

AI and understanding learning

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Overview

- European Commission White paper on AI
- Key messages on AI and Education (draft)
- AI in Education – systematic review
- Assessment of LOs – TALOE
- AI and assessment – UStanford
- Chinese Experience on AI and emotions in learning
- Personal Remarks

WHITE PAPER On Artificial Intelligence - A European approach to excellence and trust

19 February 2020

Seizing The Opportunities Ahead: The Next Data Wave

- ✓ Action 1: The Commission, taking into account the results of the public consultation on the White Paper, will propose to the Member States a revision of the Coordinated Plan to be adopted by end 2020
- ✓ Action 2: the Commission will facilitate the creation of excellence and testing centres that can combine European, national and private investments, possibly including a new legal instrument.

WHITE PAPER On Artificial Intelligence - A European approach to excellence and trust (cont.)

- ✓ Action 3: Establish and support through the advanced skills pillar of the Digital Europe Programme networks of leading universities and higher education institutes to attract the best professors and scientists and offer world-leading masters programmes in AI.
- ✓ Action 4: the Commission will work with Member States to ensure that at least one digital innovation hub per Member State has a high degree of specialisation on AI. Digital Innovation Hubs can be supported under the Digital Europe Programme.
- ✓ Action 5: In the context of Horizon Europe, the Commission will set up a new public private partnership in AI, data and robotics to combine efforts, ensure coordination of research and innovation in AI, collaborate with other public-private partnerships in Horizon Europe and work together with the testing facilities and the Digital Innovation Hubs mentioned above.

WHITE PAPER On Artificial Intelligence - A European approach to excellence and trust (cont.)

- ✓ Action 6: The Commission will initiate open and transparent sector dialogues giving priority to healthcare, rural administrations and public service operators in order to present an action plan to facilitate development, experimentation and adoption.
- ✓ Risks for fundamental rights, including personal data and privacy protection and non-discrimination
- ✓ Risks for safety and the effective functioning of the liability regime
- ✓ Scope of a Future EU Regulatory Framework

Key messages on AI and Education (draft)

- ✓ June 2019
- ✓ Definition of AI
- ✓ Education for AI and AI for Education
- ✓ AI for society
- ✓ AI for teachers
- ✓ Educationg about AI
- ✓ AI in a LLL perspective
- ✓ AI solution to solve real needs
- ✓ Ethical use of AI in education are central

Key messages on AI and Education (draft) (cont.)

Challenges

- ✓ AI can easily scale up and automate "bad pedagogical practices"
- ✓ AI may generate stereotyped models of students' profiles and behaviours & automatic grading
- ✓ Need for big data on student learning (privacy, security & ownership of data are crucial)
- ✓ Skills for AI & implications of AI for new skills requirements
- ✓ Need for policy makers to understand the basics of ethical AI

Key messages on AI and Education (draft) (cont.)

Policy Issues

- ✓ AI for education is a spill over from other areas, not purpose-built for education.
- ✓ Experts tend to be concentrated in the private sector and may not be sufficiently aware of the requirements in the education sector.
- ✓ Ethical and privacy issues
- ✓ Lack of research and good practice around using AI in Education

Systematic review of research on artificial intelligence applications in higher education—where are the educators?

- 2656 identified publications and 146 selected (2007 until 2018)
- Profiling and prediction
- Assessment and evaluation
- Adaptive systems and personalisation
- Intelligent tutoring systems
- ✓ Conclusion 1: Lack of critical reflection on risks and challenges
- ✓ Conclusion 2: Weak connection to pedagogical theories
- ✓ Conclusion 3: Exploration of ethical and educational approaches

The future of assessment: five principles, five targets for 2025 - JIISC

- ✓ Authentic (Peer and self, immersive)
- ✓ Accessible (technology)
- ✓ Appropriately automated (feedback and adaptative)
- ✓ Continuous (learning analytics, digital qualifications, AI)
- ✓ Secure (data forensics and online invigilation)

