AI in Research in Education

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Introduction

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AI solutions belong to EdTech category

EdTech = education technology

should be technology for education, not vice versa to be of interest to research in education

its mission is to enhance/ support learning, teaching and assessment

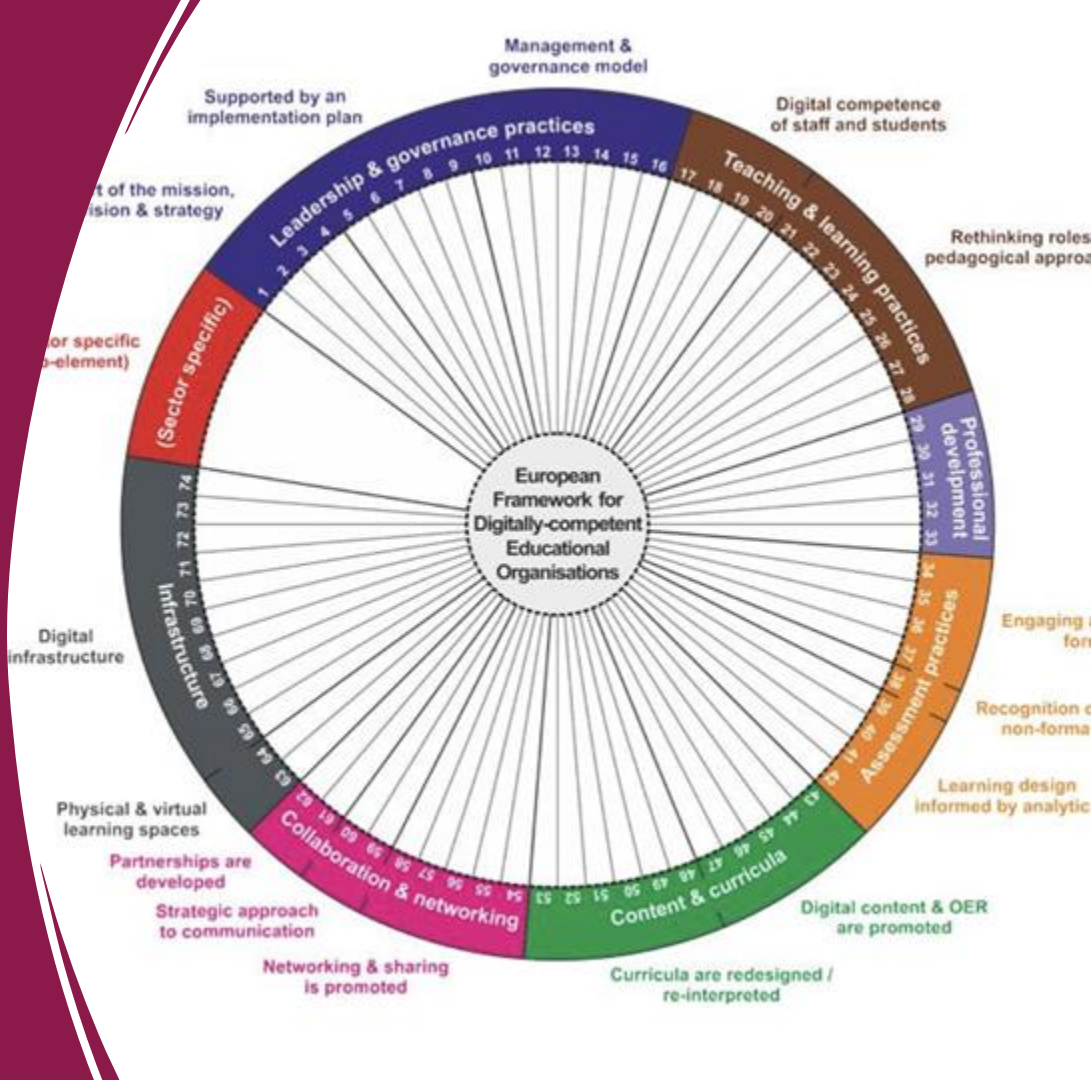
We do not have proof now how AI could be enhancing / supporting learning and teaching

We hear lots about the potential, transformation… but

AI is in education for a long long time, as a part of EdTech…

The right way of EdTech (incl. AI) to Education

DigCompOrg



FUNDAMENTALS

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1. AI as EdTech
2. The perspective of digital competences
3. How does the EU address the challenges of digital education?

Legacy of technology application in education stands on the shoulders of giants for decades

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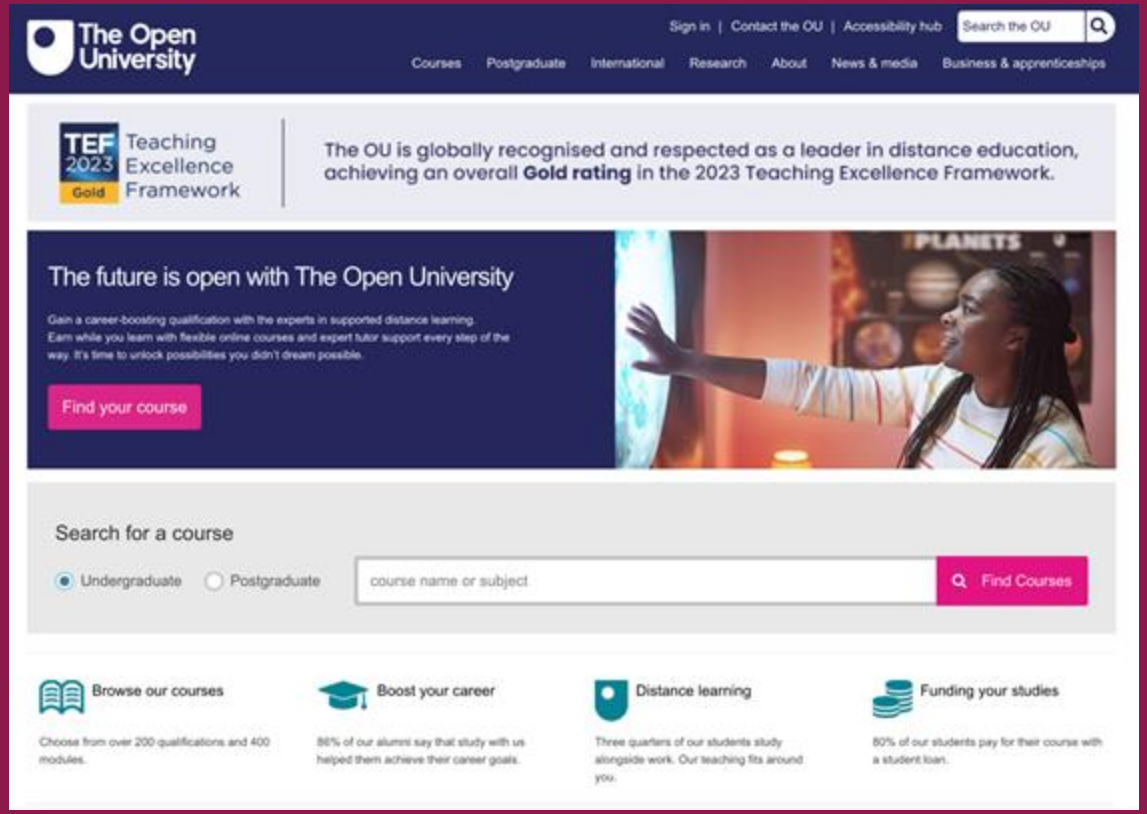
https://www.open.ac.uk/



EdTech

a short form of educational technology, referring to digital and other connected technologies used to conduct or support education.

EdTech should be understood as covering a wide range of technologies - digital, interactive, broadcasting, synchronous and asynchronous - that are deployed in attempts to maintain educational continuity through an unprecedented disruption. Some definitions include radio and television, but most often internet - connected technologies (beyond specific hardware and software products) are concerned.

Mark West, 2023. “An ed-tech tragedy?”, UNESCO publication

https://unesdoc.unesco.org/ark:/48223/pf0000386701

Research in EDU vs IT on EdTech

Research in EDU vs IT

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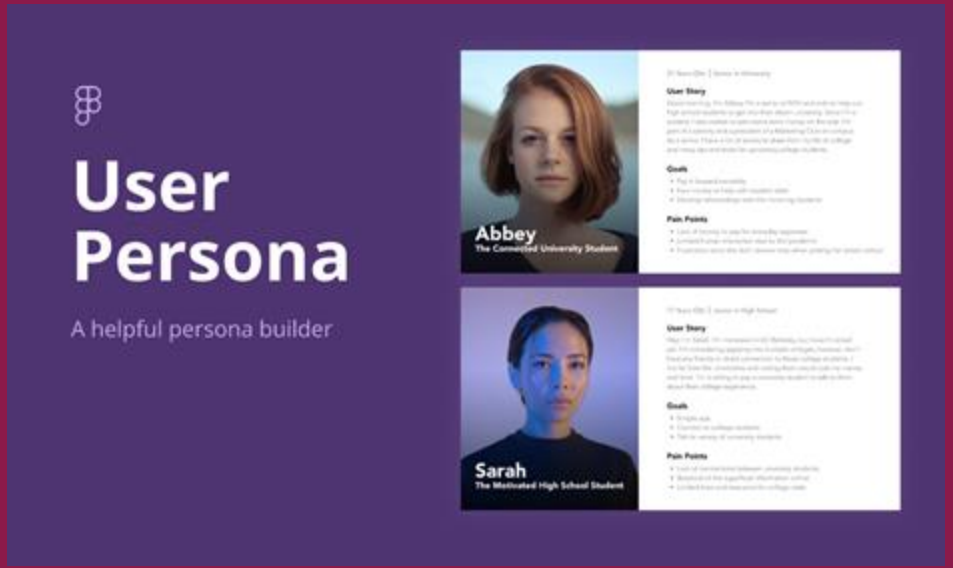
learning problem argument (EDU)

persona development (IT)

