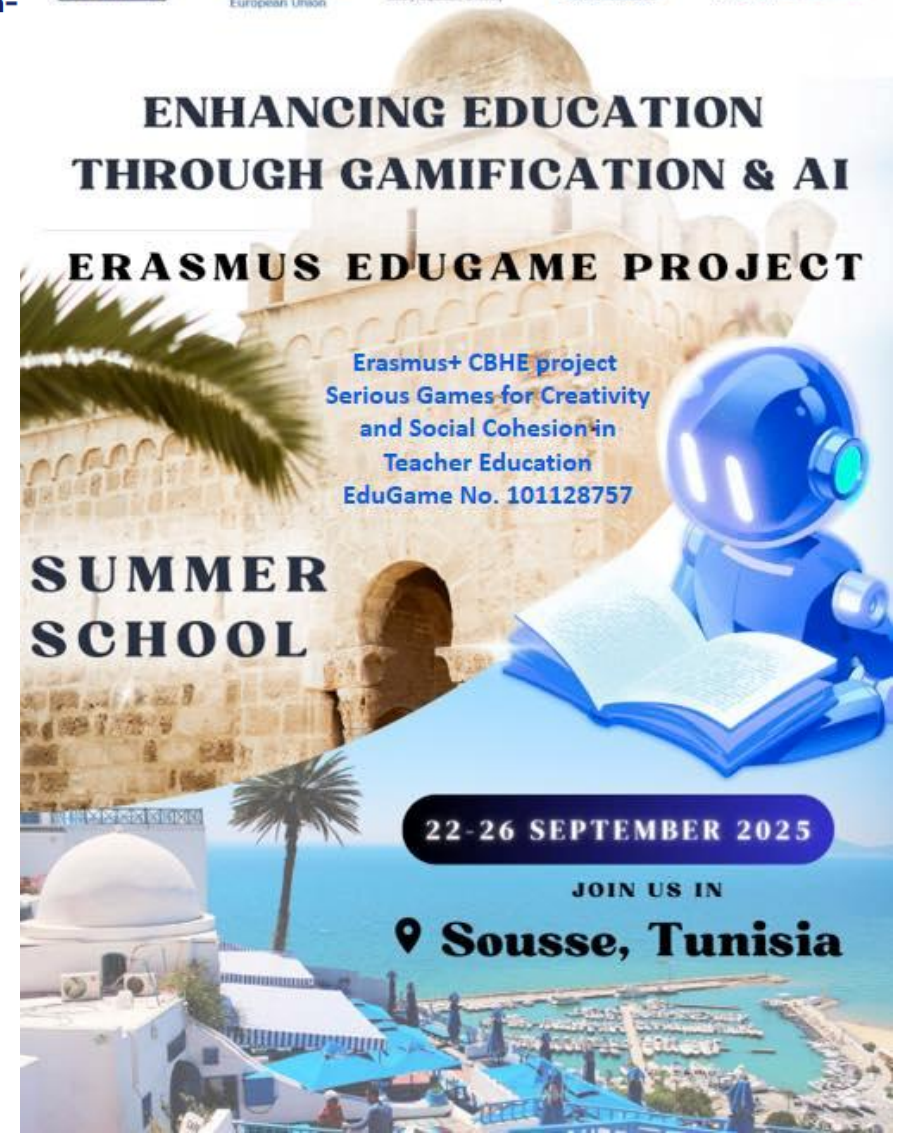
- **Vytautas Magnus University (VMU)** – Coordinator, Lithuania
- **Universitat Politècnica de València (UPV)** – Spain
- **Università degli Studi di Salerno (UNISA)** – Italy

South-Mediterranean HEIs:

- **University of Sousse (US)** – Tunisia
- **University of Jendouba (UJ)** – Tunisia

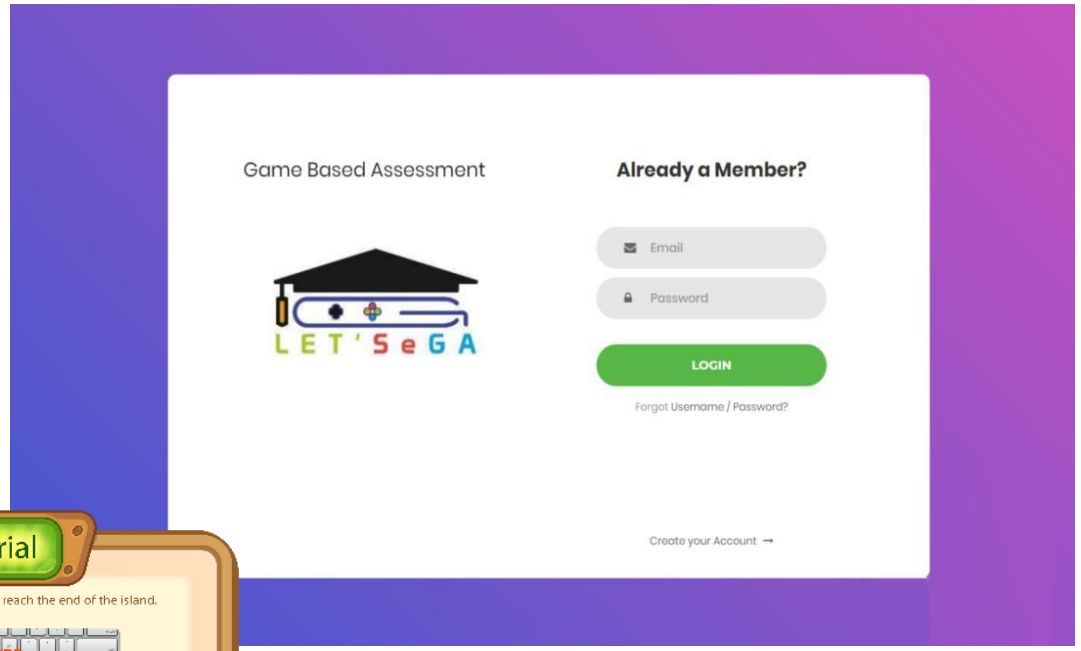
Western Balkans HEIs:

- **Džemal Bijedić University of Mostar (UNMO)** – Bosnia and Herzegovina
- **University of Bihać (UNBI)** – Bosnia and Herzegovina
- **University of Tirana (UT)** – Albania
- **University of Elbasan 'Aleksandër Xhuvani' (UNIEL)** – Albania

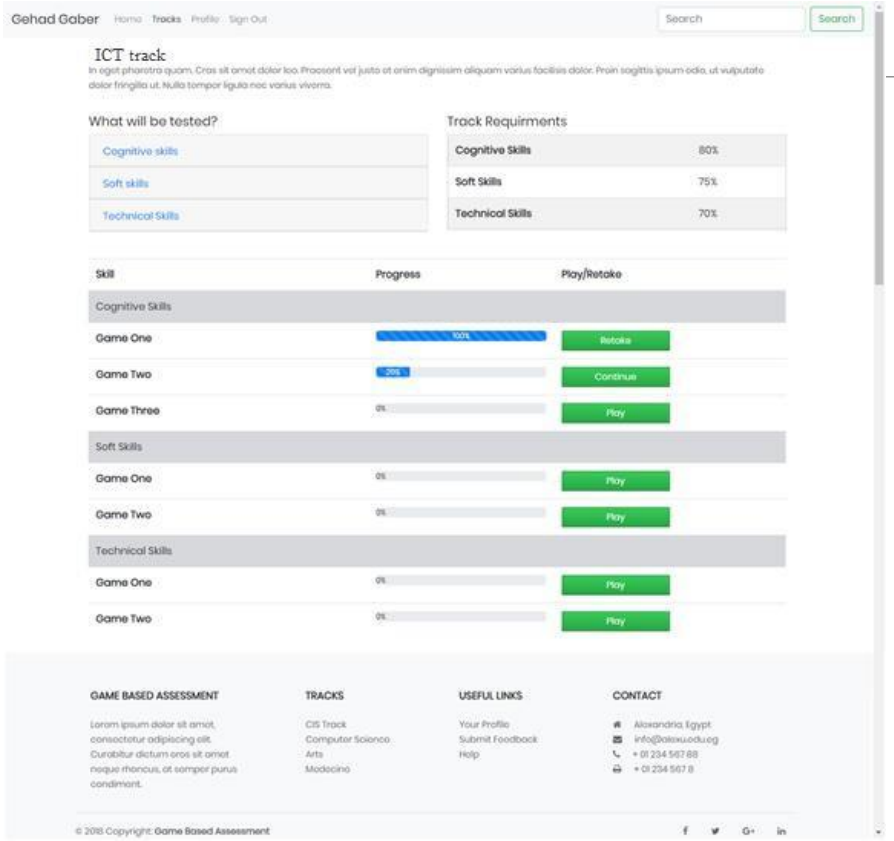


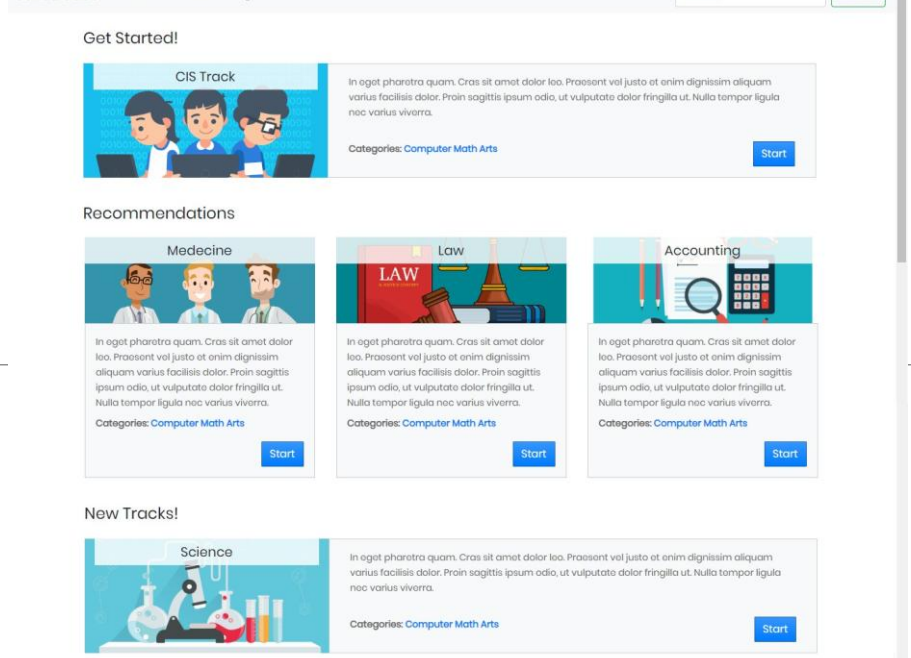
LET'SEGA Project

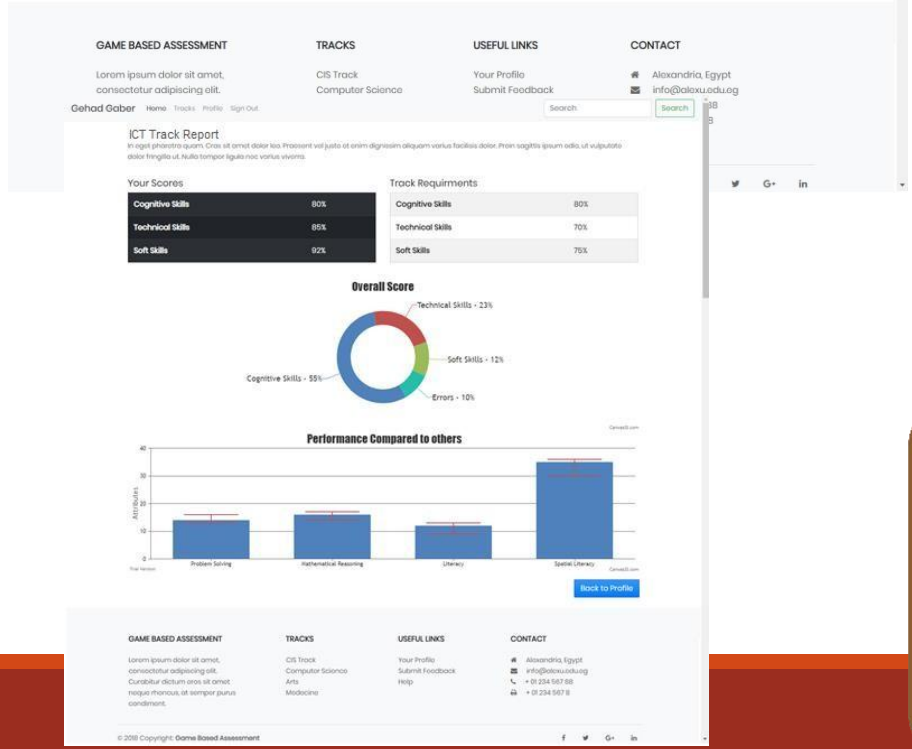
- **LET'SEGA : Lebanon, Egypt Tunisia Serious Games for Assessment**
- **Partners**
  - Alexandria University Egypt
  - AUL University Lebanon
  - Sousse University Tunisia
- **June 2018 – June 2020**