TALOE – Time to Assess Learning Outcomes in Education



*What do we
hope students will learn?*

*How do we know that
they have learned?*

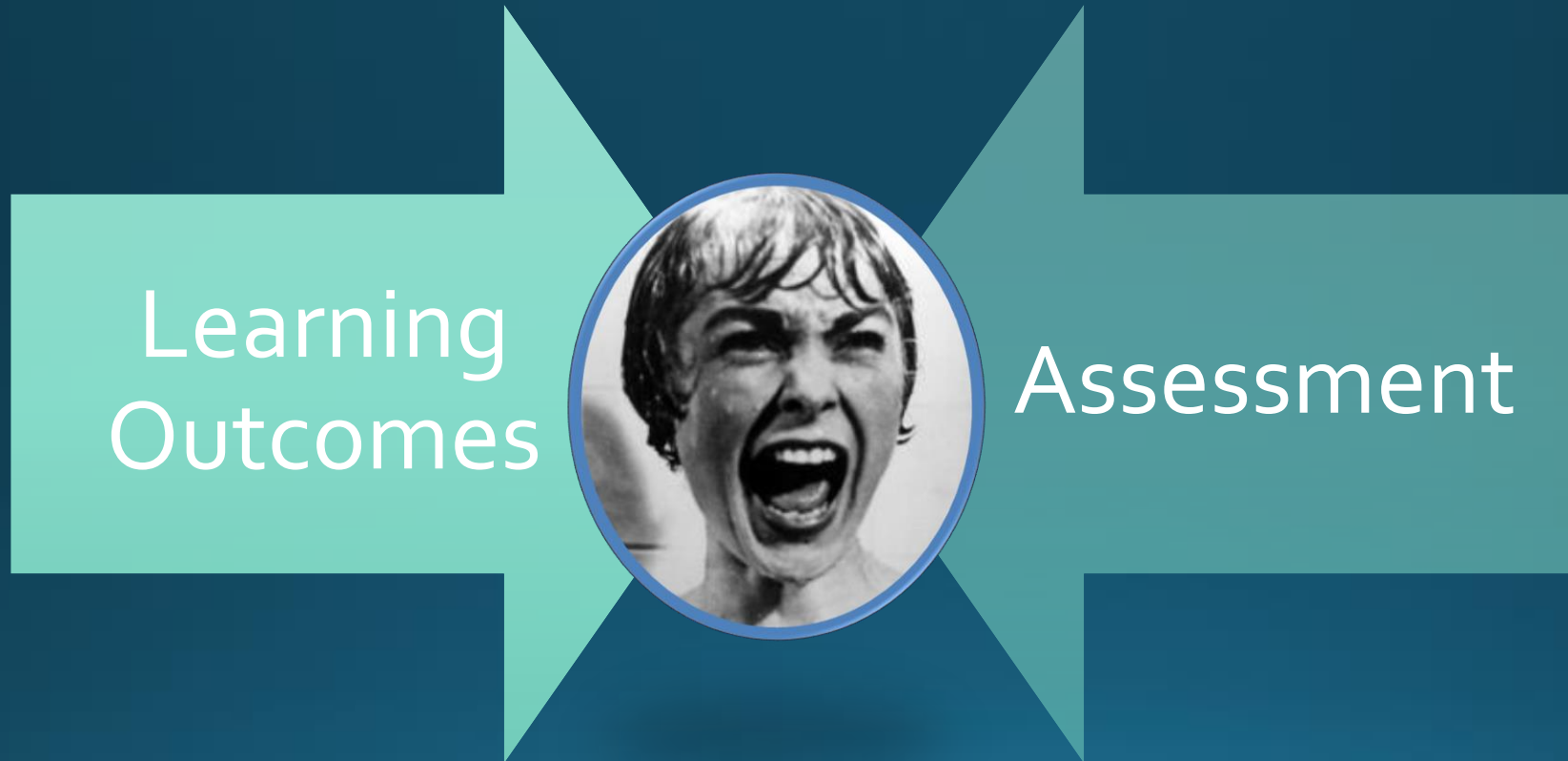
Why?...

- Qualification - **skills and competences** (new?)
- Mobility and **recognition**
- **Quality** approach and accreditation


THE FOCUS IS ON THE
STUDENTS!



Simple problem...?



The first step is to describe your Learning Outcome



[About TALOE Webtool](#) [Ask for Assessment Advice](#) [Writing Learning Outcomes](#) [Assessment Methods](#) [Case Studies](#) [Help](#)

Ask for Assessment Advice

Step 1: Choose the learning outcome you want your students to achieve. You can write the learning outcome in the box below.

Insert the description of Learning Outcome here

Step 2: Please select from one or more of the tabs below the verb or the verbs (maximum 3) that better describes the Learning Outcome:

Remember	Understand	Apply	Analyze	Evaluate	Create
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☐ Recognizing – Locating knowledge in long-term memory that is consistent with presented material

☐ Recalling – Retrieving relevant knowledge from long-term memory

[Check assessment methods](#)

AI and Assessment (U. Stanford)

Teaching Commons

- In AI assessment, a software system infers problem-specific rules for automated scoring from examples of instructor grading of student assignments.
- Initially, AI techniques are applied to learn how an instructor grades a problem. The instructor evaluates a sample set of student responses.
- The system creates a computer model incorporating rules it inferred about the instructor's grading decisions.
- Such techniques are applied to student work in a number of disciplines, for example, to mathematical problem-solving, to programming in computer science, and increasingly to essays.

AI and Assessment (U. Stanford)

Teaching Commons

- The strengths of AI assessment are efficiency, consistency in applying the same criteria across students, and immediate and detailed feedback on performance.
- AI assessment is most useful as one part of an assessment process and for enhancing learning, rather than making final, authoritative, high-stakes decisions about student performance.
- Key considerations are sufficient transparency of the rules applied, human scoring establishing the validity of machine-generated scores, and ongoing quality control.

Understanding learning – student's emotions

- ✓ Schools in China using method since 2017.
- ✓ Using technology to monitor students' facial expressions, letting teachers know what emotions learners are experiencing.
- ✓ "Smart Classroom Behaviour Management System".
- ✓ Scanning learners every 30 seconds and determining if they're happy, confused, angry, surprised, fearful, or disgusted.

Understanding learning – student's emotions

(cont.)

- ✓ Log six types of behaviors: reading, writing, hand raising, standing up, listening to teacher and leaning.
- ✓ If attention level falls below a certain point it is recorded.
- ✓ Can be used as a teaching aid.
- ✓ Quote "it is like there are a pair of mystery eyes constantly watching me, and I don't dare let my mind wander."
- ✓ Monitor performance of teachers and help improve teaching techniques.

Personal remarks

- AI is promising in education;
- Challenges have to be addressed by research and debate;
- Assessment seems a promising area;
- Understanding reactions from learners can help avoiding failures;
- Decisions and rules have to be led by humans;
- EDEN next conference (Timisoara, 20Jun20) seems adequate for open debate – Get involved!