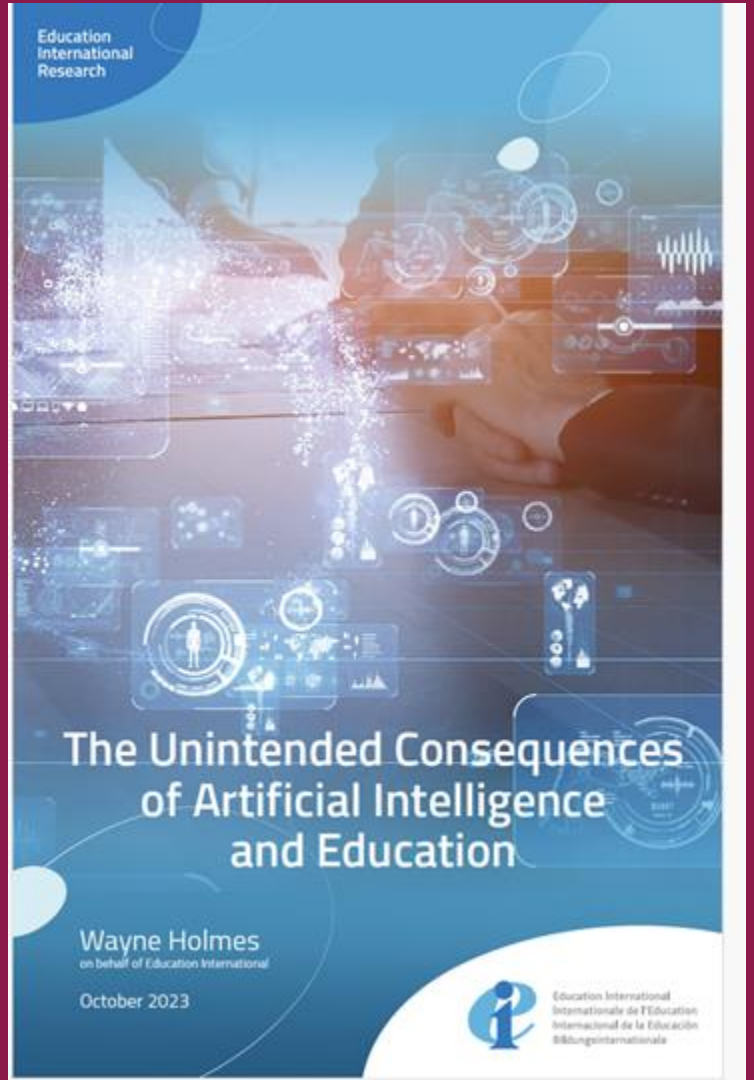


https://www.aupress.ca/books/120290-25-years-of-ed-tech

2016

The Return of Artificial Intelligence

Artificial intelligence (AI) is an interesting case study in ed tech, combining several themes that have already arisen in this book: promise versus reality, the cyclical nature of ed tech, and the increasingly thorny ethical issues raised by its application. The possibilities of AI in education saw an early burst of enthusiasm in the 1980s, particularly with the concept of Intelligent Tutoring Systems (ITS). This initial enthusiasm waned somewhat in the 1990s. This was mainly because ITS only worked for very limited, tightly specified domains. Developers needed to predict the types of errors people would make in order to provide advice on how to rectify these. And in many subjects (the humanities in particular), it transpired that people could be very creative in the errors they made, and more significantly, what constituted the right answer was less well defined. For example, in their influential paper, Anderson, Boyle, and Reiser (1985) detailed intelligent tutoring systems for geometry and the programming language LISP (derived from "list processor"). They confidently predicted that "cognitive psychology, artificial intelligence, and computer technology have advanced to the point where it is feasible to build computer systems that are as effective as intelligent human tutors" (p. 456).



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So, what exactly is AI? AI is a field of computer science that emerged from the field of cybernetics (the study of control and communication in living organisms and machines) and that seeks to develop intelligent machines. This is usually taken to mean machines that are capable of performing tasks that would typically require human intelligence. AI was named by the computer scientist John McCarthy at a workshop held in 1956 at Dartmouth College (a US Ivy League research university). However, since then, AI has been defined in multiple ways, often by and for computer scientists in ways that are challenging for non-experts to understand. A simple definition for non-experts is provided by the online Oxford English Dictionary:

> *The capacity of computers or other machines to exhibit or simulate intelligent behaviour.*

This definition is helpful because it does not depend entirely on data (Holmes & Porayska-Pomsta, 2023). While it does accommodate the data-driven AI techniques that have led to the dramatic recent developments, it can also include symbolic AI (an earlier knowledge-based approach that is still used in many AI applications in education) and any new paradigm of AI that might emerge in future years. However, it does not reference the role of humans, which is important given the critical role of humans at all stages of the AI development pipeline (including setting the objectives, collating and cleaning the data, choosing the algorithms, evaluating the outputs, aligning with human values, and so on). Finally, while it does distinguish by omission

As the University of Oxford Associate Professor Carissa Véliz writes:

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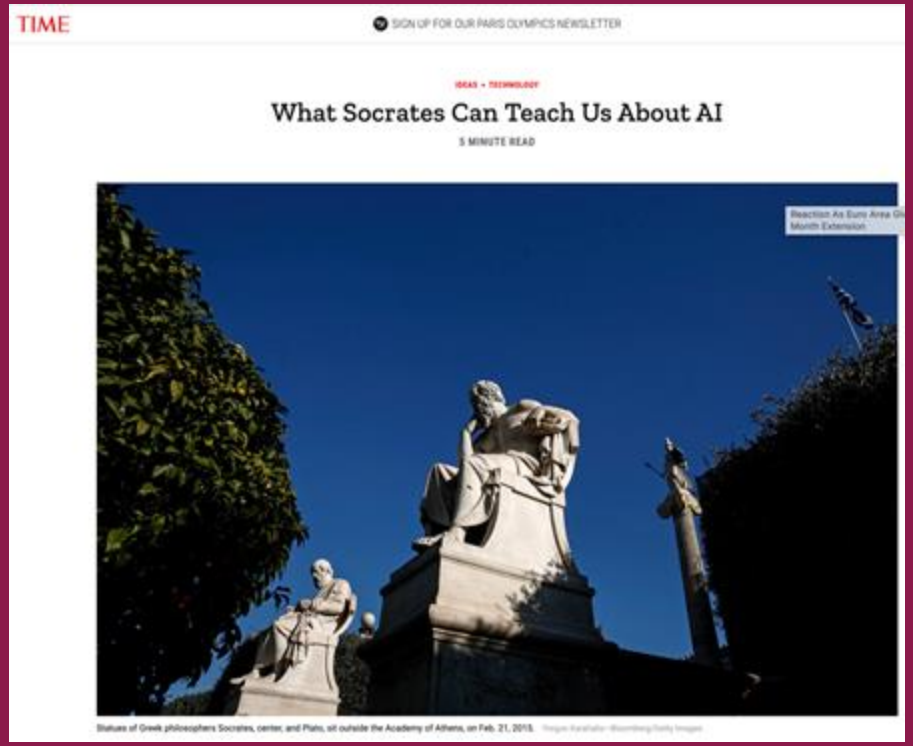
> *"Large language models [which is the technology behind text GenAI] are the ultimate bullshitters because they are designed to be plausible (and therefore convincing) with no regard for the truth."* [2]


TIME

SIGN UP FOR OUR PARIS OLYMPICS NEWSLETTER

IDEAS • TECHNOLOGY

What Socrates Can Teach Us About AI

5 MINUTE READ

Statues of Greek philosophers Socrates, center, and Plato, sit outside the Academy of Athens, on Feb. 21, 2015.

https://time.com/6299631/what-socrates-can-teach-us-about-ai/

https://time.com/6299631/what-socrates-can-teach-us-about-ai/

Large language models don't inform users that they are making statistical guesses. They present incorrect guesses with the same confidence as they present facts. Whatever you ask, they will come up with a convincing response, and it's never "I don't know," even though it should be. If you ask ChatGPT about current events, it will remind you that it only has access to information up to September 2021 and it can't browse the internet. For almost any other kind of question, it will venture a response that will often mix facts with confabulations.

The philosopher Harry Frankfurt famously argued that bullshit is speech that is typically persuasive but is detached from a concern with the truth. Large language models are the ultimate bullshitters because they are designed to be plausible (and therefore convincing) with no regard for the truth. Bullshit doesn't need to be false. Sometimes bullshitters describe things as they are, but if they are not aiming for the truth, what they say is still bullshit.

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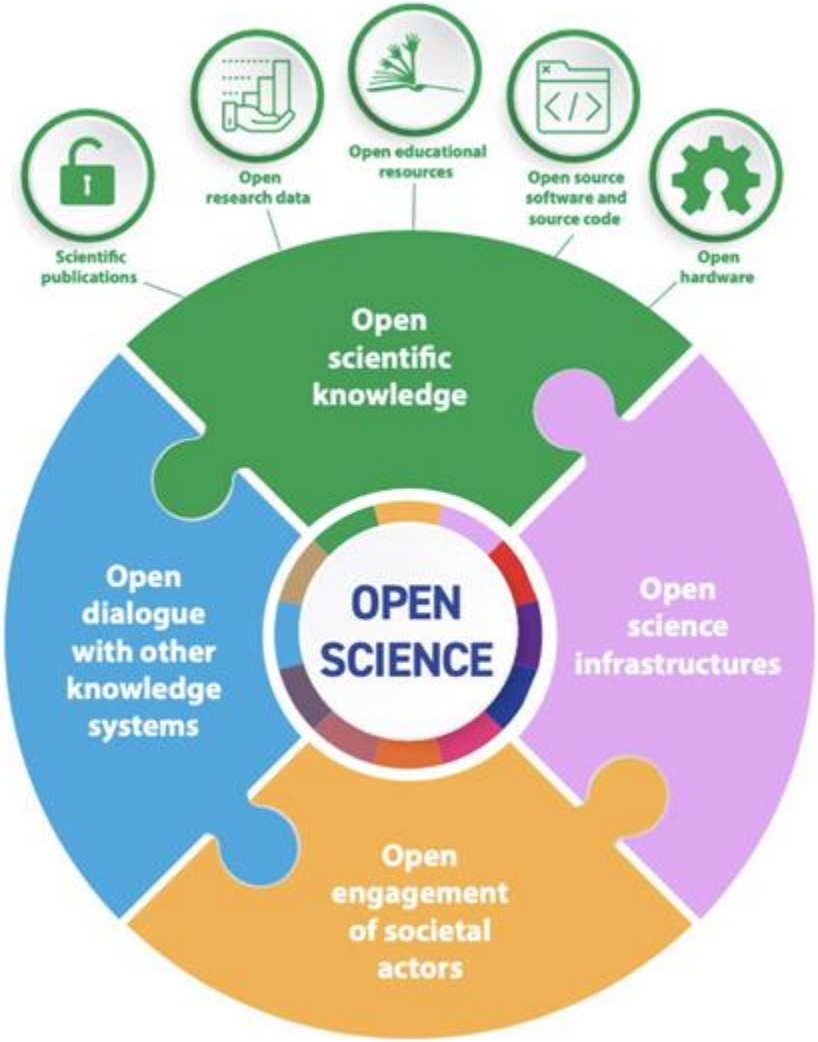
Open science principles to be noted when AI is an object in research



Open Scientific Knowledge

- Scientific Publications
- Open Research Data
- Open Educational Resources
- Open-Source Software and Source Code
- Open Hardware