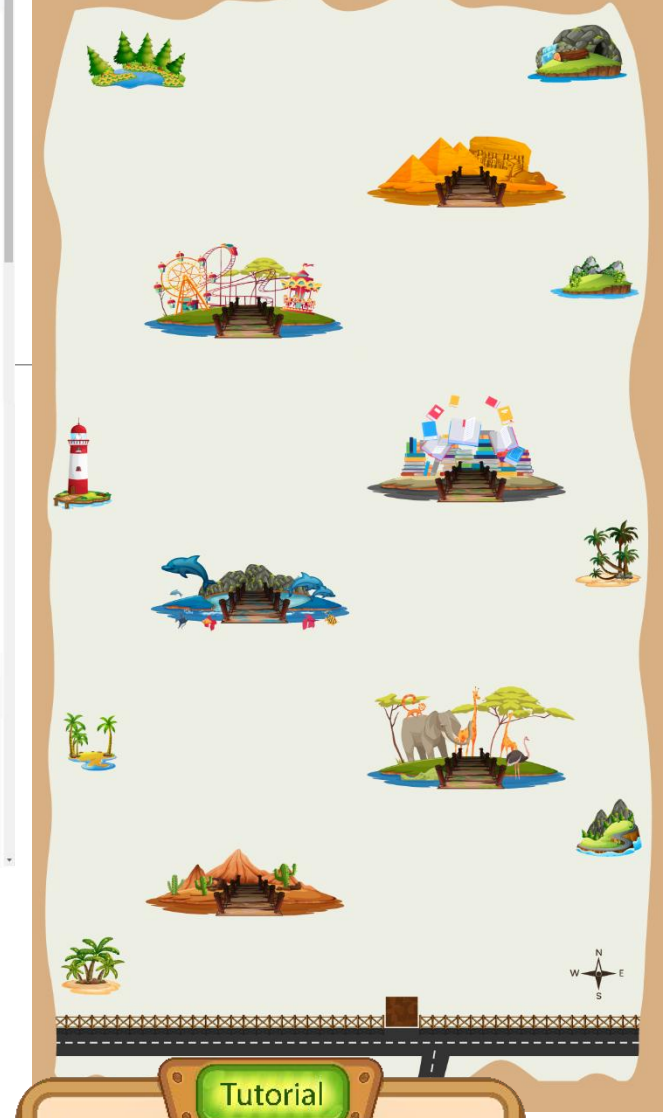


LET'SEGA Framework



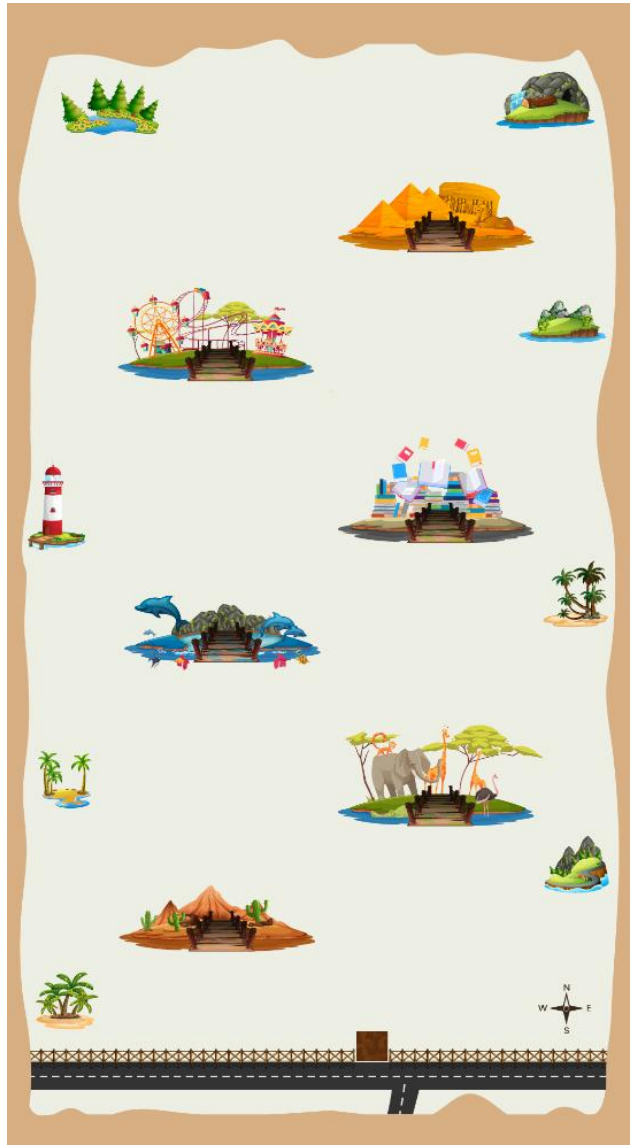






Results LET'SEGA

- Co-supervision and defenses of Master's research theses in Computer Science for **11 students from three countries**
- Development of an **intelligent, game-based framework** for competency assessment to support academic pathway selection
- **10 scientific publications**
- Organization of 3 special sessions in International Conferences
    - IEEE AIKE conference (Artificial Intelligence and Knowledge Engineering) 2019
    - IEEE AMCAI 2025 & 2023
- Scientific visits and mobility opportunities for students and researchers in partner countries



Game Based Learning & Stealth Assessment

Embedded and invisible

Assessment happens naturally inside digital and collaborative eLearning activities.

Authentic evidence

Captures what learners do (skills, decisions, interactions) rather than only test answers.

Continuous process

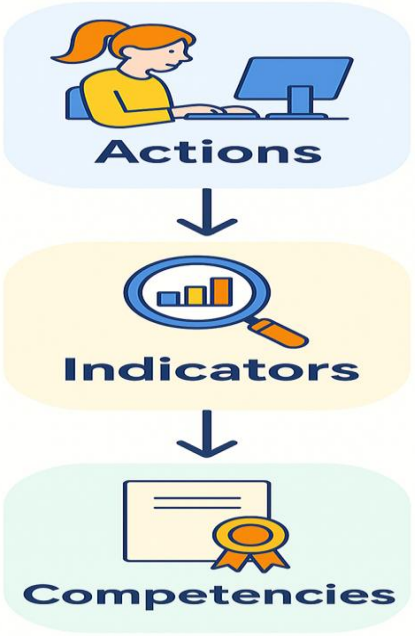
Evaluation occurs throughout learning without interrupting progress.

Lower stress

Reduces test anxiety and supports more natural engagement in collaborative tasks.

Steps & Indicators

- **Mapping to indicators & competencies:** Actions are transformed into meaningful measures of learning. This process ensures assessment is **continuous**, **invisible**, and **tied directly to authentic learning activities**.
- Indicators = measurable patterns in learner actions that provide evidence of skills and behaviors.

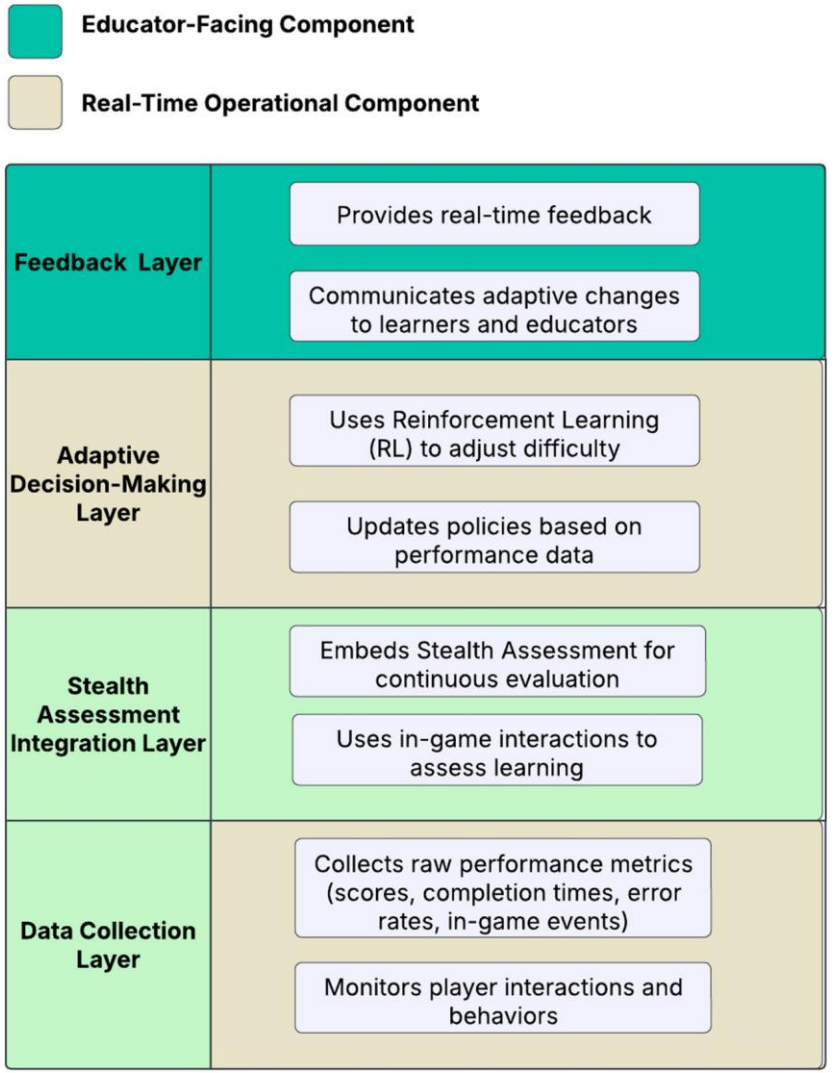


Examples :

- **Number of retries (Nombre de tentatives)** → persistence
- **Turn-taking frequency** → teamwork
  Hint usage → self-regulation
  Error correction speed → problem-solving
- **Navigation choices** → strategy and planning
- **Time on task** → engagement

Adaptive Difficulty in collaborative Game Based Learning

- Application of **reinforcement learning-based dynamic difficulty adjustment (DDA) algorithms** in collaborative game-based learning environments
- **Adaptation in gaming environments is essential for providing personalized learning experiences** that adapt to a wide range of learner needs.
- DDA algorithms are **commonly** used to adjust game difficulty **for individual performance**, **Research on their effectiveness in collaborative settings remains limited.**



Computer Applications in Engineering Education

RESEARCH ARTICLE | Open Access

Adaptive Difficulty and Stealth Assessment in Collaborative Game-Based Learning

Ameny Rjiba, Lilia Cheniti-Belcadhi, Judita Kasperiuniene

First published: 06 November 2025 | https://doi.org/10.1002/cae.70102 | VIEW METRICS

AI Based Open Assessment

Project : OpenMed Scholars

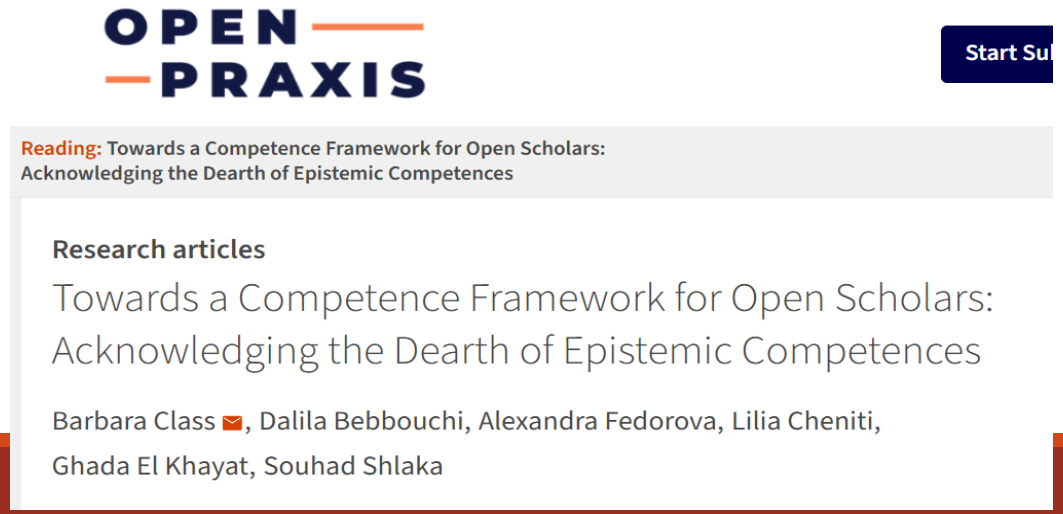
Title : Building on Open Science and Open Education Capacities across the Mediterranean to Support the Emergence of Open Scholars

2022 - 2024

https://tecfa.unige.ch/proj/OpenScholars/

Consortium	**Geneva University, Switzerland**
	Sousse University, **Tunisia**
	Research center for scientific Information, Alger, **Algeria**
	Mohammed 5 University Rabat, **Morrocco**
	Alexandria University, **Egypt**