UNESCO Recommendation of Open Science

https://unesdoc.unesco.org/ark:/48223/pf0000379949

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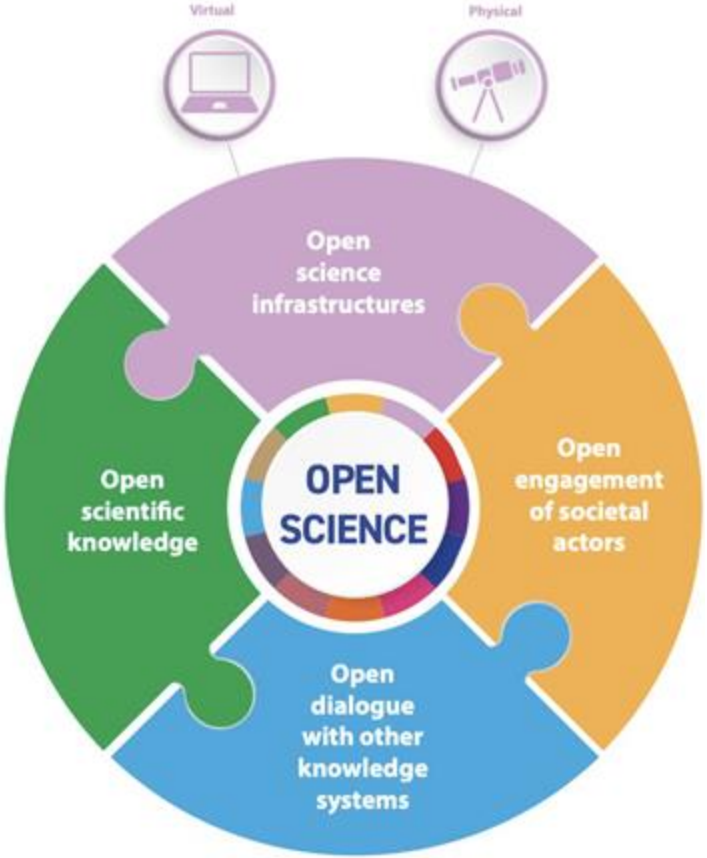
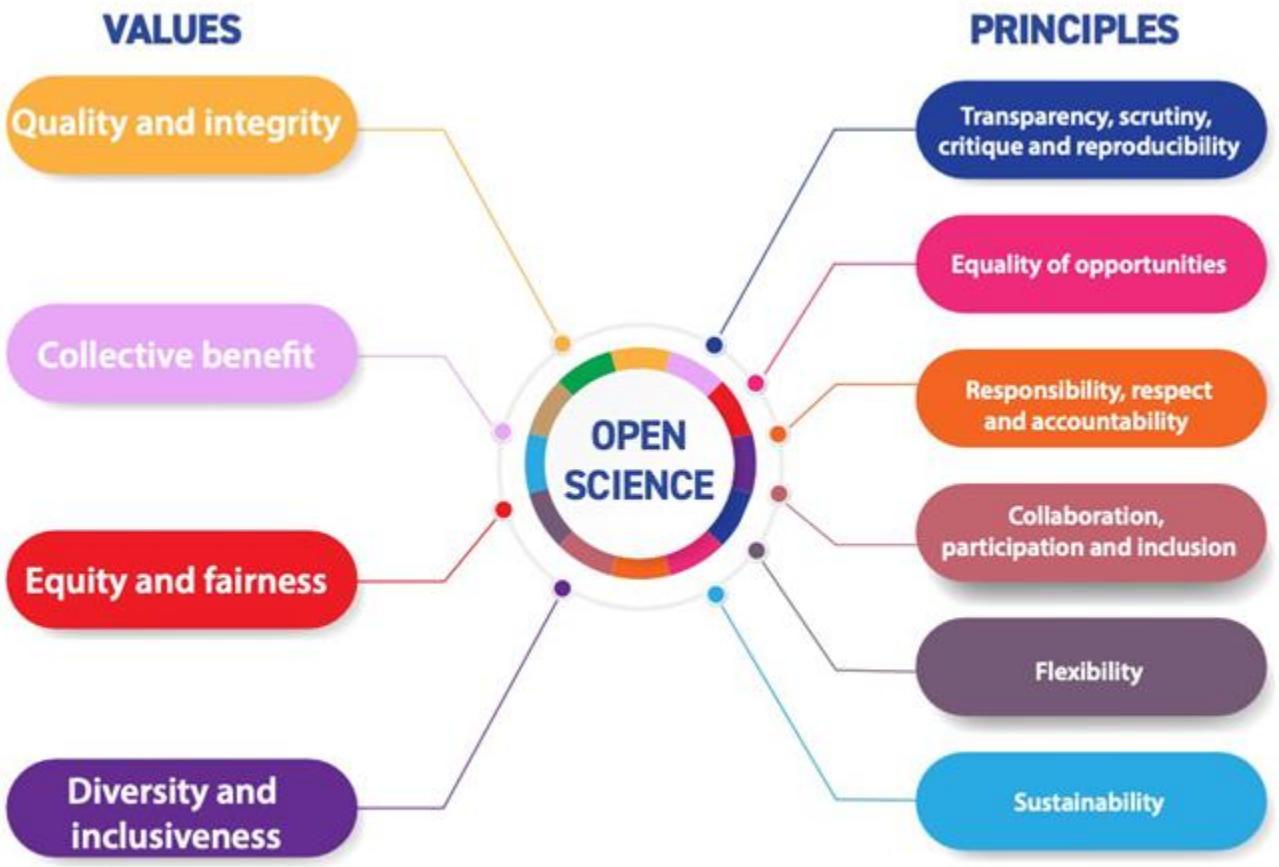
Open Science Infrastructures

- Virtual
- Physical




VALUES
Quality and integrity
Collective benefit
Equity and fairness
Diversity and inclusiveness
OPEN SCIENCE
PRINCIPLES
Transparency, scrutiny, critique and reproducibility
Equality of opportunities
Responsibility, respect and accountability
Collaboration, participation and inclusion
Flexibility
Sustainability

LOGIN
THE BOOKSELLER
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TOPICS
NEWS RIGHTS COMMENT BESTSELLERS BOOKS SPOTLIGHT EVENTS JOBS

Academic authors 'shocked' after Taylor & Francis sells access to their research to Microsoft AI

NEWS JUL 19, 2024 BY MATILDA BATTERSBY

Dr Ruth Clemens

Authors have expressed their shock after the news that academic publisher Taylor & Francis, which owns Routledge, had sold access to its authors' research as part of an Artificial Intelligence (AI) partnership with Microsoft—a deal worth almost £8m ($10m) in its first year.

The agreement with Microsoft was included in a trading update by the publisher's parent company in May this year. However, academics published by the group claim they have not been told about the AI deal, were not given the opportunity to opt out and are receiving no extra payment for the use of their research by the tech company.

The Society of Authors said it is "concerned to see publishers signing deals with tech companies without consulting authors and creators first".

Dr Ruth Alison Clemens, a lecturer in modern English literature whose work has been published by Taylor & Francis and Routledge, claimed authors hadn't been contacted about the AI deal.

The Society of Authors (SoA) urged authors who "find their work has been used without their consent" to contact them for guidance and encouraged authors to complete **a survey currently being conducted by the Authors' Licensing and Collecting Society** (ALCS) around collective licensing options for authors.

ALCS's c.e.o Barbara Hayes, told *The Bookseller:* "We know that developments in generative AI technologies are happening at speed with deals between publishers and technology companies the subject of regular media reports. We believe it's imperative that the interests and rights of authors are fully represented within these discussions and negotiations which is unfortunately often the step missing at present."

Earlier this week the Copyright Clearance Centre announced the availability of AI re-use rights within its **Annual Copyright License** (ACL) — which it claims is "the first-ever collective licensing solution for the internal use of copyrighted materials in AI systems." The license will provides holders with rights and remuneration for new uses of their content.

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AI in research in education - what the research argument can be?

The Perspective of Digital competences

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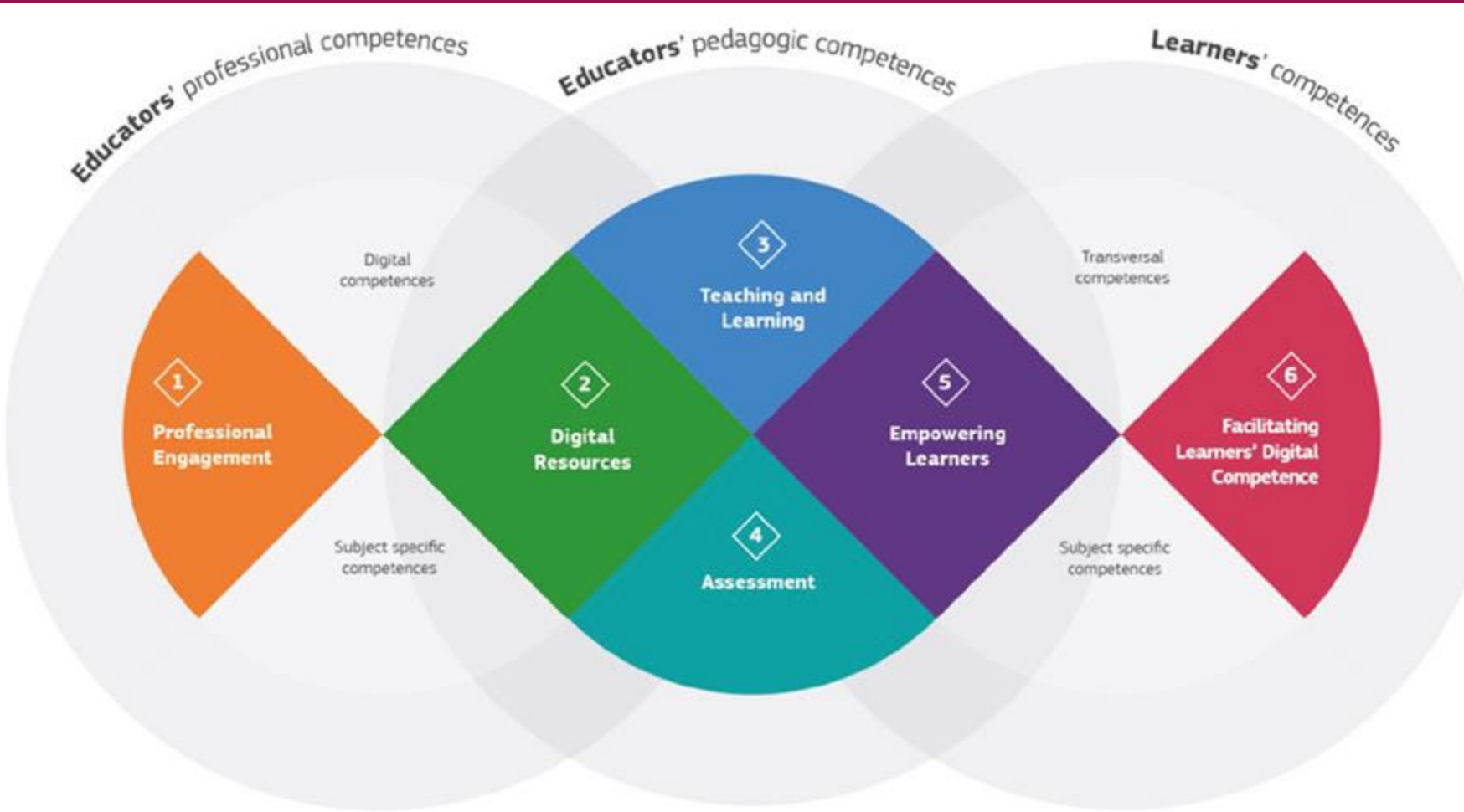
Educators' professional competences
Educators' pedagogic competences
Learners' competences
Digital competences
Transversal competences
Subject specific competences
Subject specific competences
1
Professional Engagement
2
Digital Resources
3
Teaching and Learning
4
Assessment
5
Empowering Learners
6
Facilitating Learners' Digital Competence

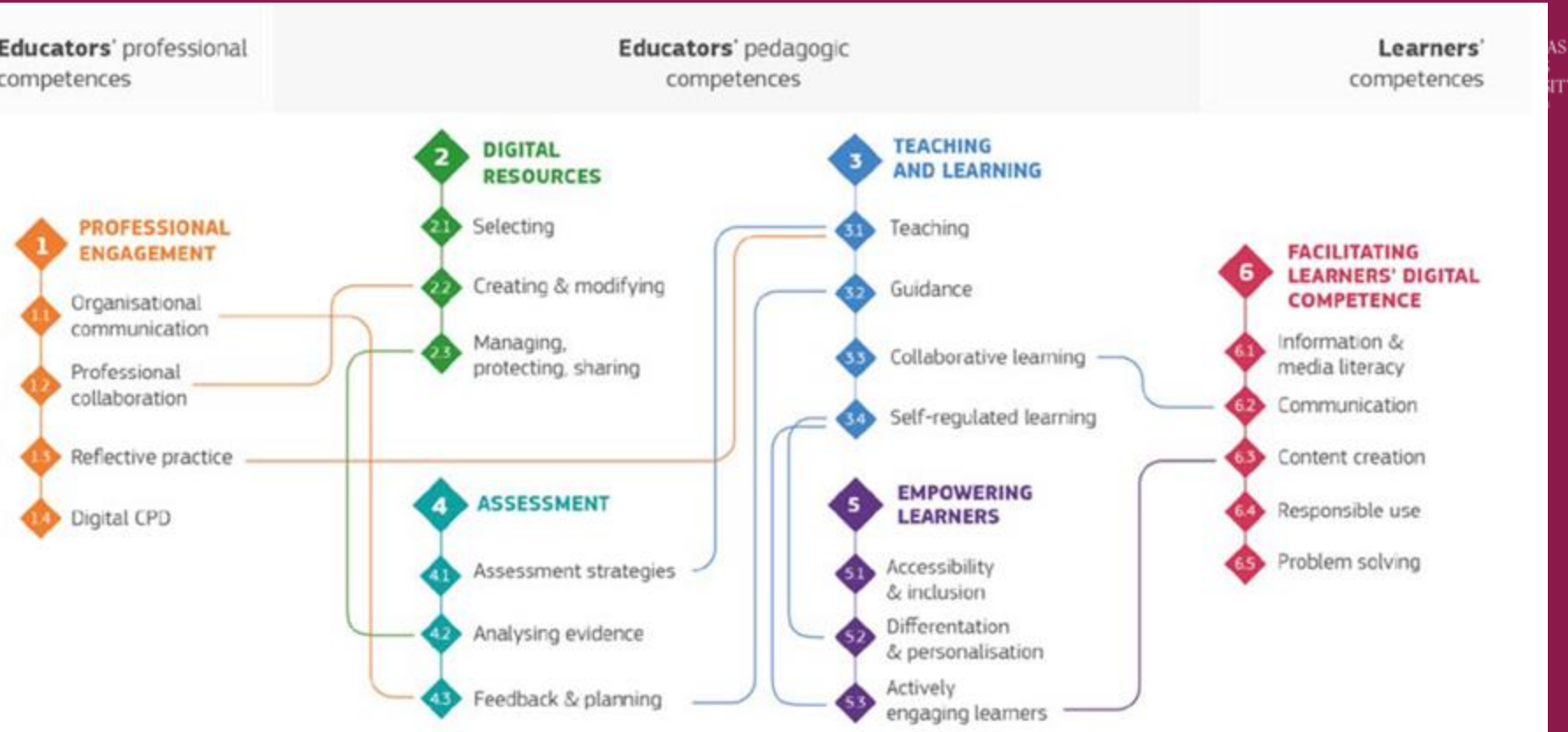

FIGURE 1: THE DIGCOMPEDU FRAMEWORK

	Knowledge (Content related expertise)	Skills (Application of knowledge)	Attitudes (Values and Responsibilities)
Dimension 2: Digital Resources			
Subset 2.1 **Selecting digital resources** To identify, assess and select digital resources for teaching and learning. To consider the specific learning objective, context, pedagogical approach, and learner group, when selecting digital resources and planning their use. (DigCompEdu)			
Explorer (Level A)	is aware of the potential of digital technologies for finding resources (e.g. common educational platforms which provide educational resources) and knows simple internet search strategies	makes basic use of digital technologies for finding resources (e.g. using simple internet search strategies)	little self-confidence when assessing and selecting digital resources
Expert (Level B)	knows complex criteria to identify suitable resources	assesses and selects digital resources using complex criteria: evaluates the quality of digital resources and their suitability for his/her learner group and specific learning objective and adapts his/her search strategies accordingly	strategic approach to selecting digital resources; commitment to improve available resources by giving feedback and recommendations
Pioneer (Level C)	knows how to comprehensively identify suitable resources	considers all relevant aspects and sources (e.g. collaborative platforms, official repositories) when assessing and selecting resources; promotes the use of digital resources with fellow educators by pointing out strategies and sources as well as sharing his/her own repository of resources. when using resources in class, he/she contextualises them for the students (e.g. by pointing out their source and potential bias)	commitment towards empowering others and promoting digital resources in education among his/her students and colleagues

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02 Digital Resources

Educators are currently confronted with a wealth of digital (educational) resources they can use for teaching. One of the key competences any educator needs to develop is to come to terms with this variety, to effectively identify resources that best fit their learning objectives, learner group and teaching style, to structure the wealth of materials, establish connections and to modify, add on to and develop themselves digital resources to support their teaching.

At the same time they need to be aware of how to responsibly use and manage digital content. They must respect copyright rules when using, modifying and sharing resources, and protect sensitive content and data, such as digital exams or students' grades.

Digital Resources

Selecting digital resources

To identify, assess and select digital resources for teaching and learning. To consider the specific learning objective, context, pedagogical approach, and learner group, when selecting digital resources and planning their use.

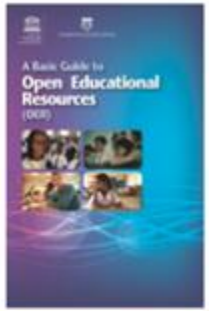
Creating and modifying digital resources

To modify and build on existing openly-licensed resources and other resources where this is permitted. To create or co-create new digital educational resources. To consider the specific learning objective, context, pedagogical approach, and learner group, when designing digital resources and planning their use.

Managing, protecting and sharing digital resources

To organise digital content and make it available to learners, parents and other educators. To effectively protect sensitive digital content. To respect and correctly apply privacy and copyright rules. To understand the use and creation of open licenses and open educational resources, including their proper attribution.

Reference: Redecker (2017)



A Basic guide to open educational resources (OER)

Corporate author : Commonwealth of Learning [55]
Person as author : Butcher, Neil [10], Kanwar, Asha [6], Uvalic-Trumbic, Stamenka [21]
ISBN : 978-1-894975-41-4
Collation : 133 p.
Language : English
Also available in : Español
Year of publication : 2011, 2015
Licence type : CC BY-SA 3.0 IGO [11280]
Type of document : book

Online
Open Access

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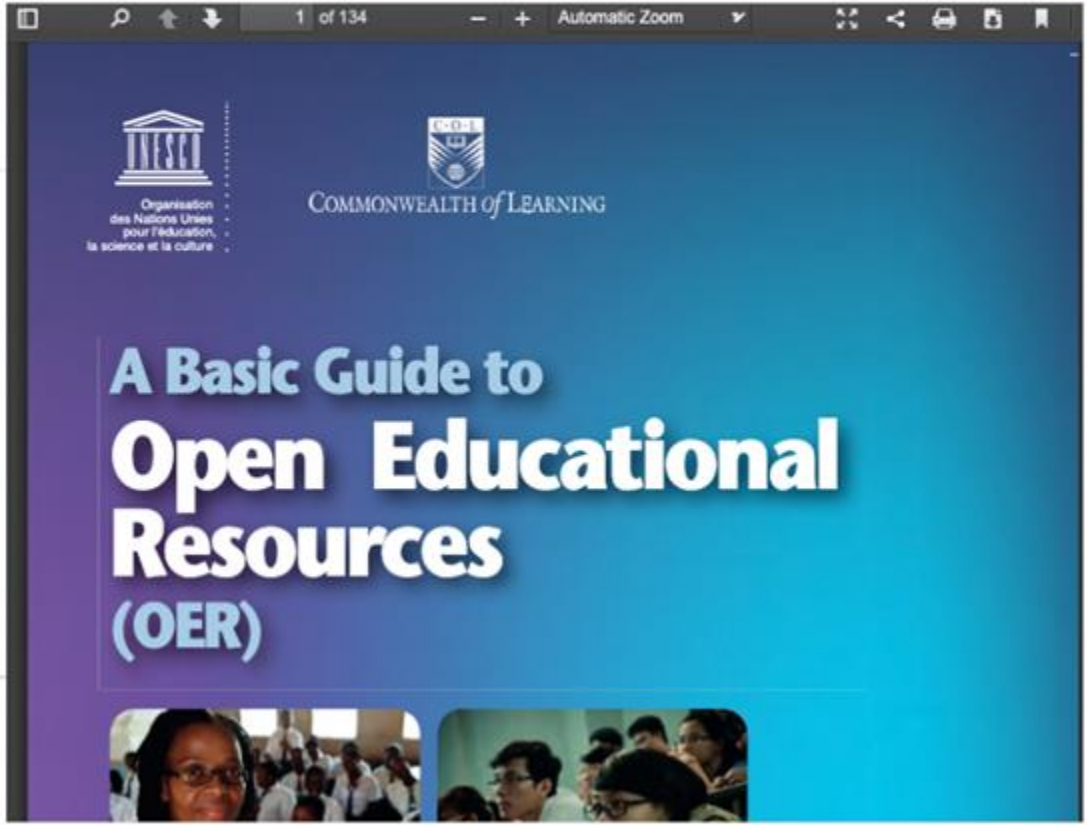
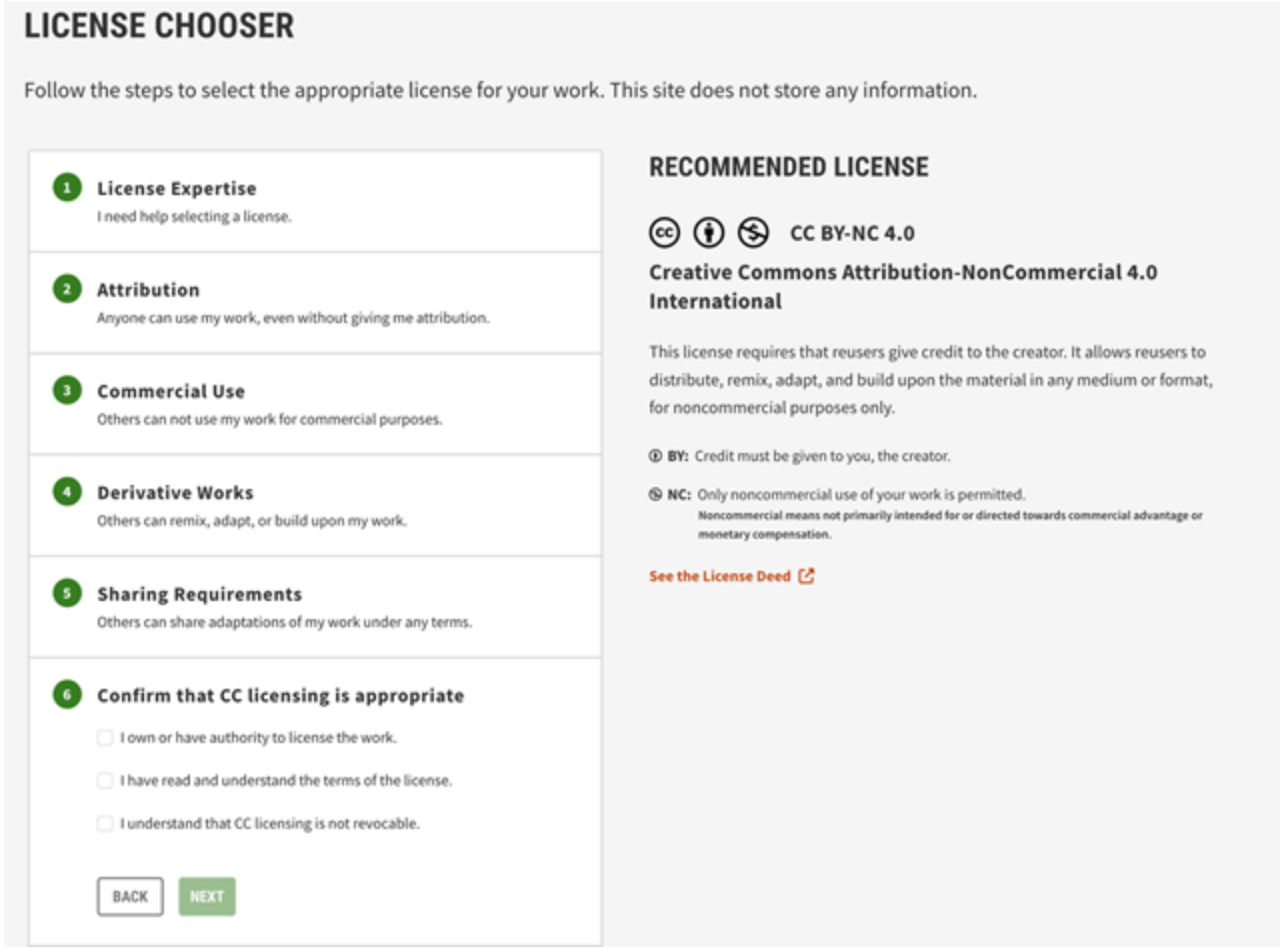
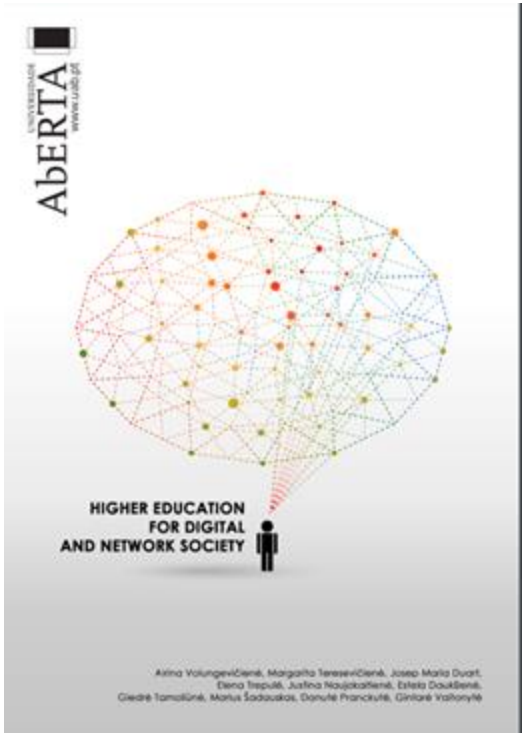
unesco UNESDOC Digital Library