Intelligent Environment for Competencies


OPEN PRAXIS

Start Su

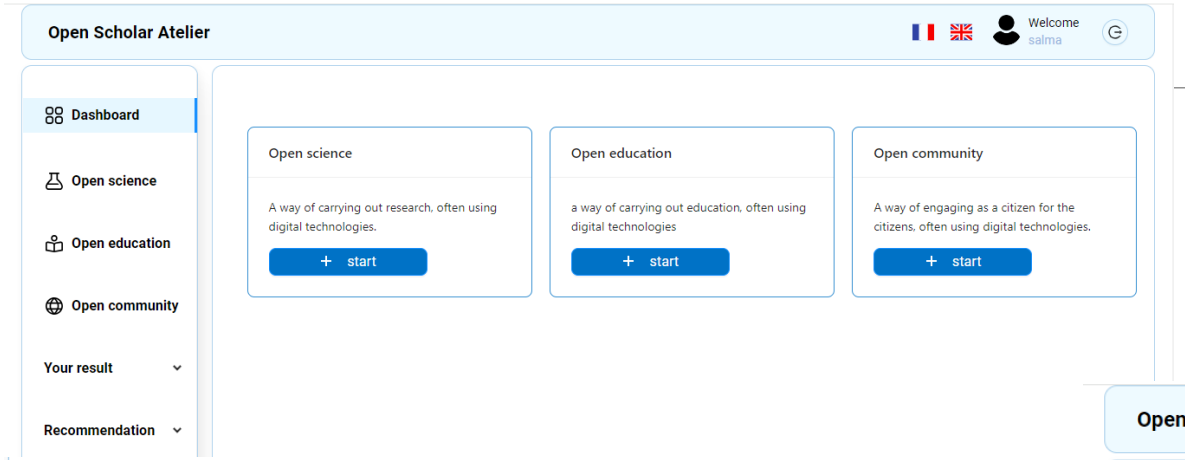
Reading: Towards a Competence Framework for Open Scholars: Acknowledging the Dearth of Epistemic Competences

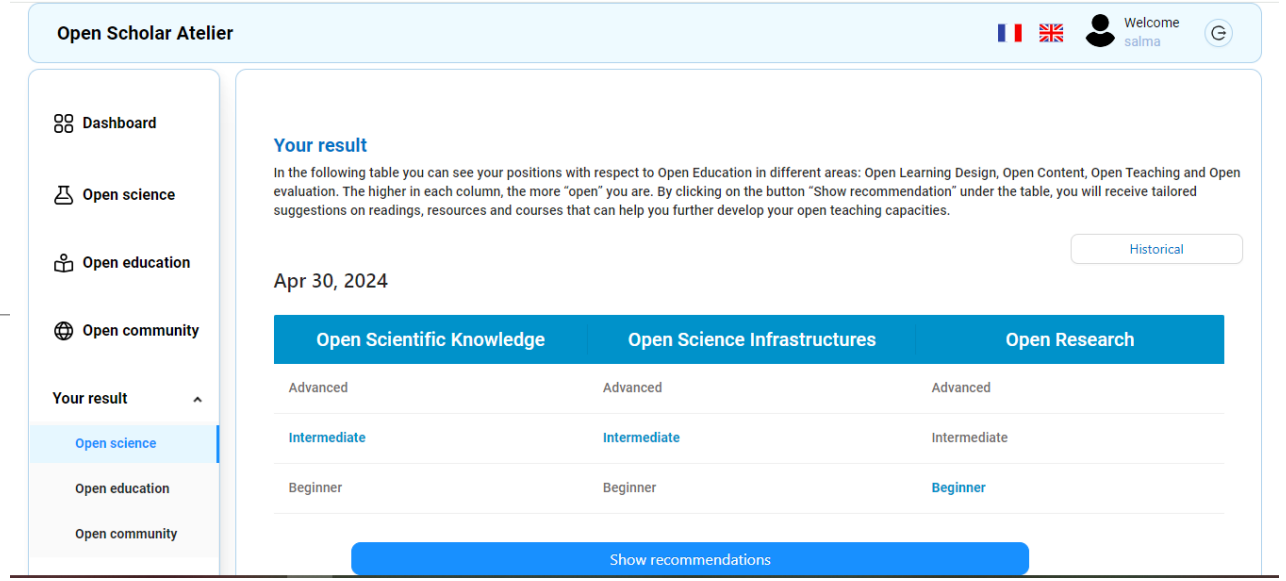
Research articles

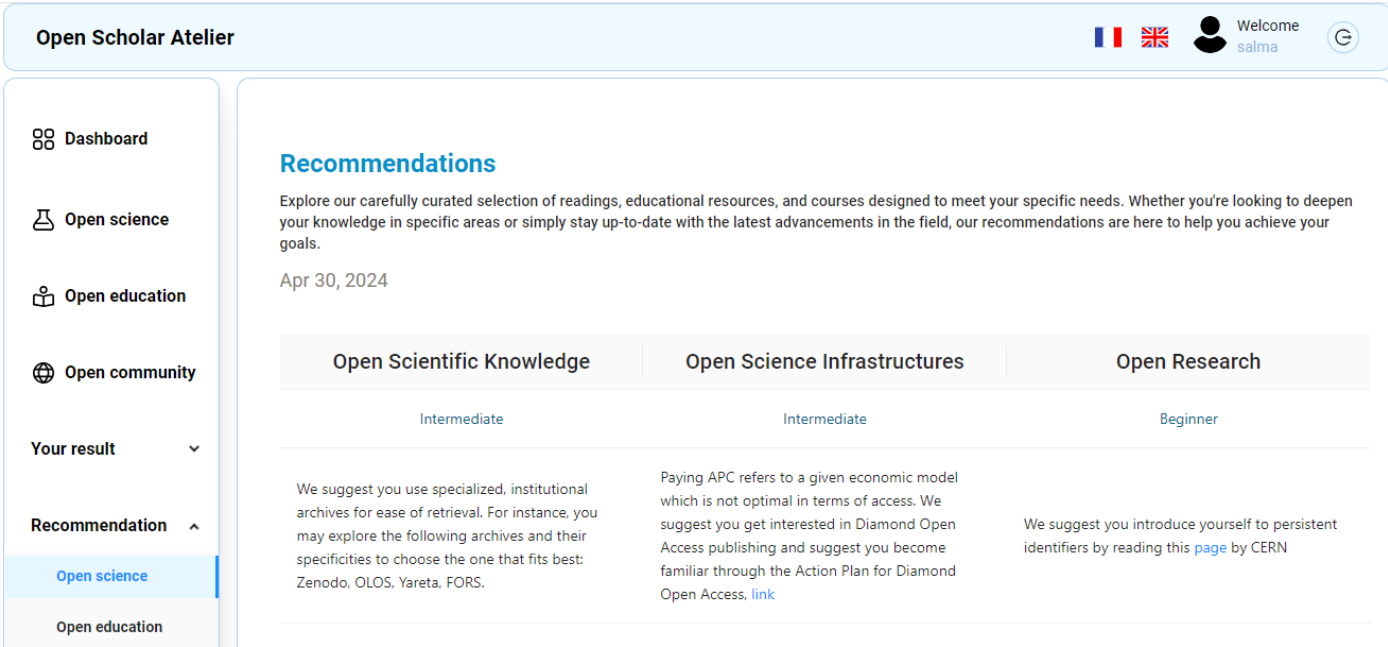
Towards a Competence Framework for Open Scholars: Acknowledging the Dearth of Epistemic Competences

Barbara Class, Dalila Bebbouchi, Alexandra Fedorova, Lilia Cheniti, Ghada El Khayat, Souhad Shlaka

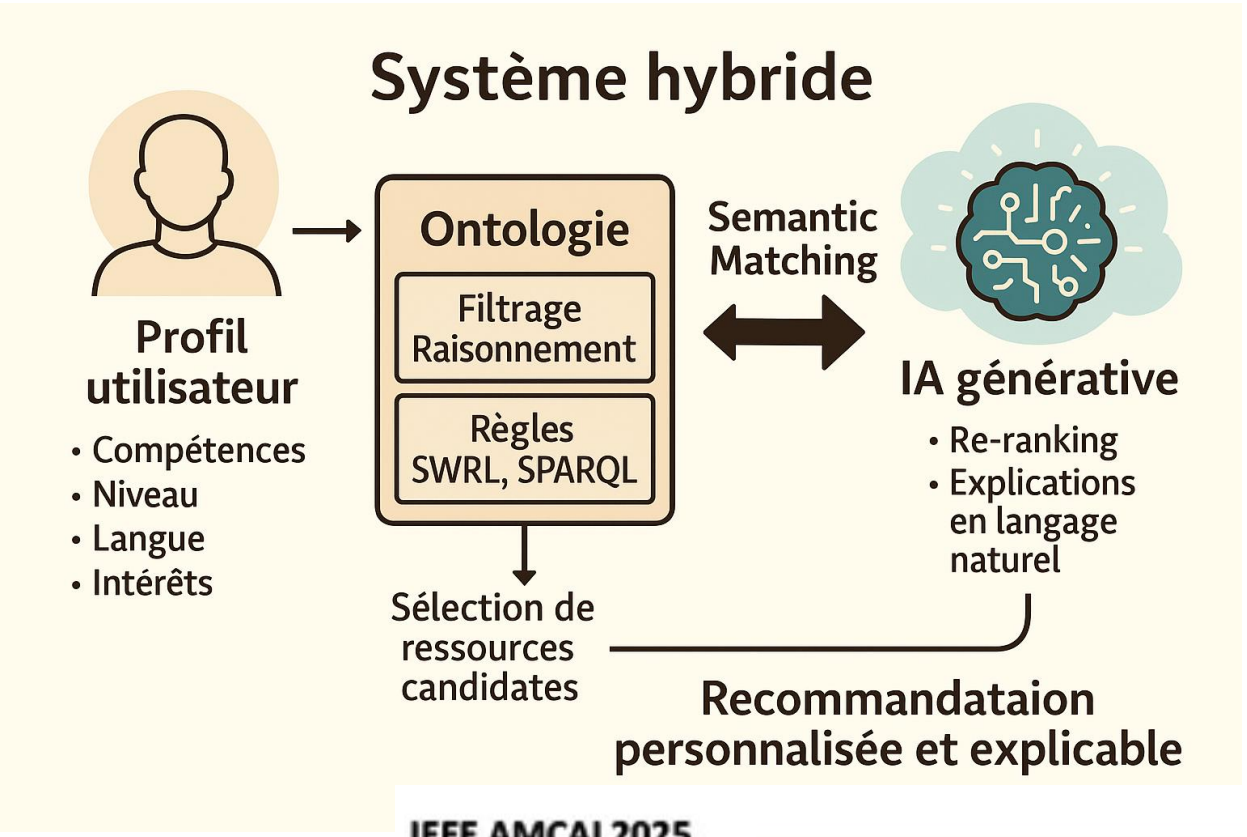
Open Med Atelier

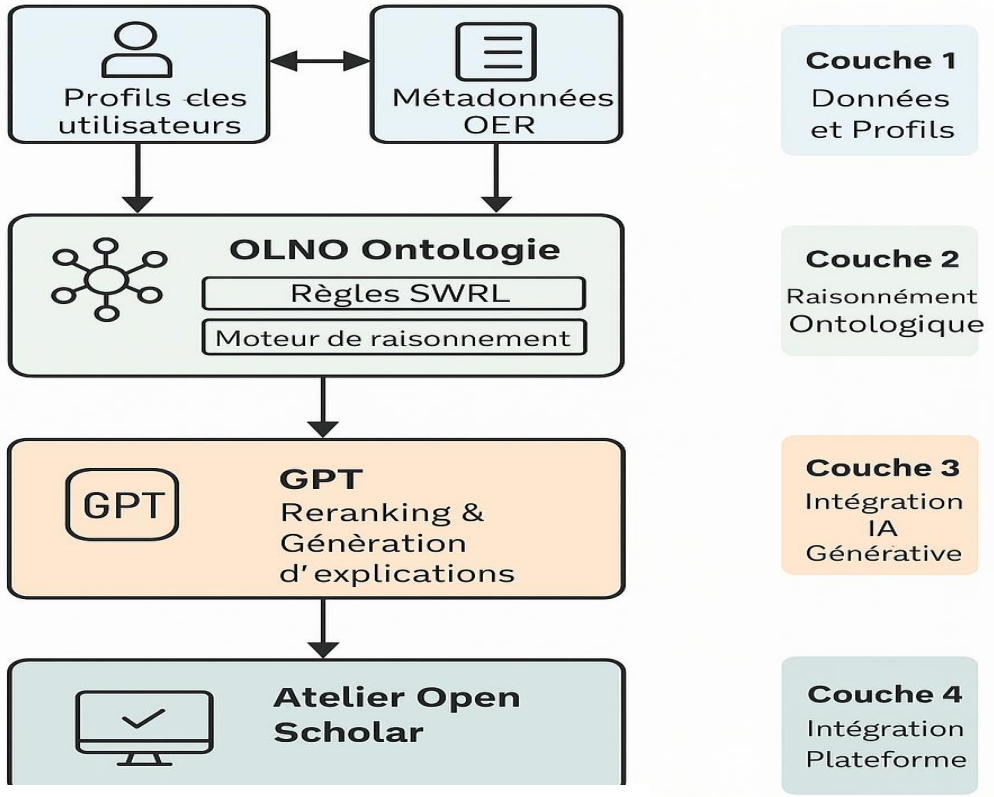






Framework for Open Recommendation





IEEE AMCAI 2025 14-16 October 2025

ID_104: Ontology-Driven Personalized Recommendation of Open Educational Resources: Modeling User Profiles and Learning Needs [Online]

Nermine Janfeoui, Asma Haydaoui and Lilia Cheniti

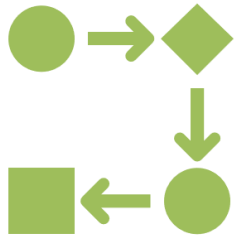
AI-Based Assessment in Collaborative Learning

Challenges and the Need for a Comprehensive AI-Driven Assessment

Challenges with Current Assessment Systems

Traditional methods focus only on final outputs, missing **critical aspects like cognitive processes and creativity**

Automated Grading Systems: Efficient but struggle to evaluate creativity and adaptability in AI-enhanced tasks.