https://chooser-beta.creativecommons.org/



Digital and networked society learning characteristics



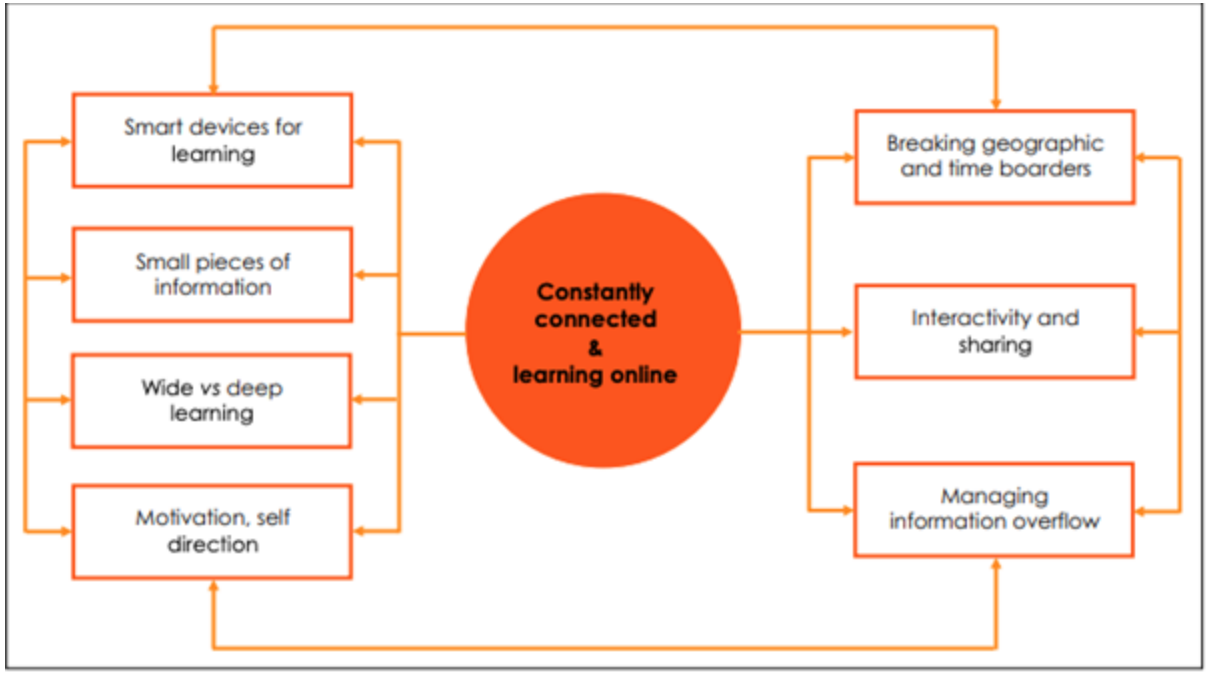


Figure 5. Constantly connected and learning online

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Empowering learners through opening online learning

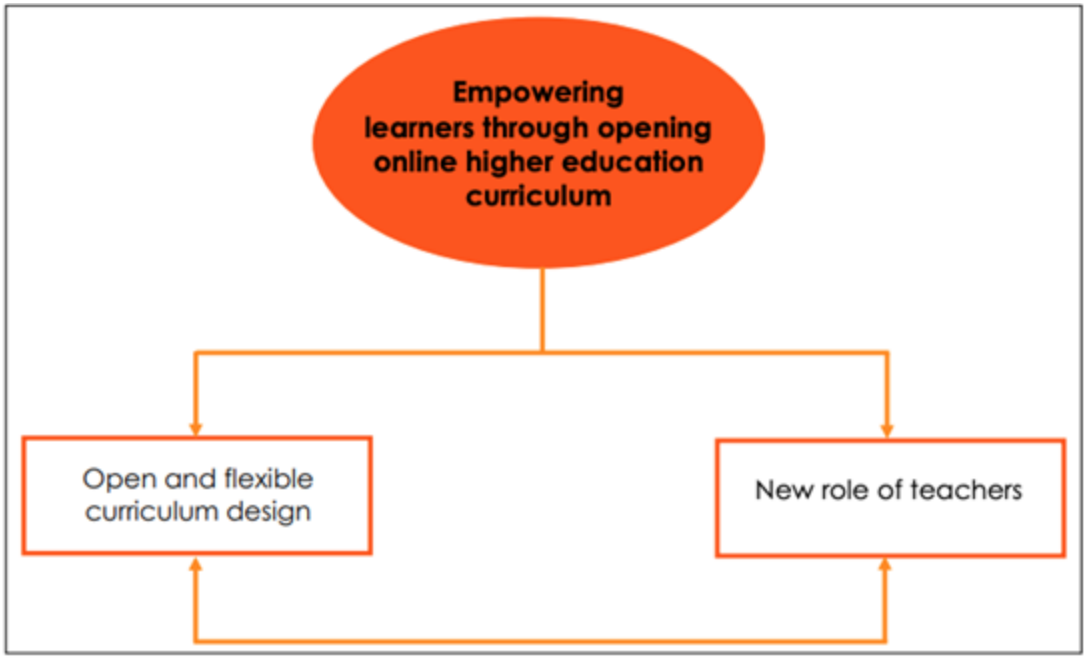

Figure 20. Empowering learners through opening online higher education curriculum

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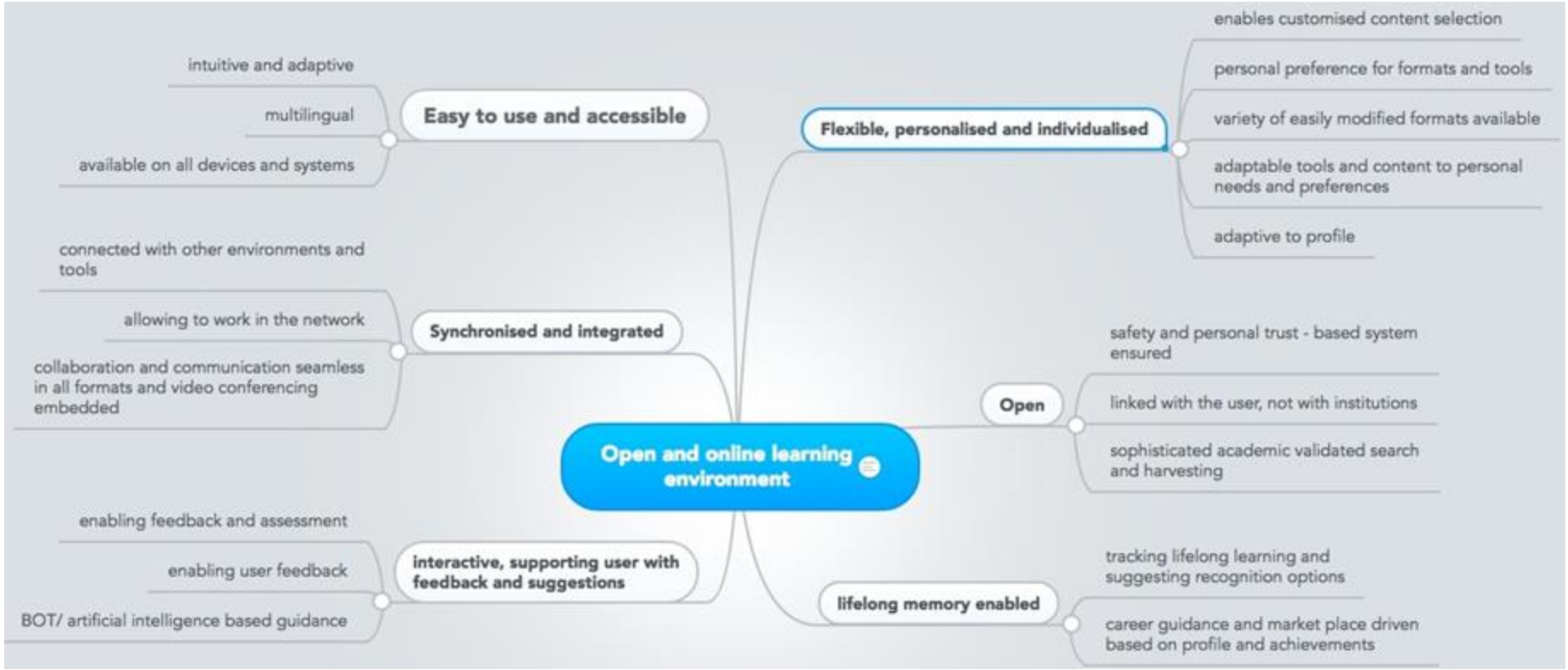
Expert interview/ thematic analysis results



OOL environment components

- the links between learner characteristics and learner achievements, learning styles and adaptive environments, teaching strategies, as well as teaching methods are often investigated
- Research highlights six most common research components of OOL environment:
  - Administration
  - learner behaviour
  - communication and collaboration
  - learning design and methodology
  - assessment and evaluation tools

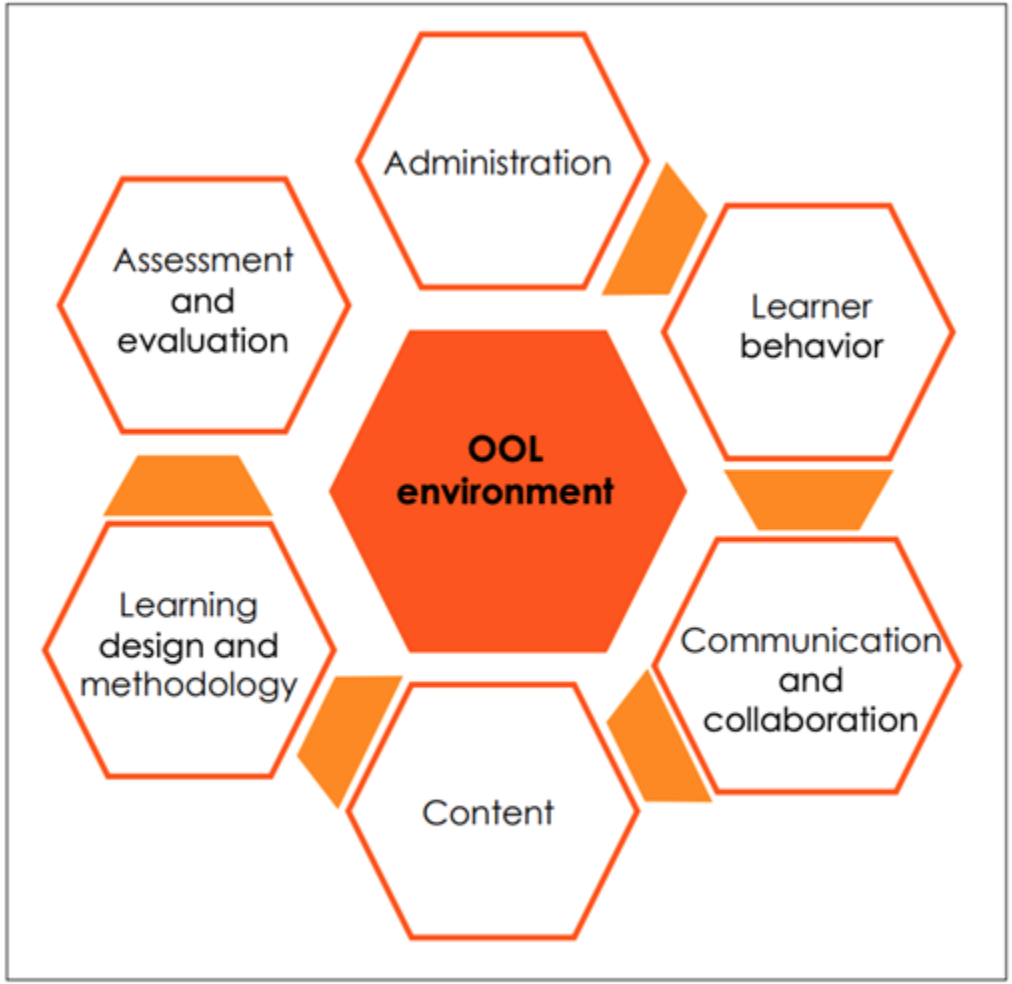
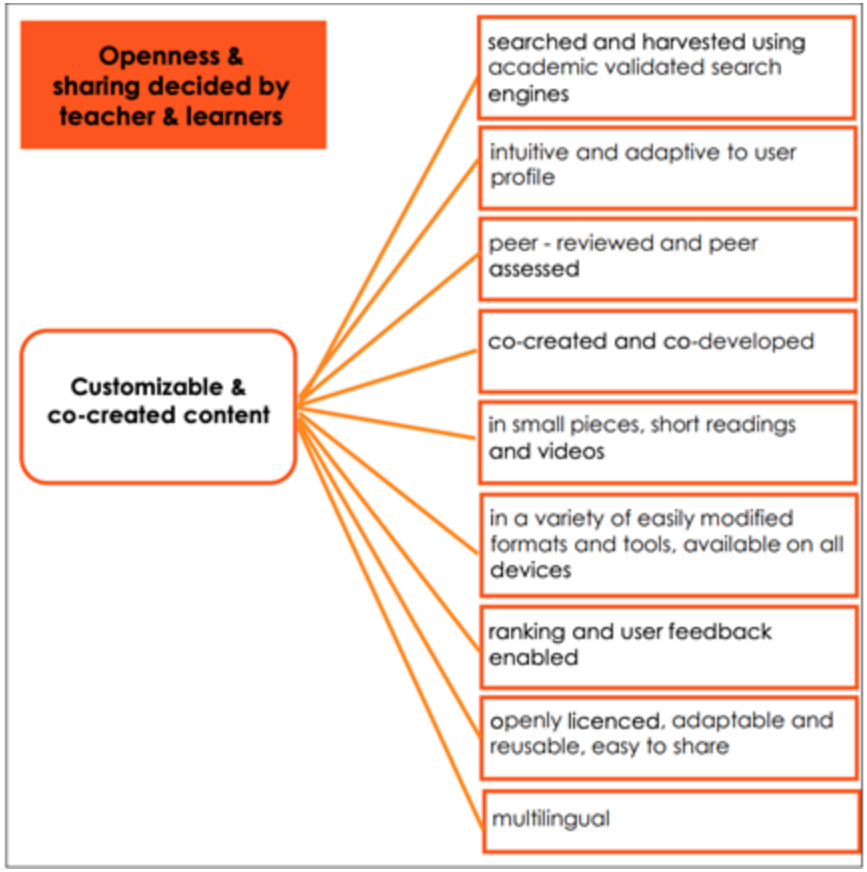
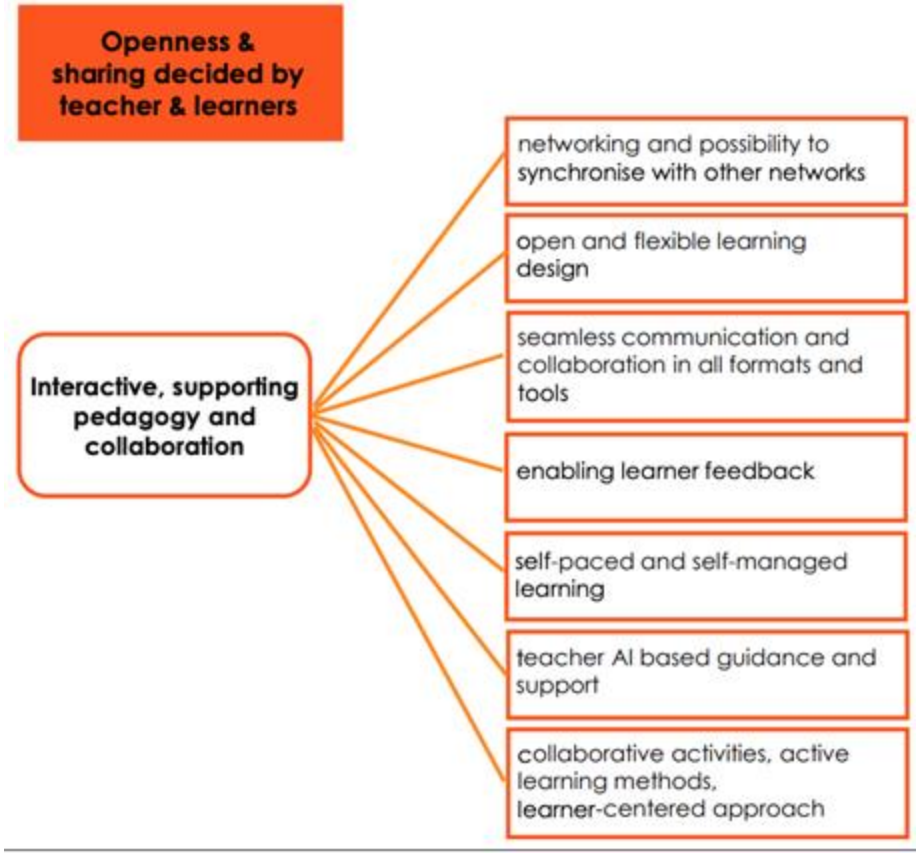
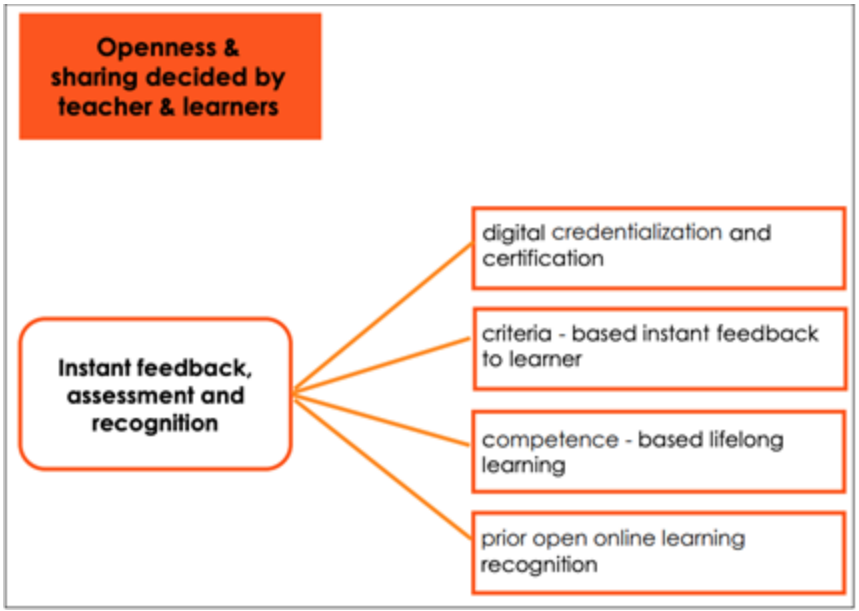