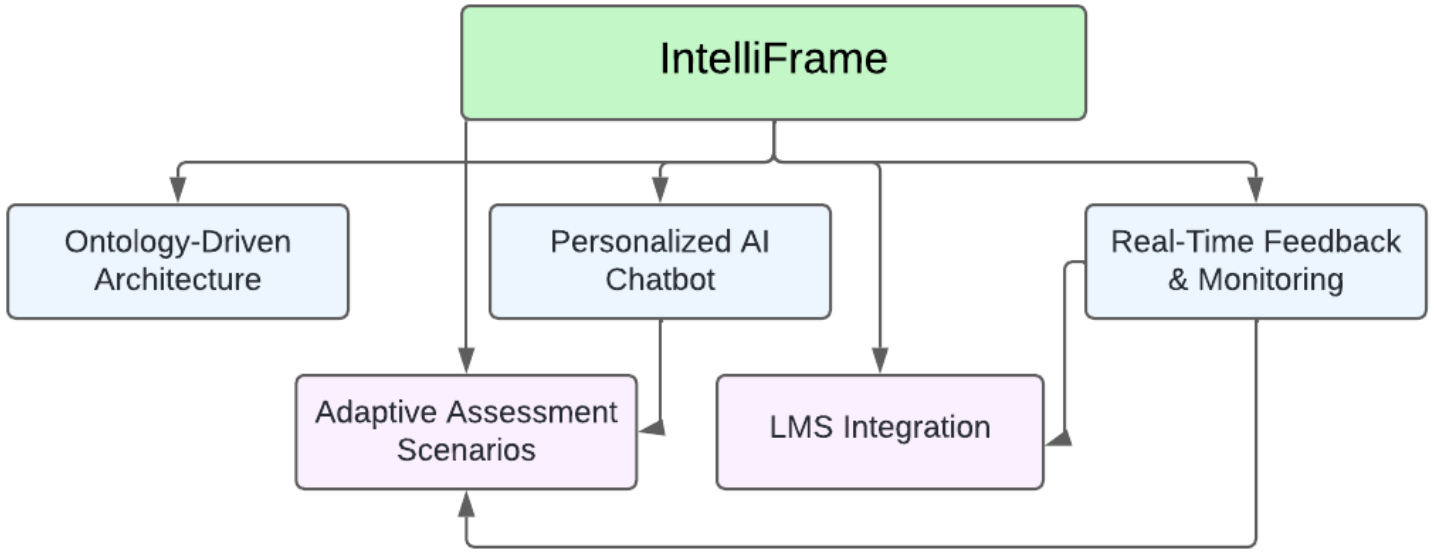
Need for a New Approach

IntelliFrame: A solution that integrates **ontology-driven evaluation and adaptive, real-time feedback**.

Addresses limitations by **assessing both the product and the process**, enabling a deeper understanding of student learning.

IntelliFrame Components

- IntelliFrame Framework
  - **Process and Product Evaluation:** Captures cognitive processes and creativity.
  - **Ontology-Driven Approach:** Maps student interactions with semantic technologies.
  - **Dynamic Adaptation:** Provides real-time feedback and personalized scenarios.



Personalized AI Chatbot Integration

IntelliFrame includes a domain-specific AI chatbot that provides tailored assistance directly to students.

- Unlike generic tools like ChatGPT, this chatbot is **context-aware and aligned with educational objectives**.
- Chatbot Capabilities:
- **Offers real-time feedback, hints**, and corrections based on the student's current progress.
- **Enhances engagement by providing meaningful, personalized interactions**.

Pilot Study and Key Assessment Scenarios

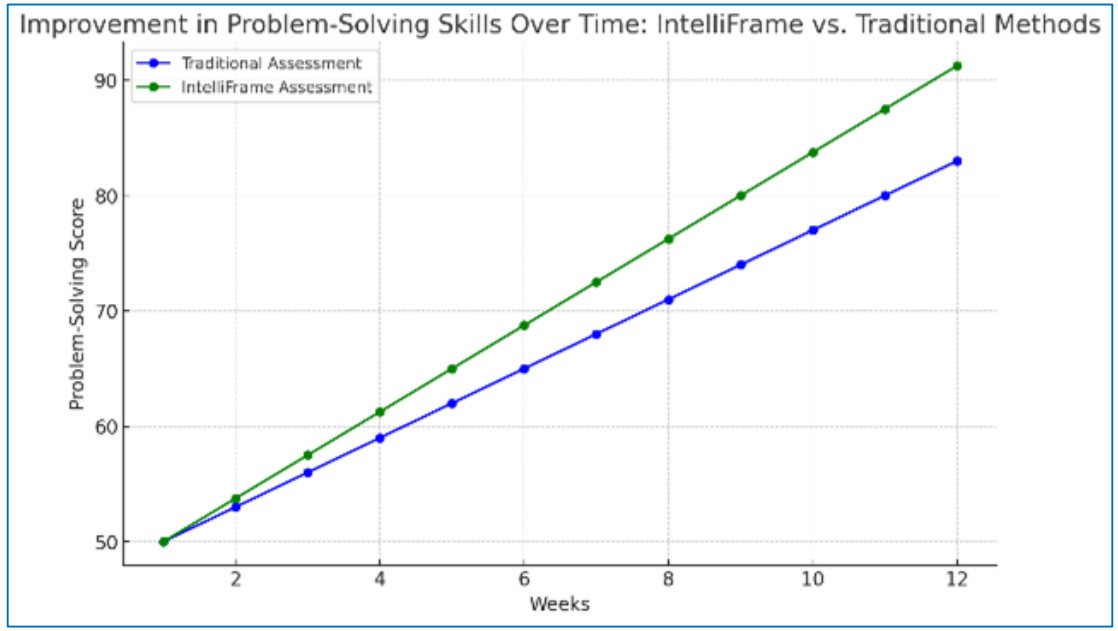
Pilot Study Setup:

- Conducted in a Python programming course with 250 first-year students.
- Two groups:
- **Experimental Group:** Utilized IntelliFrame for assessments.
- **Control Group:** Used traditional assessment methods.

Key Assessment Scenarios Implemented:

- **Adaptive Testing:** Questions adjusted in real-time based on student performance.
- **Personalized Feedback:** Instant, tailored feedback using AI-powered analysis.
- **Creative Assignments:** Encouraged innovative use of AI tools for problem-solving tasks.
- **Automated Grading:** Provided consistent evaluation, reducing manual grading efforts.

Results and Evaluation



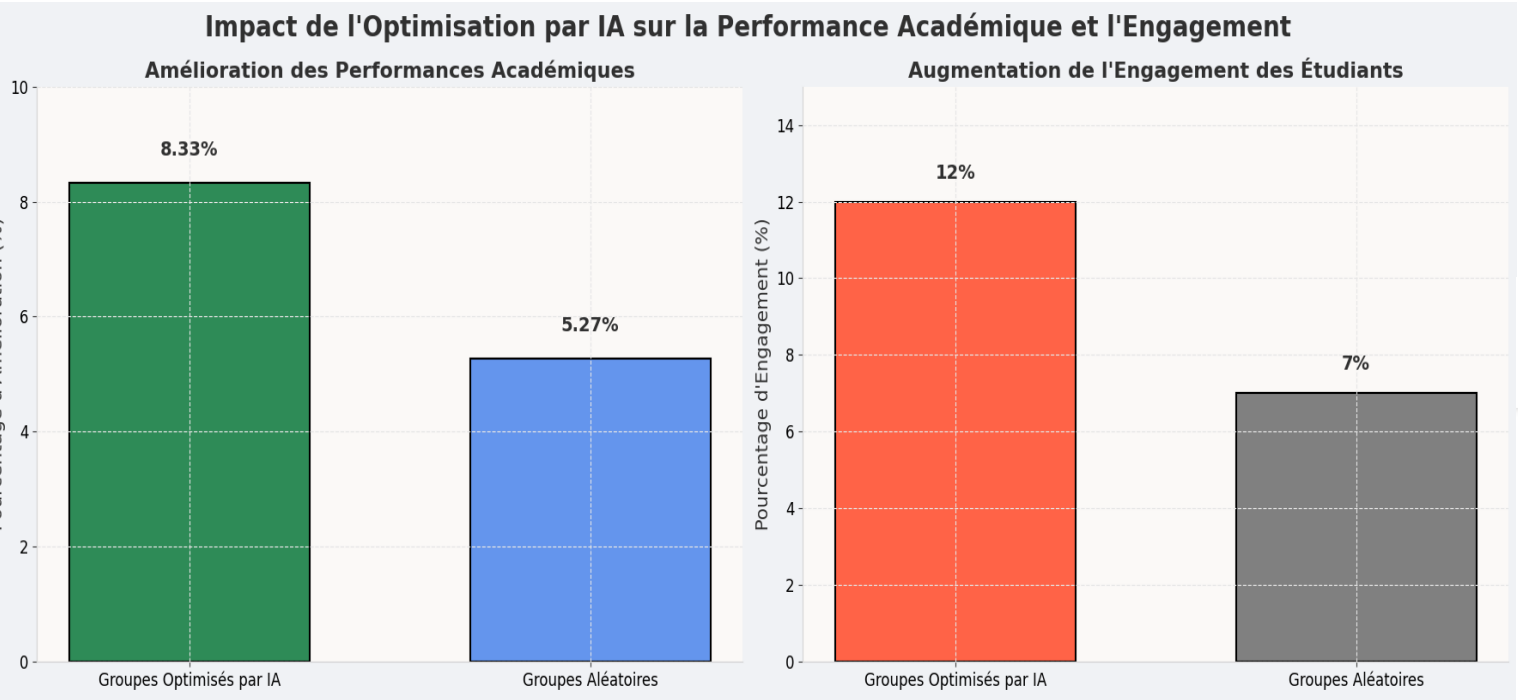
Key Findings:

- 30% **Increase in Grading Accuracy**: More precise evaluation of code quality and adherence to best practices.
- 25% **Improvement in Critical Thinking and Problem-Solving Skills**: Enhanced **iterative feedback** led to better decision-making.
- 35% **Increase in Student Engagement**: Higher participation rates due to dynamic task adjustments and real-time feedback.

Student Feedback:

- High satisfaction with personalized feedback and adaptive challenges.

Other Results



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Open Assessment Framework for Intelligent Peer Feedback in the Project-Based Collaborative Learning Environment

Original Research | Published: 26 July 2025

Volume 6, article number 687, (2025) Cite this article

SN Computer Science

Aims and scope →

Submit manuscript →

Asma Hadyaoui & Lilia Cheniti-Belcadhi

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JCAL Journal of Computer Assisted Learning

ORIGINAL ARTICLE

Exploring the effects of gender in skills acquisition in collaborative learning based on the ontological clustering model

Asma Hadyaoui, Lilia Cheniti-Belcadhi

First published: 23 July 2023 | https://doi.org/10.1111/jcal.12852

Results with 312 students for Intelligent Group Forming effects of Gender on skills acquisition

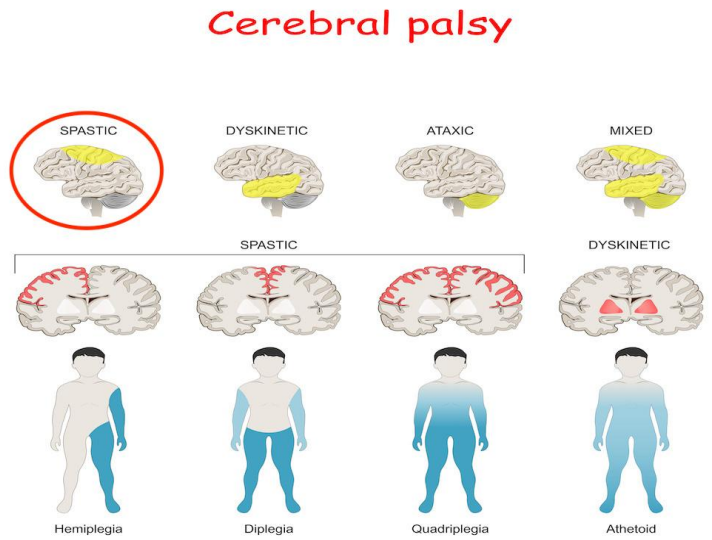
AI-Based Inclusive Assessment : Framework for Children with Cerebral Palsy

Cerebral Palsy

Cerebral palsy (CP) affects movement and coordination.

Early diagnosis

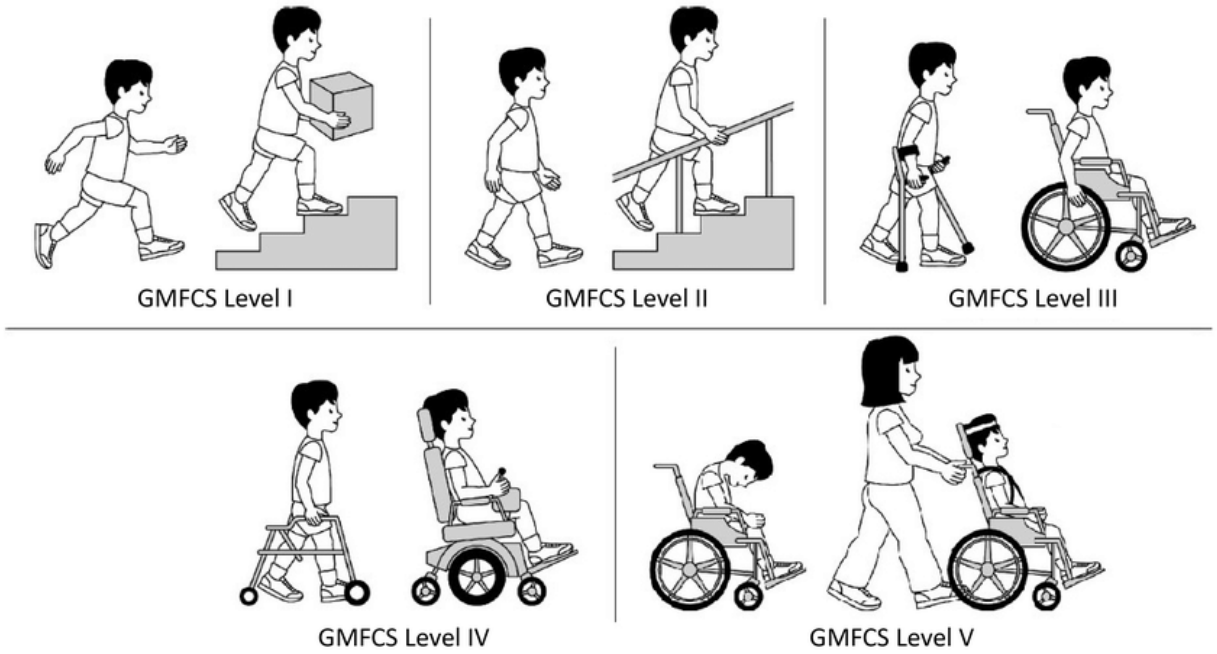
- Enables prompt interventions and rehabilitation.
- Optimizes resources and reduces costs.
- Improves long-term quality of life.



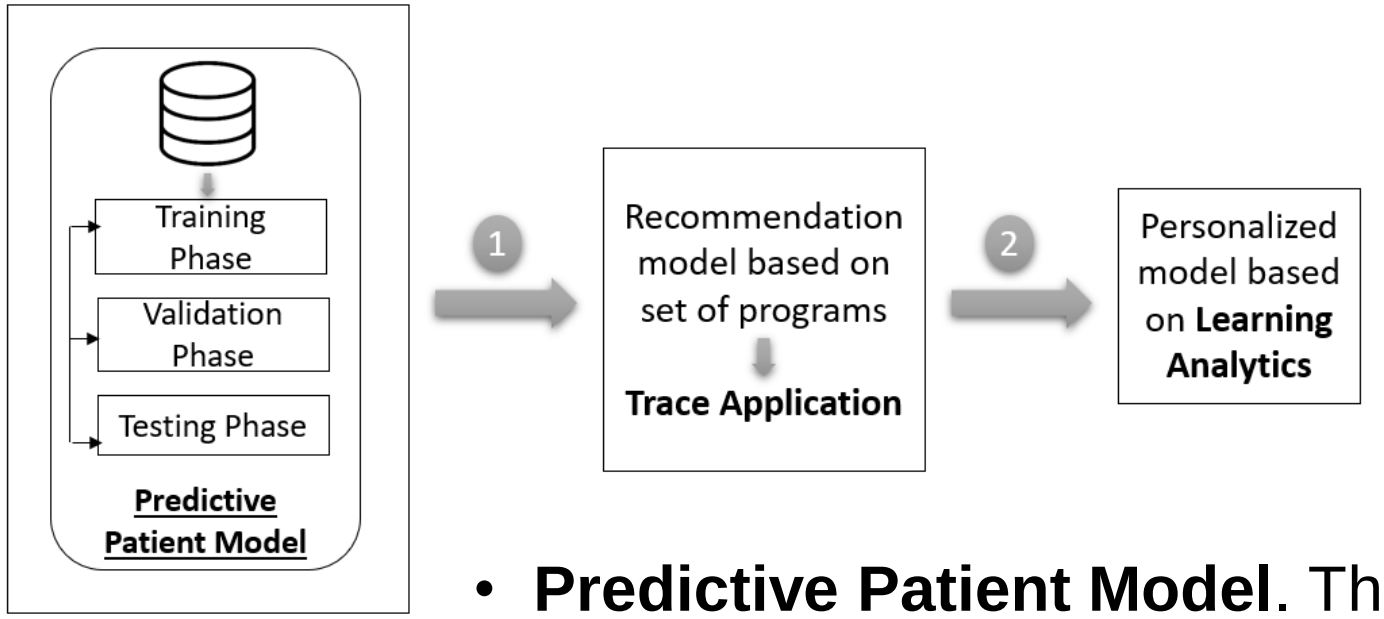
GMFCS

- GMFCS is an essential tool to evaluate severity, classify motor function, and guide personalized treatment plans.

- GMFCS enables targeted interventions, improves motor development, and enhances quality of life.



ALIF Framework



ELSEVIER
Procedia Computer Science
Volume 270, 2025, Pages 3618-3627

A Data-Driven Machine Learning Framework for Predicting Disabilities in Cerebral Palsy

Rahma Haouas Zahwanie [a], Lilia Cheniti-Belcadhi [a], Saoussen Layouni [b]

https://doi.org/10.1016/j.procs.2025.09.487

- **Predictive Patient Model**. This model predicts the GMFCS level of each patient based on their medical data.
- **Recommendation Model**, which uses the predictions to suggest suitable rehabilitation programs (videos).
- **Personalized Model** based on learning analytics, which continuously adapts treatment plans to each patient's progress

Challenges & Transformation for AI Based assessment and learning

Ethical Considerations in AI-Powered Education

Challenges	Measures
Bias and Fairness	Ensuring AI systems are designed and implemented to **avoid discriminatory practices and promote equity.** **Check for Bias and Accuracy**
Privacy and Data Security	Safeguarding student data and **respecting individual privacy** in the collection and use of educational information. **Protect Privacy**
Transparency and Accountability	Establishing clear guidelines and processes for the **responsible development and deployment of AI** in educational settings.
Human-AI Collaboration	Foster a **collaborative approach where AI assists and augments human instructional designers**, rather than replacing them entirely.