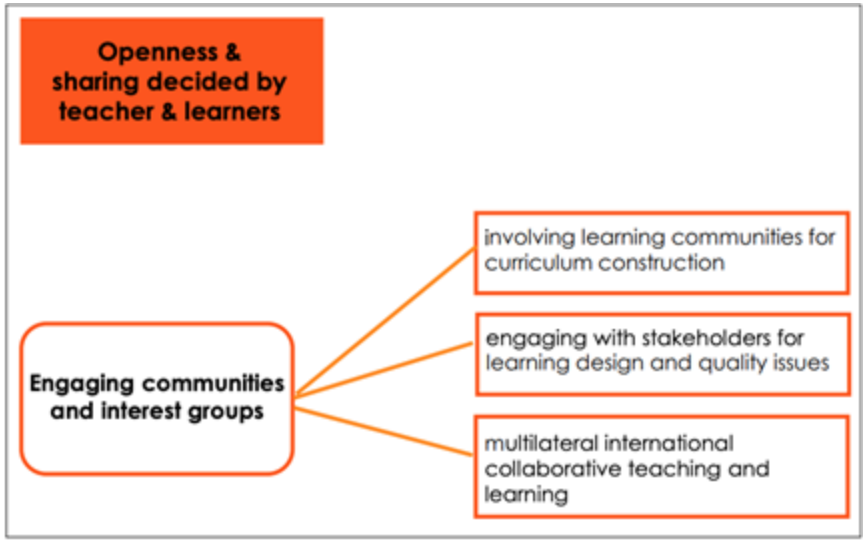
Figure 27. Open online learning environment components


Openness & sharing decided by teacher & learners
Customizable & co-created content
searched and harvested using academic validated search engines
intuitive and adaptive to user profile
peer - reviewed and peer assessed
co-created and co-developed
in small pieces, short readings and videos
in a variety of easily modified formats and tools, available on all devices
ranking and user feedback enabled
openly licenced, adaptable and reusable, easy to share
multilingual

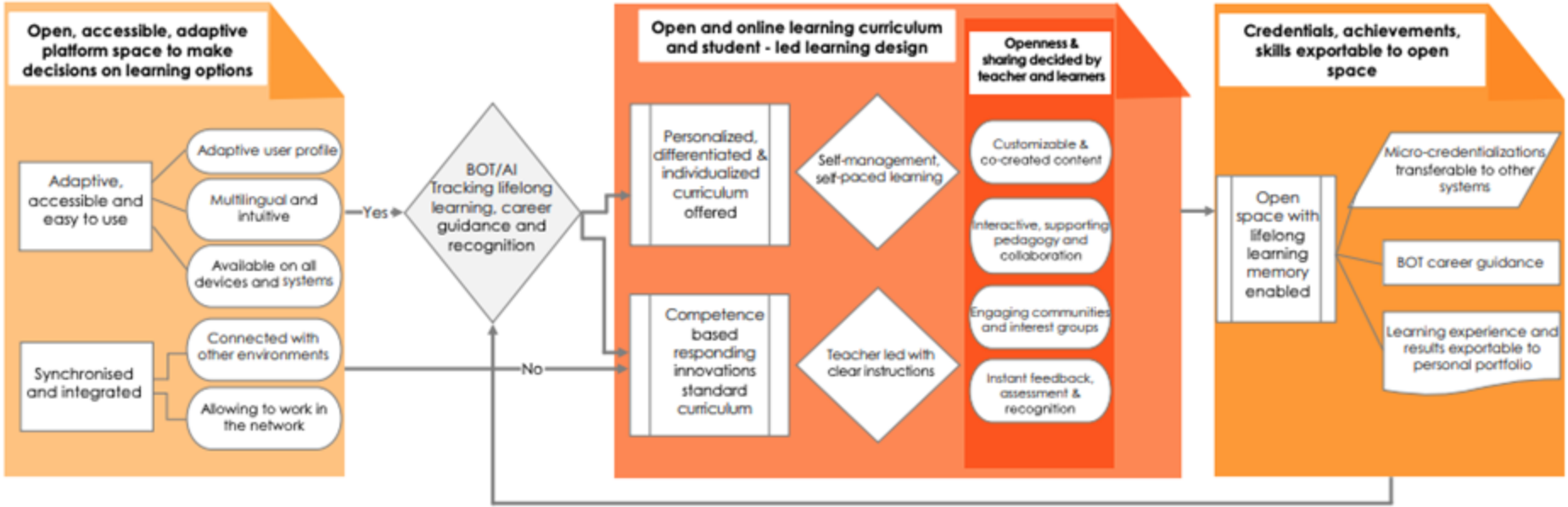

Openness & sharing decided by teacher & learners
Interactive, supporting pedagogy and collaboration
networking and possibility to synchronise with other networks
open and flexible learning design
seamless communication and collaboration in all formats and tools
enabling learner feedback
self-paced and self-managed learning
teacher AI based guidance and support
collaborative activities, active learning methods, learner-centered approach

OOL environment





The model of open and online learning environment meeting the needs of digital and network society



03 Teaching and Learning

Digital technologies can enhance and improve teaching and learning strategies in many different ways. However, whatever pedagogic strategy or approach is chosen, the educator's specific digital competence lies in effectively orchestrating the use of digital technologies in the different phases and settings of the learning process. The fundamental competence in this area – and maybe of the whole framework – is 3.1: Teaching. This competence refers to designing, planning and implementing the use of digital technologies in the different stages of the learning process.

Competences 3.2 to 3.4 complement this competence by emphasizing that the real potential of digital technologies lies in shifting the focus of the teaching process from teacher-led to learner-centred processes. Thus the role of a digitally-competent educator is to be a mentor and guide for learners in their progressively more autonomous learning endeavours. In this sense, digitally-competent educators need to be able to design new ways, supported by digital technologies, to provide guidance and support to learners, individually and collectively (3.2) and to initiate, support and monitor both self-regulated (3.4) and collaborative (3.3) learning activities.

Teaching and Learning

Teaching

To plan for and implement digital devices and resources in the teaching process, so as to enhance the effectiveness of teaching interventions. To appropriately manage and orchestrate digital teaching strategies. To experiment with and develop new formats and pedagogical methods for instruction.

Guidance

To use digital technologies and services to enhance the interaction with learners, individually and collectively, within and outside the learning session. To use digital technologies to offer timely and targeted guidance and assistance. To experiment with and develop new forms and formats for offering guidance and support.

Collaborative learning

To use digital technologies to foster and enhance learner collaboration. To enable learners to use digital technologies as part of collaborative assignments, as a means of enhancing communication, collaboration and collaborative knowledge creation.

Self-regulated learning

To use digital technologies to support learners' self-regulated learning, i.e. to enable learners to plan, monitor and reflect on their own learning, provide evidence of progress, share insights and come up with creative solutions.

TABLE 3: AREA 3 - TEACHING AND LEARNING

Competences for teaching *with* AI

Area 1: Professional Engagement

Area 2: Digital resources

Area 3: Teaching and Learning

Area 4: Assessment

Area 5: Empowering Learners

Area 6: Facilitating learners' digital

6

Competence areas in DigComp

Competences for teaching *for* AI

1. Information and data literacy
2. Communication and collaboration
3. Digital content creation
4. Safety
5. Problem solving

Competences for teaching *about* AI

Basic digital skills

- Content creation
- Cloud usage
- Data analysis and representation
- Collaboration and communication tools

Computational thinking

- Design thinking
- Problem-solving
- Block-based programming
- Text-based programming

Mathematics

- Fundamentals of statistics
- Fundamentals of probability

Existing applications of AI

- To provide a realistic view of AI
- To be updated on the real usage of AI
- Ethics behind real cases
- Legal issues and data privacy

Specific AI topics

- Perception and actuation
- Representation and reasoning
- Machine learning

04 Assessment

Assessment can be a facilitator or bottleneck to innovation in education. When integrating digital technologies into learning and teaching, we must consider how digital technologies can enhance existing assessment strategies. At the same time, we must also consider how they can be used to create or to facilitate innovative assessment approaches. Digitally-competent educators should be able to use digital technologies within assessment with those two objectives in mind.

Furthermore, the use of digital technologies in education, whether for assessment, learning, administrative or other purposes, results in a wide range of data being available on each individual learner's learning behaviour. Analysing and interpreting this data and using it to help make decisions is becoming more and more important – complemented by the analysis of conventional evidence on learner behaviour.

Assessment

Assessment strategies

To use digital technologies for formative and summative assessment. To enhance the diversity and suitability of assessment formats and approaches.

Analysing evidence

To generate, select, critically analyse and interpret digital evidence on learner activity, performance and progress, in order to inform teaching and learning.

Reference: Redecker (2017)

Empowering Learners

Accessibility and inclusion

To ensure accessibility to learning resources and activities, for all learners, including those with special needs. To consider and respond to learners' (digital) expectations, abilities, uses and misconceptions, as well as contextual, physical or cognitive constraints to their use of digital technologies.

Differentiation and personalisation

To use digital technologies to address learners' diverse learning needs, by allowing learners to advance at different levels and speeds, and to follow individual learning pathways and objectives.

Actively engaging learners

To use digital technologies to foster learners' active and creative engagement with a subject matter. To use digital technologies within pedagogic strategies that foster learners' transversal skills, deep thinking and creative expression. To open up learning to new, real-world contexts, which involve learners themselves in hands-on activities, scientific investigation or complex problem solving, or in other ways increase learners' active involvement in complex subject matters.