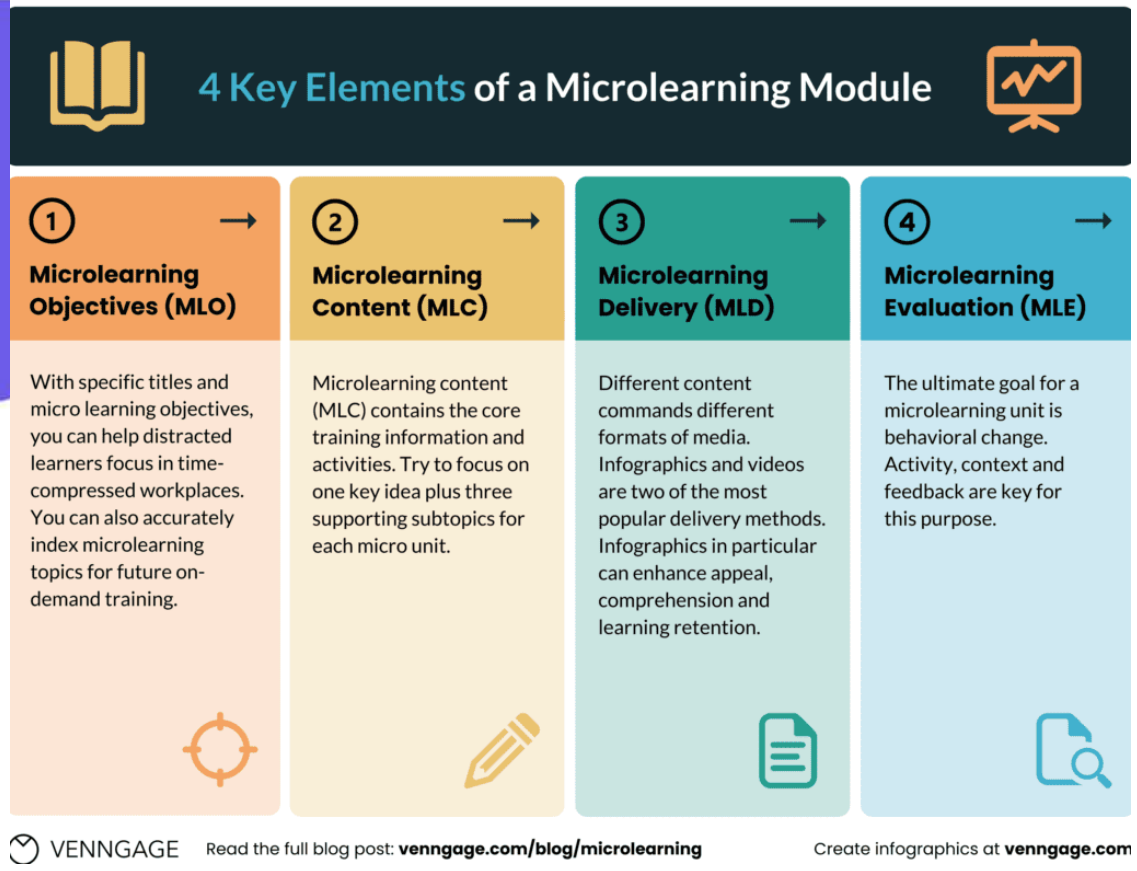
Shifting to a humanistic approach

Elevating the educational challenges

Teacher's role in the AI era

Fostering students' 21st-century skills

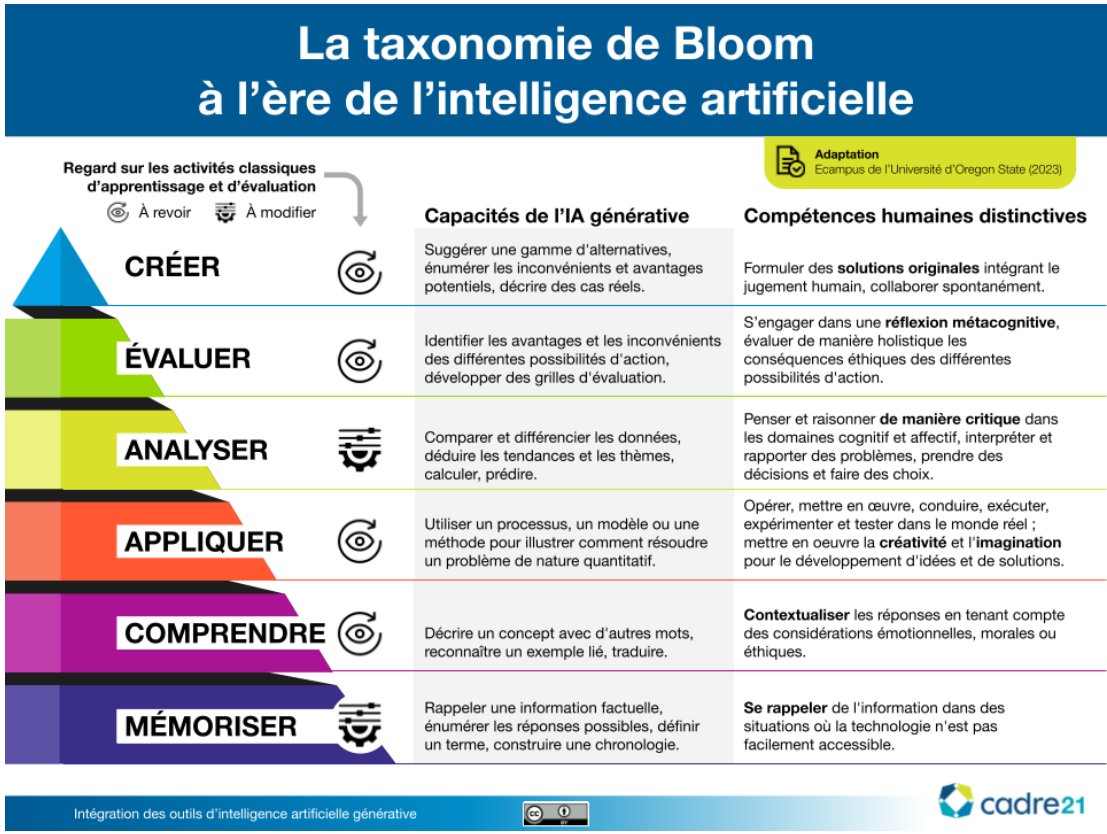
Leveraging AI opportunities



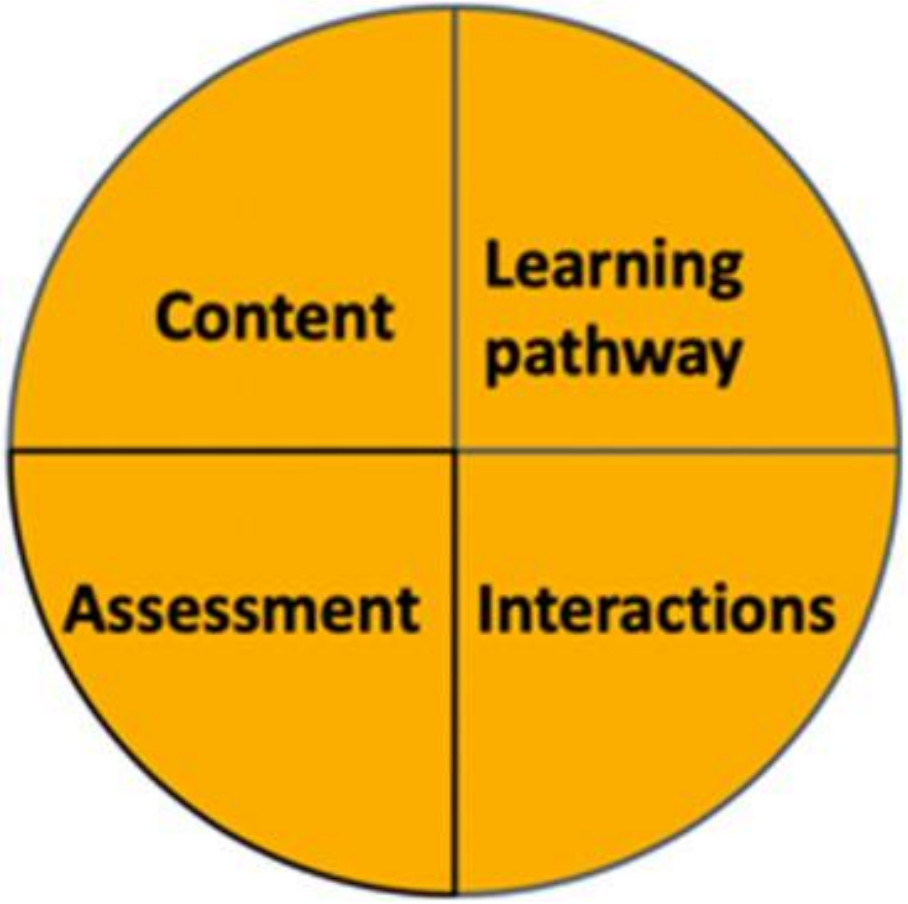
Teachers & Learners

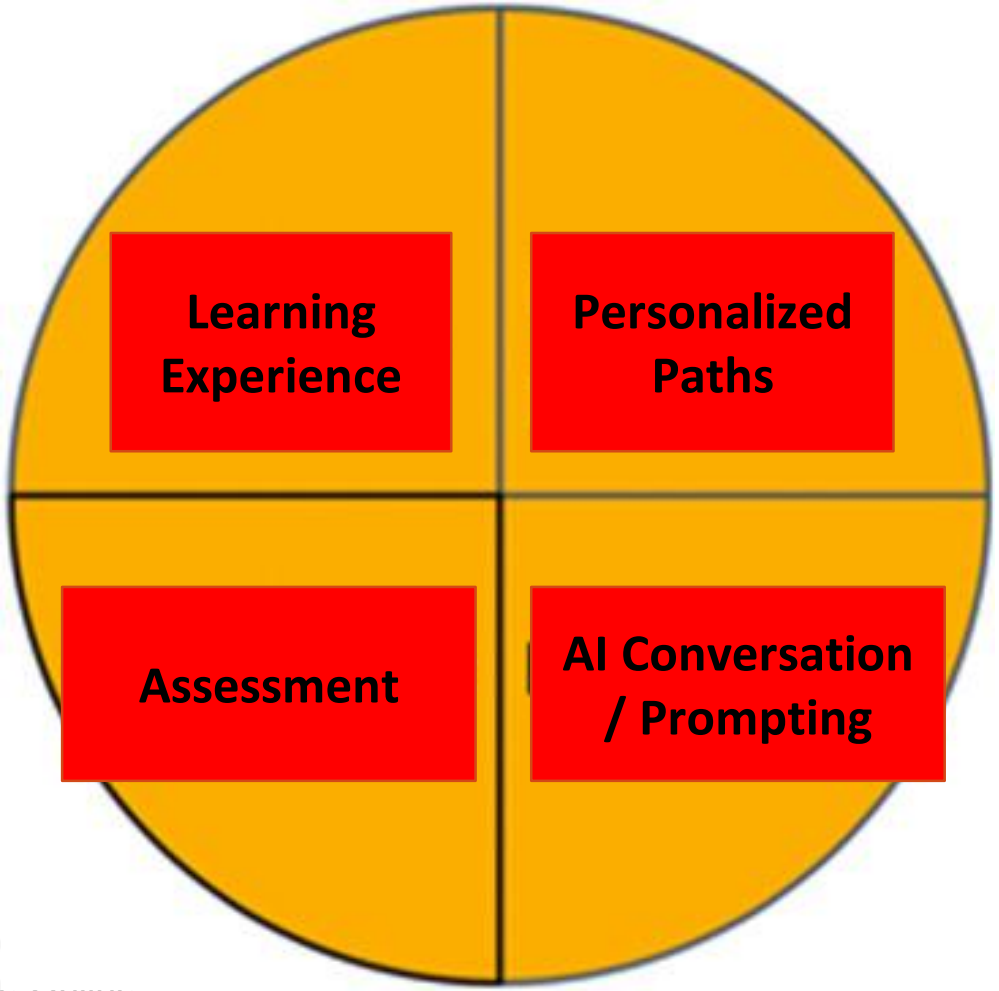
Fonctions	Plan cognitif	Plan Socio-affectif	Plan motivationnel	Plan métacognitif
Accueil et orientation	Informer sur le dispositif de formation	Initier la construction d'un sentiment d'appartenance	Faire émerger les objectifs personnels de l'apprenant	Inciter l'apprenant à faire le point sur ses stratégies cognitives
Organisation	Présenter les méthodologies appropriées	Réguler la dynamique de groupe	Accompagner le processus d'autonomie	Faciliter la planification de l'apprentissage
Pédagogie	Apporter des réponses ou les susciter. Remédier	Faciliter la collaboration des apprenants	Proposer des activités signifiantes	Susciter l'expression critique sur le dispositif
Socio-affectif Motivation	Personnaliser le soutien à l'apprentissage	Rompre l'isolement de l'apprenant	Lutter contre l'abandon	Faire prendre conscience de ses habiletés à collaborer
Technique	Aider à maitriser l'environnement d'apprentissage	Susciter l'entraide technique entre apprenants	Encourager l'utilisation des outils	Susciter la prise de distance réflexive sur les usages des outils
Métacognition	Faire conscientiser ses préférences cognitives	Faciliter la prise de conscience des états affectifs / tâches	Faire identifier les motivations intrinsèques	Inciter l'apprenant à apprendre à apprendre
Evaluation	Annoncer clairement les critères d'évaluation	Produire des rétroactions à portée formative	Encourager et féliciter	Aider à s'autoévaluer

En gris les interventions pouvant être confiées à un robot ayant été préalablement formé
En bleu, les interventions partagées par un robot et les tuteurs humains
En vert, les interventions ne pouvant être confiées qu'à des tuteurs humains



Transformation



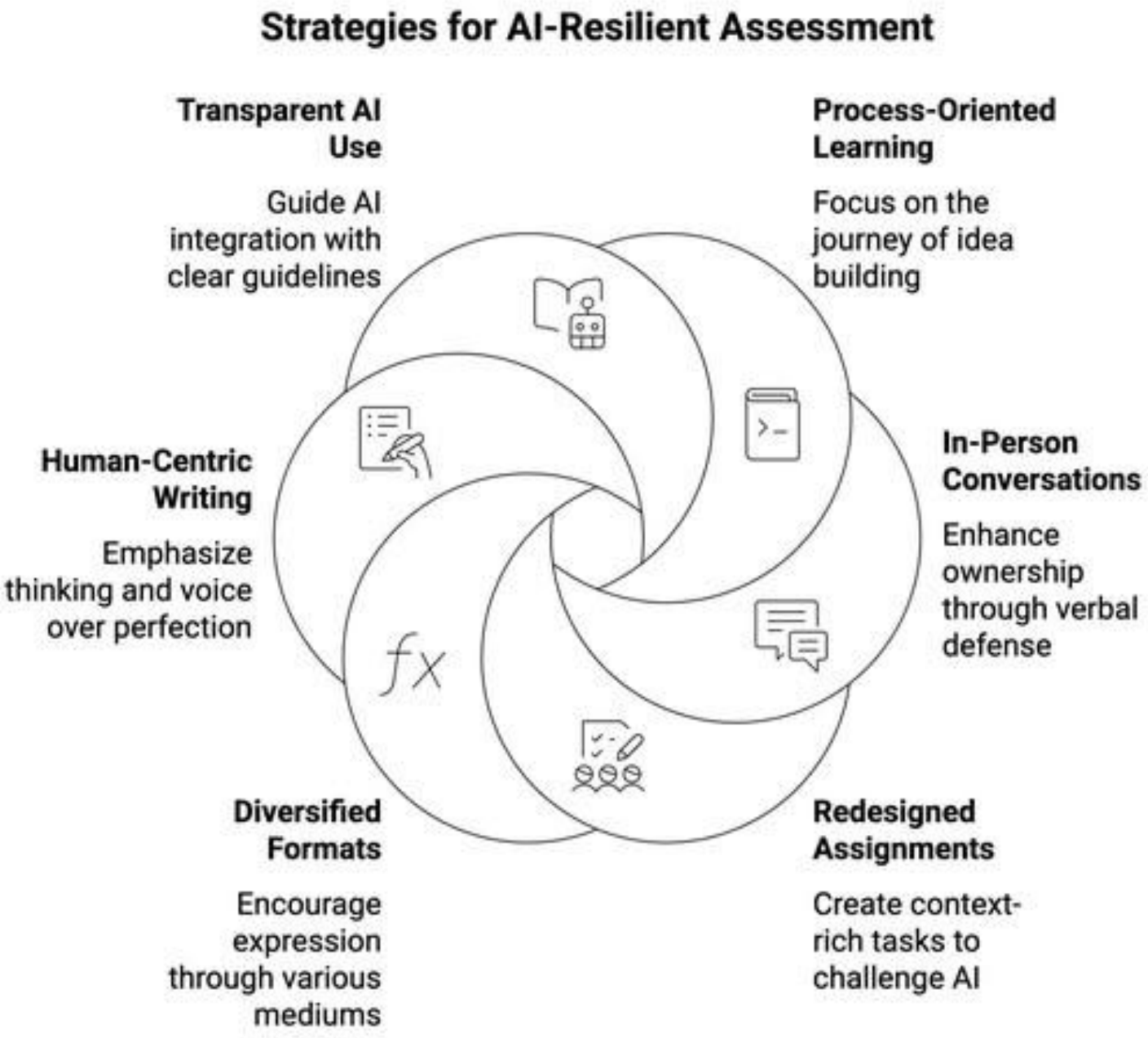


Jacqmot, C., DEVILLE, Y., & DOCQ, F. (2020). A
Framework to Understand, Analyse and Describe
and Open Education in Higher Education.

The AI Assessment Scale

1	**NO AI**	The assessment is completed entirely without AI assistance in a controlled environment, ensuring that students rely solely on their existing knowledge, understanding, and skills **You must not use AI at any point during the assessment. You must demonstrate your core skills and knowledge.**
2	**AI PLANNING**	AI may be used for pre-task activities such as brainstorming, outlining and initial research. This level focuses on the effective use of AI for planning, synthesis, and ideation, but assessments should emphasise the ability to develop and refine these ideas independently. **You may use AI for planning, idea development, and research. Your final submission should show how you have developed and refined these ideas.**
3	**AI COLLABORATION**	AI may be used to help complete the task, including idea generation, drafting, feedback, and refinement. Students should critically evaluate and modify the AI suggested outputs, demonstrating their understanding. **You may use AI to assist with specific tasks such as drafting text, refining and evaluating your work. You must critically evaluate and modify any AI-generated content you use.**
4	**FULL AI**	AI may be used to complete any elements of the task, with students directing AI to achieve the assessment goals. Assessments at this level may also require engagement with AI to achieve goals and solve problems. **You may use AI extensively throughout your work either as you wish, or as specifically directed in your assessment. Focus on directing AI to achieve your goals while demonstrating your critical thinking.**
5	**AI EXPLORATION**	AI is used creatively to enhance problem-solving, generate novel insights, or develop innovative solutions to solve problems. Students and educators co-design assessments to explore unique AI applications within the field of study. **You should use AI creatively to solve the task, potentially co-designing new approaches with your instructor.**

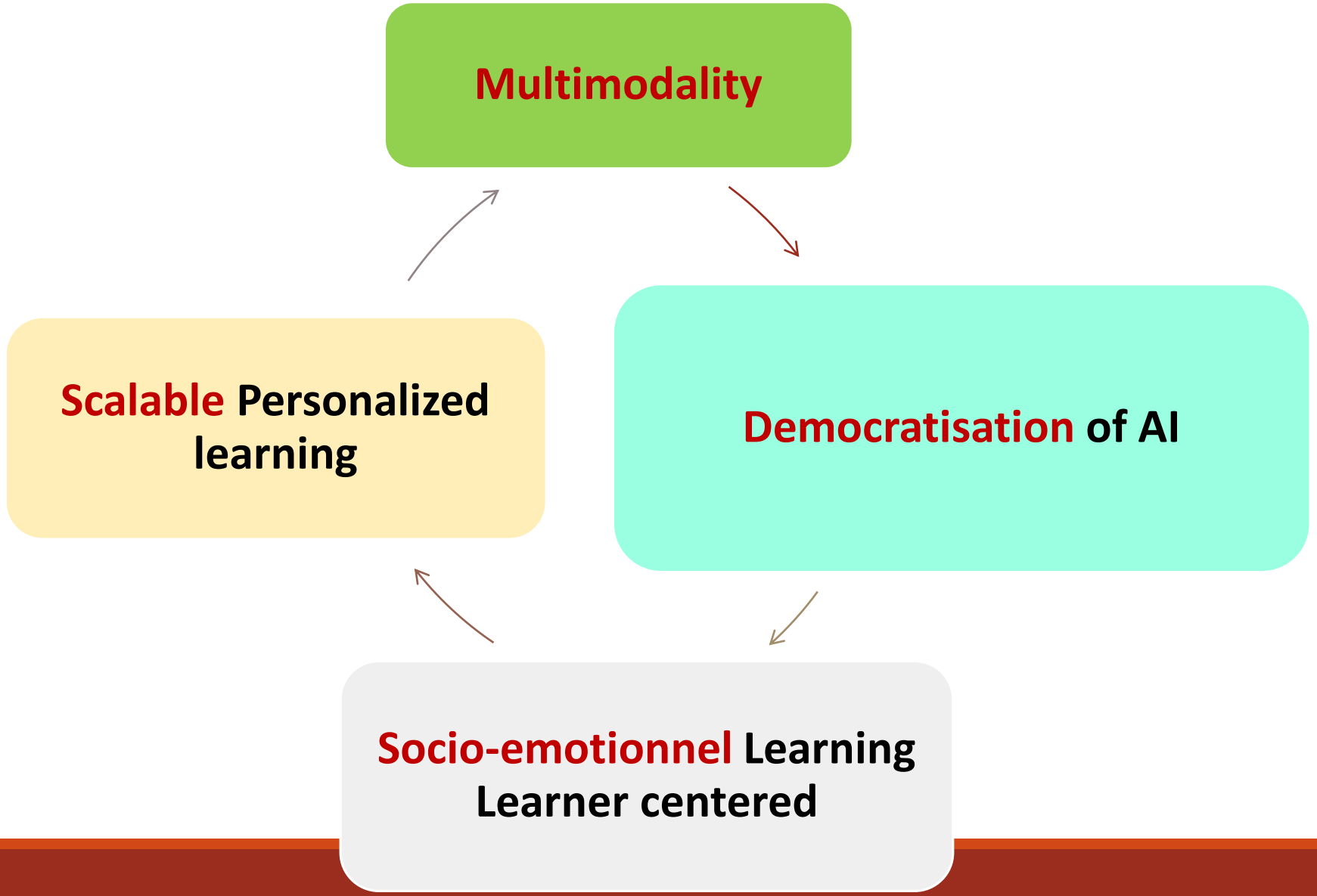
Perkins, Furze, Roe & MacVaugh (2024). The AI Assessment Scale



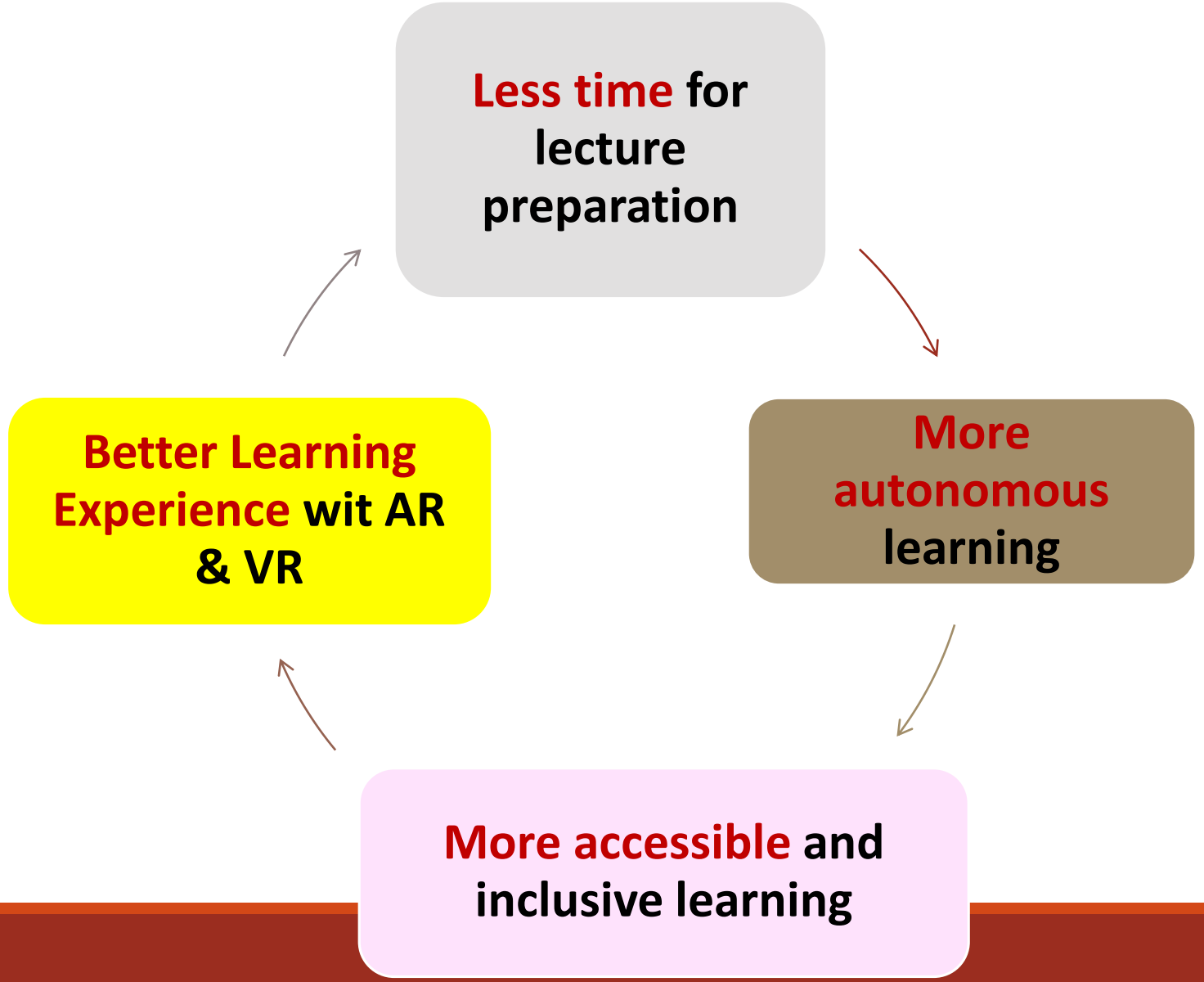
These strategies don't eliminate AI !

They simple help us ensure learning stays alive in the middle of it

Predictions for the future of AI in Education (1/2)

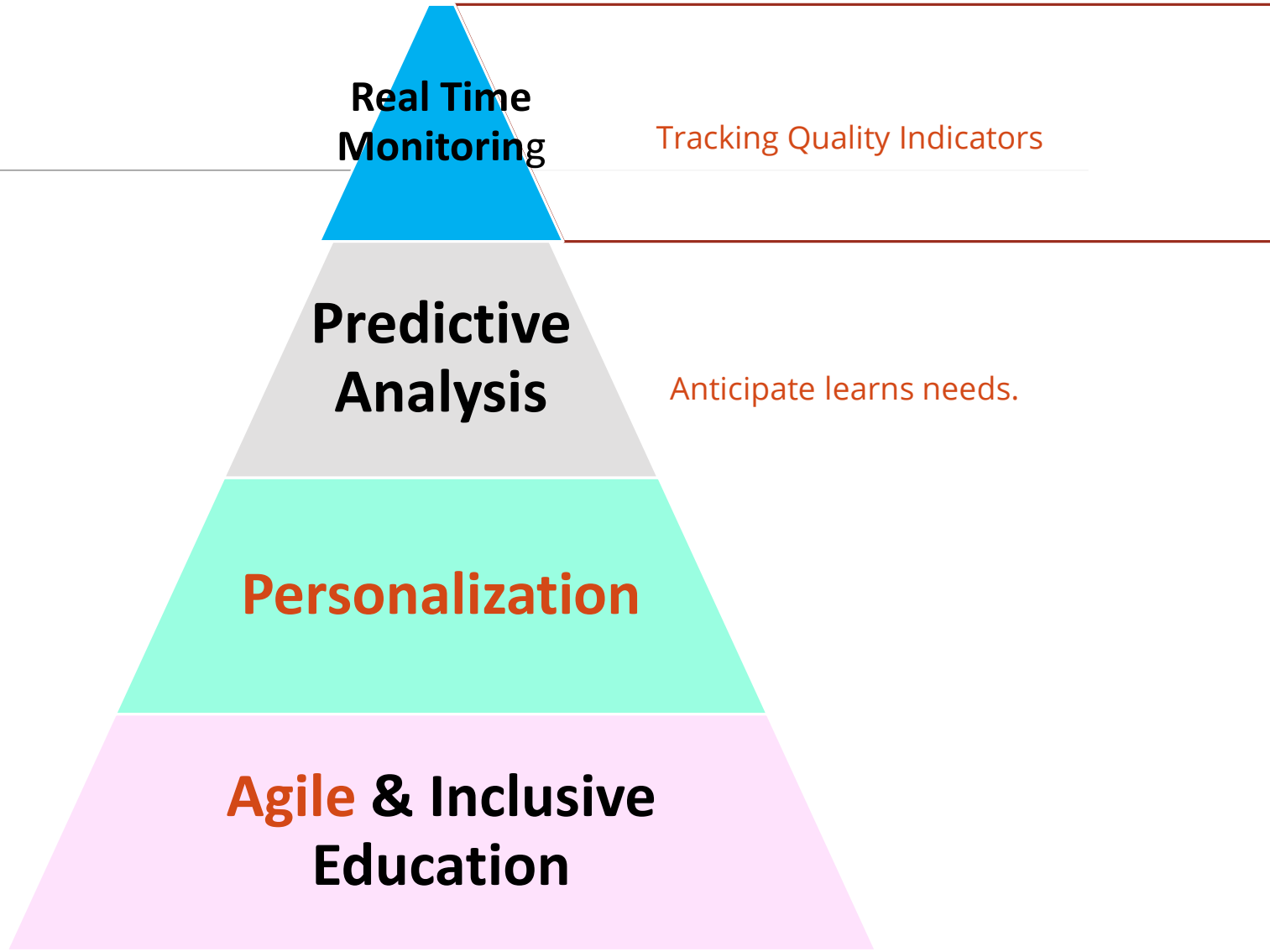


Predictions for the future of AI in Education (2/2)



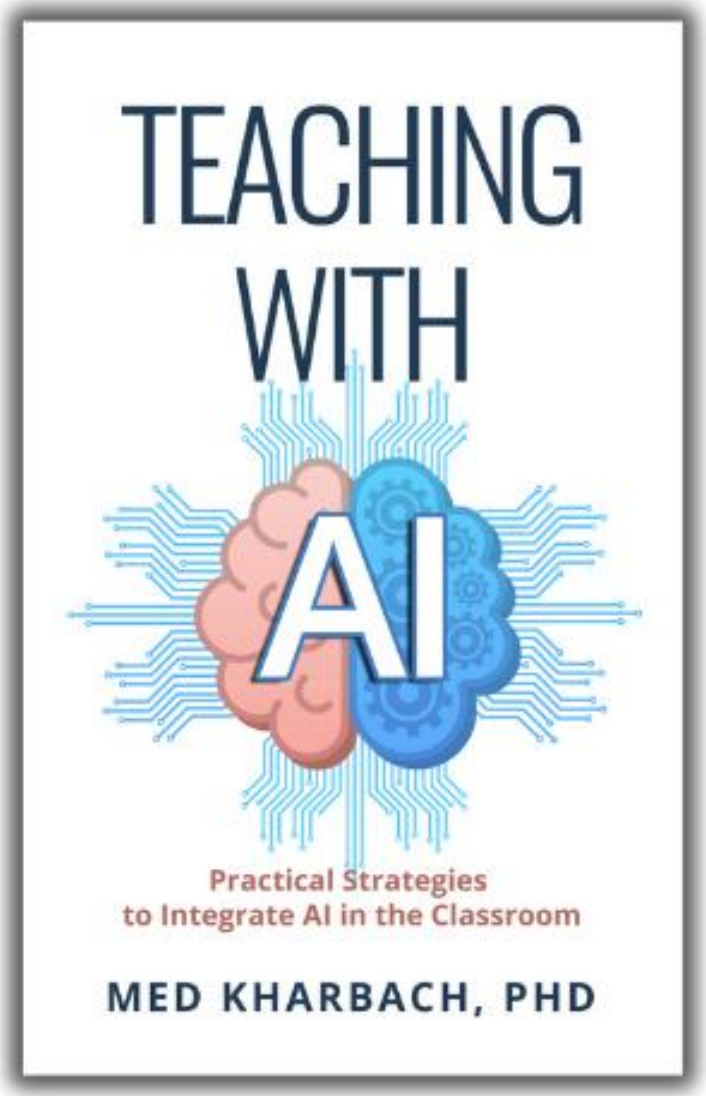
AI & Quality Assurrance

AI is transforming quality assurance into a proactive and personalized approach, paving the way for more responsive and student-centered education.



Learning paths Personalized wit automated feedbacks

More **flexible educational System**



AI Integration Frameworks in Education

SAMR Model

Evaluates technology integration in learning

Bloom's Revised Taxonomy

Classifies cognitive skills enhanced by AI

AI Integration Frameworks

TPACK Framework

Emphasizes technology, pedagogy, and content interplay

Depth of Knowledge (DOK)

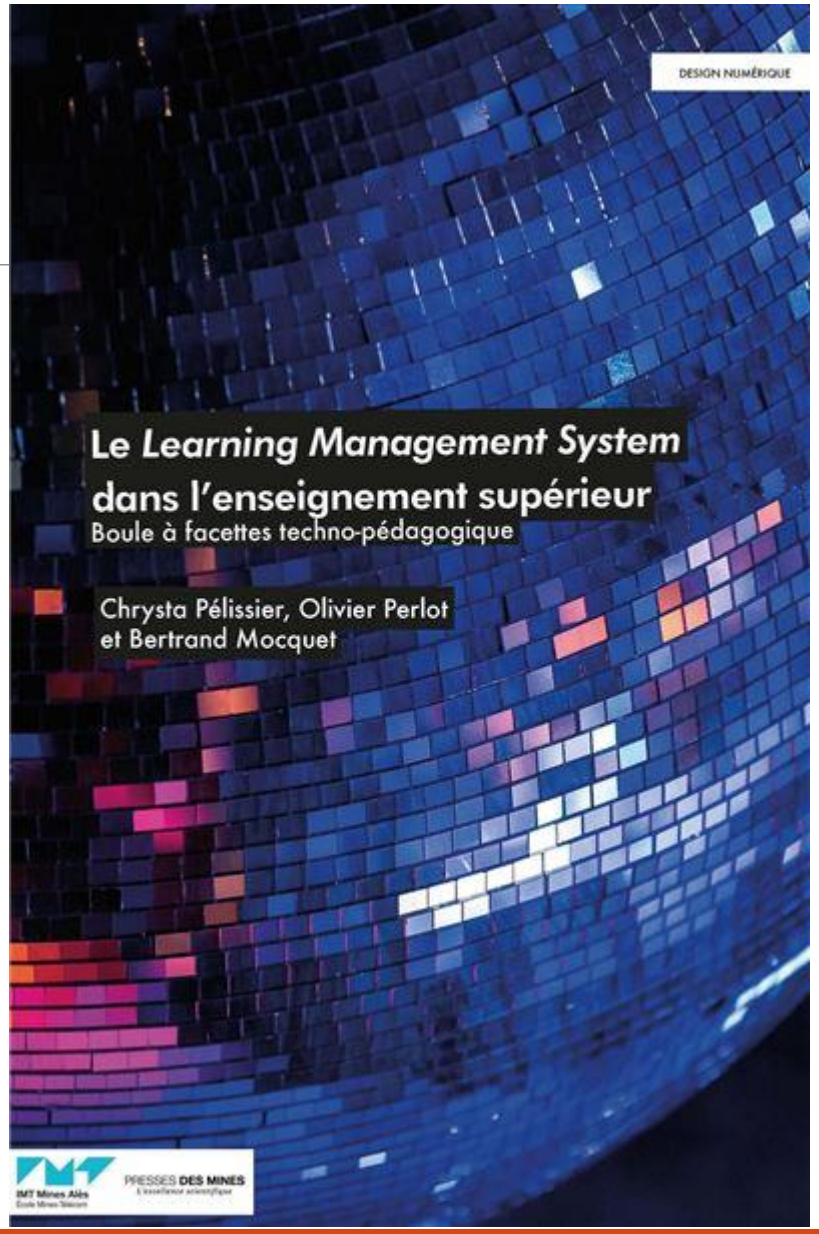
Assesses task complexity and understanding

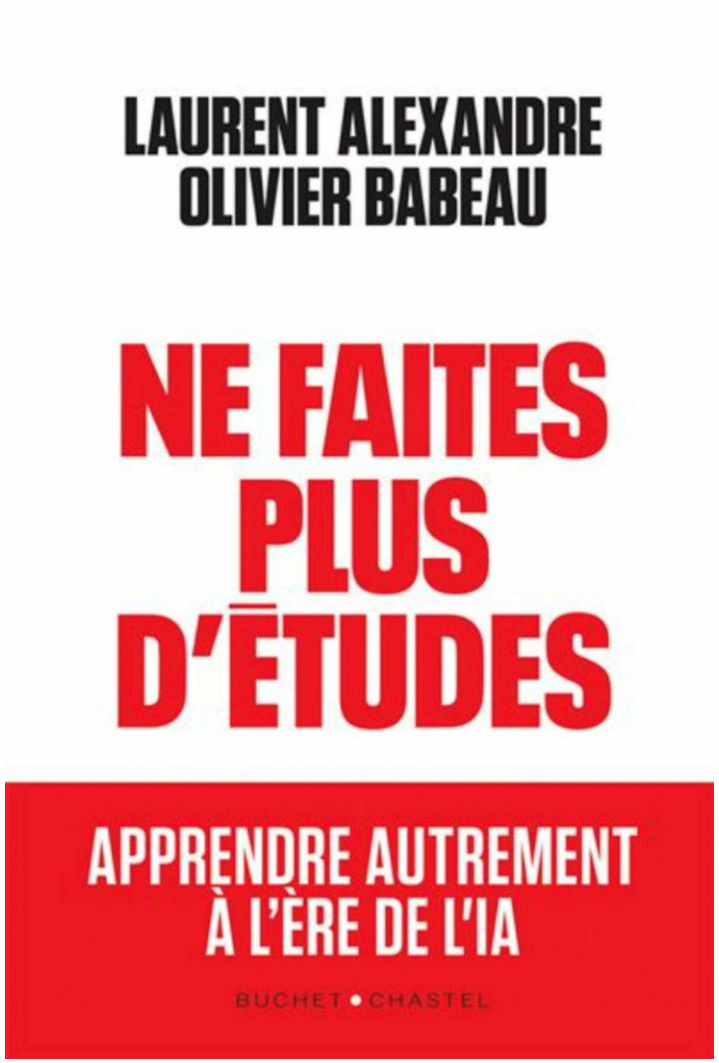
Recent publications

Cheniti-Belcadhi, L., Hadyaoui, A**. Février 2025 : Vers des environnements d'apprentissage intelligents, ouverts et innovants.** Dans Pélisser, C., Perlot, O. et Mocquet, B. Le Learning Management System dans l'enseignement supérieur : Boule à facettes technopédagogiques. Paris, Presses des Mines.

Hadyaoui, A**., Cheniti-Belcadhi, L.**, & Mitwally, M. A. (**2024**). **Cognitive AI's Transformative Impact on Self-Regulated Learning in eLearning Environments**. In Adarkwah, M. A., Amponsah, S., Schneider, K., Huang, R., & Thomas, M. (Eds.), Artificial Intelligence and Human Agency in Education: Perspectives on Cognitive, Social, and Psychological Contexts. Springer.

Cheniti-Belcadhi, L., Mitwally, M. A. A., & Hadyaoui, A. (**2025**). **Intelligent Frameworks for Assessment in AI-Enhanced Learning Environments**. In Artificial Intelligence Transforming Higher Education. Springer





- **Cognitive glaciation:** AI is gradually inducing a "slow cognitive glaciation": **the overtaking of the human brain by AI, once anticipated for 2100**, has just been pushed back to… **2031**

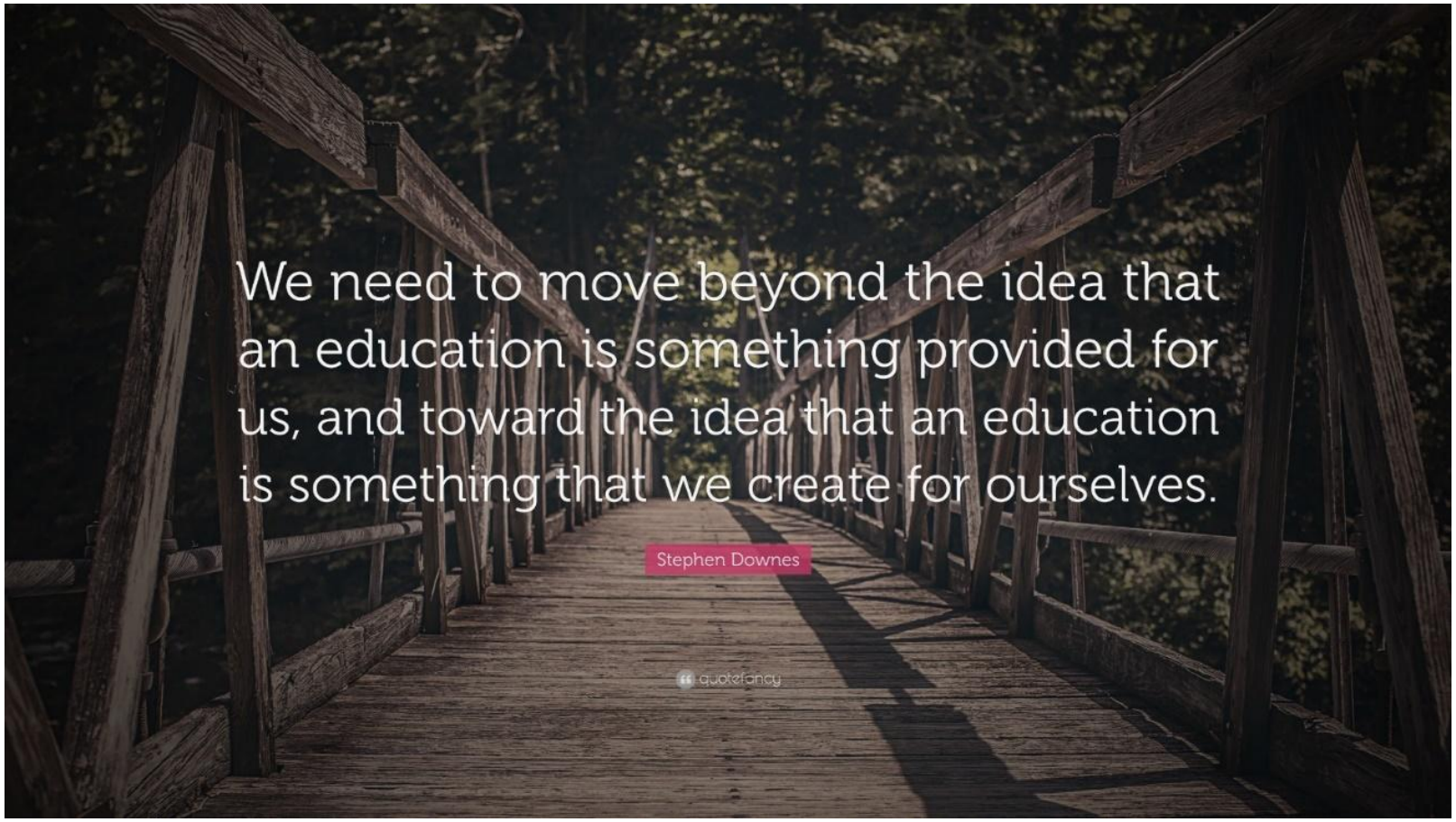
- **Impact on the job market: Robots replacing employees with certain skills**

- **Solution:**

- **Embrace AI :** Stop thinking in terms of "academic degrees," which quickly become obsolete, but in terms of "skills," which will need to be updated throughout life, keeping pace with technological advancements.

Ne faites plus d'études : apprendre autrement à l'ère de l'IA, de Laurent Alexandre et Olivier Babeau, éditions Buchet-Chastel. Sortie le 16 octobre 2025

AI isn’t replacing teachers, it’s redefining what great teaching can look like



Use of AI by teachers

Pedagogical practices and limitations

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