TABLE 5: AREA 5 – EMPOWERING LEARNERS


sciendo
About
Publish with us
Subjects
Blog
Team
Accessibility Menu
Home > Learning Analytics: a Metacognitive Tool to Engage Students
Books
Learning Analytics: a Metacognitive Tool to Engage Students
RESEARCH STUDY
Airina Volungevičienė
Learning Analytics: a Metacognitive Tool to Engage Students
Open Access
Sciendo, 2021
DOI: https://doi.org/10.2478/9788366675643
Download
Cite
Share
Details
BY SA
Format: Book
First Published: 20 Dec 2021
Languages: English
Pages: 200
Copyright: ©
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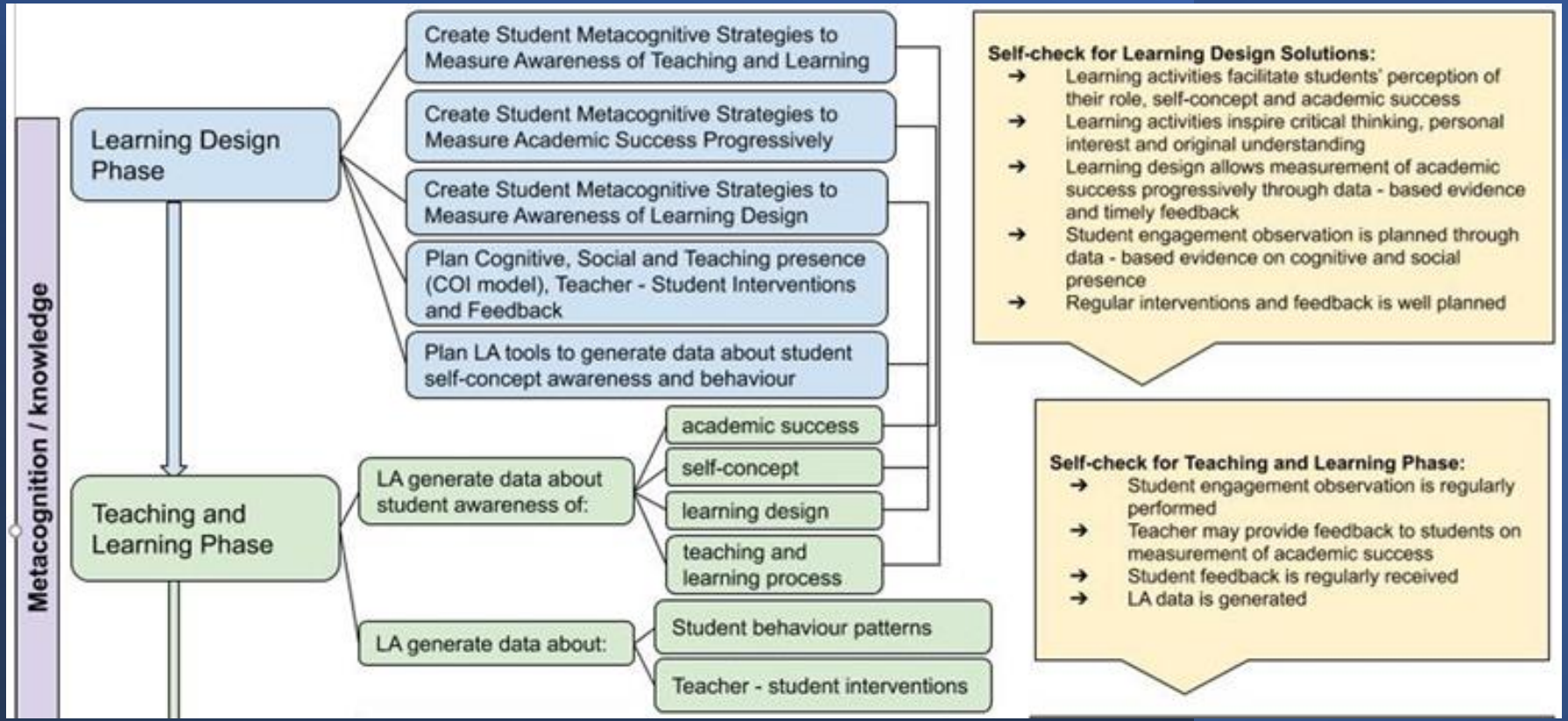
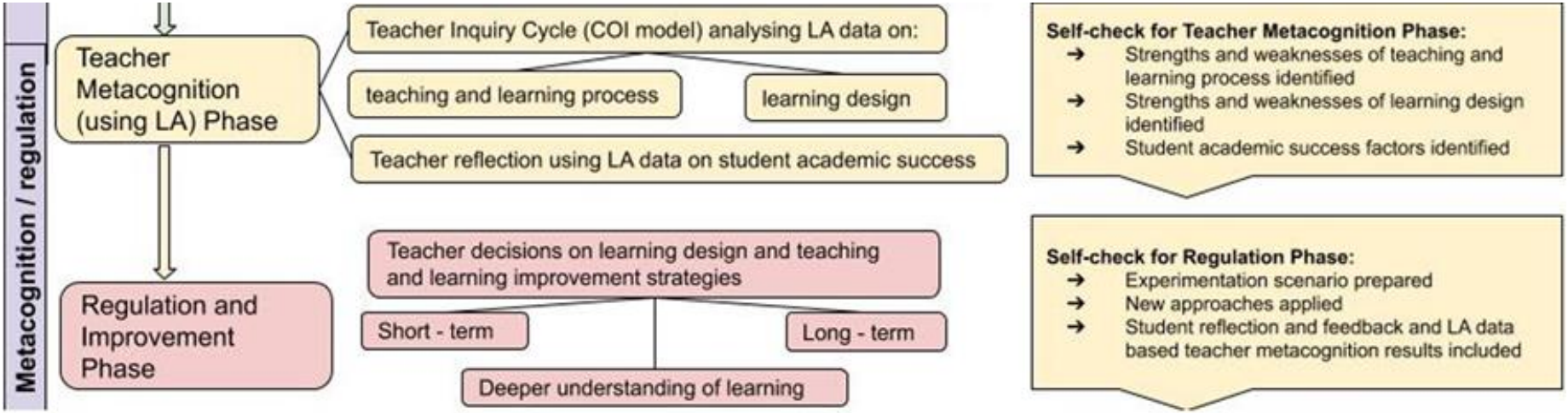
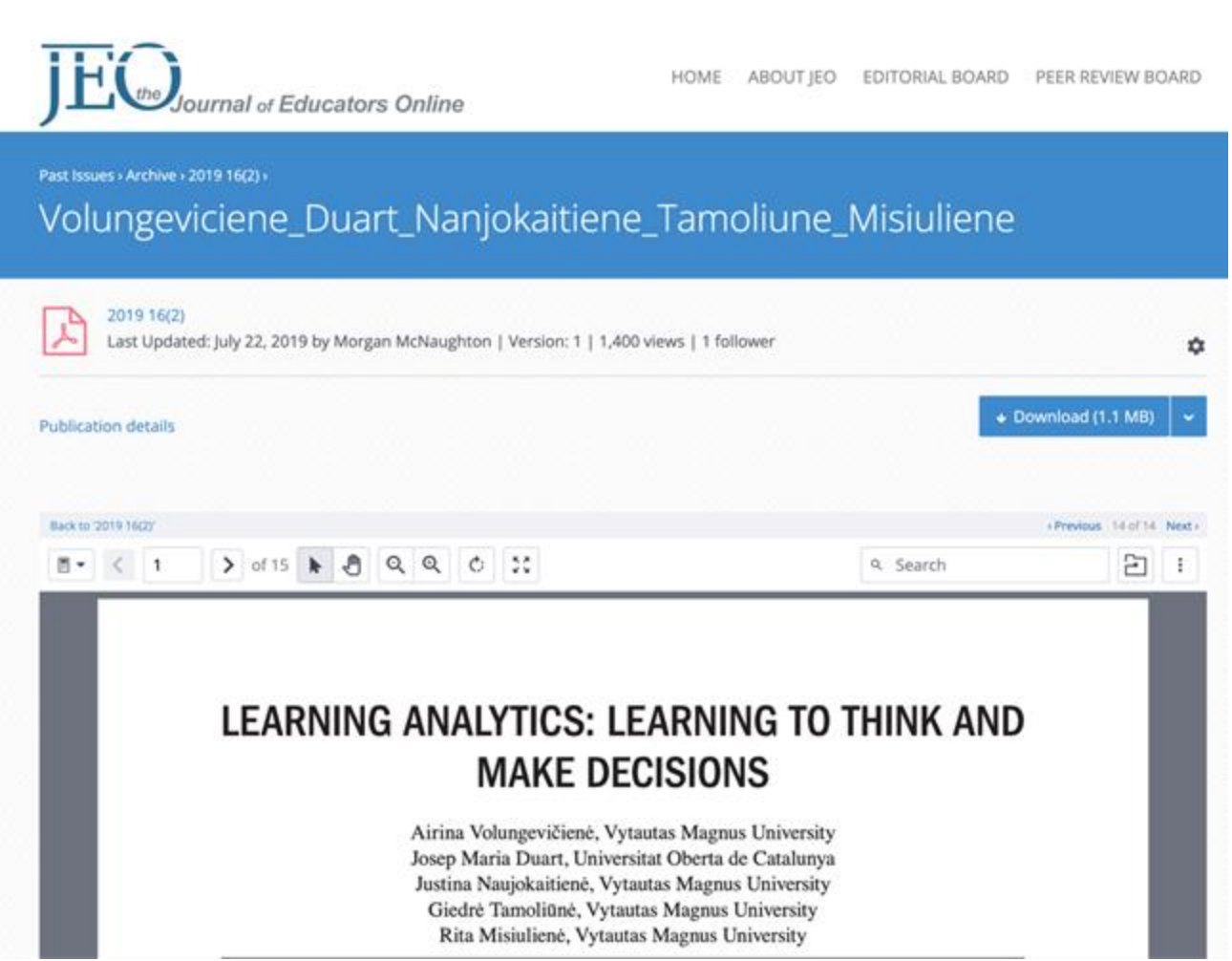

Metacognition / knowledge
Learning Design Phase
Create Student Metacognitive Strategies to Measure Awareness of Teaching and Learning
Create Student Metacognitive Strategies to Measure Academic Success Progressively
Create Student Metacognitive Strategies to Measure Awareness of Learning Design
Plan Cognitive, Social and Teaching presence (COI model), Teacher - Student Interventions and Feedback
Plan LA tools to generate data about student self-concept awareness and behaviour
Teaching and Learning Phase
LA generate data about student awareness of:
academic success
self-concept
learning design
teaching and learning process
LA generate data about:
Student behaviour patterns
Teacher - student interventions
Self-check for Learning Design Solutions:
→ Learning activities facilitate students' perception of their role, self-concept and academic success
→ Learning activities inspire critical thinking, personal interest and original understanding
→ Learning design allows measurement of academic success progressively through data - based evidence and timely feedback
→ Student engagement observation is planned through data - based evidence on cognitive and social presence
→ Regular interventions and feedback is well planned
Self-check for Teaching and Learning Phase:
→ Student engagement observation is regularly performed
→ Teacher may provide feedback to students on measurement of academic success
→ Student feedback is regularly received
→ LA data is generated


Metacognition / regulation
Teacher Metacognition (using LA) Phase
Teacher Inquiry Cycle (COI model) analysing LA data on:
teaching and learning process
learning design
Teacher reflection using LA data on student academic success
Regulation and Improvement Phase
Teacher decisions on learning design and teaching and learning improvement strategies
Short - term
Long - term
Deeper understanding of learning
Self-check for Teacher Metacognition Phase:
→ Strengths and weaknesses of teaching and learning process identified
→ Strengths and weaknesses of learning design identified
→ Student academic success factors identified
Self-check for Regulation Phase:
→ Experimentation scenario prepared
→ New approaches applied
→ Student reflection and feedback and LA data based teacher metacognition results included



How can learning analytics as a metacognitive tool be applied to developing a reflective teacher practice?

- implementation of teacher inquiry cycle and reflection on open and online teaching
- for improving curriculum and learning design

https://www.thejeo.com/archive/archive/2019_162/volungeviciene_duart_nanjokaitiene_tamoliune_misiuliene

06 Facilitating Learners' Digital Competence

Digital competence is one of the transversal competences educators need to instil in learners. Whereas fostering other transversal competences is only part of educators' digital competence in as far as digital technologies are used to do so, the ability to facilitate learners' digital competence is an integral part of educators' digital competence. Because of this, this ability merits a dedicated area in the DigCompEdu framework.

Learners' digital competence is captured by the European Digital Competence Framework for Citizens (DigComp). Thus, the DigCompEdu area follows the same logic and details five competences aligned in content and description with DigComp. The headlines, however, have been adapted to emphasize the pedagogical dimension and focus within this framework.

Facilitating Learners' Digital Competence

Information and media literacy

To incorporate learning activities, assignments and assessments which require learners to articulate informati needs; to find information and resources in digital environments; to organise, process, analyse and interpret information; and to compare and critically evaluate the credibility and reliability of information and its sources.

Digital communication and collaboration

To incorporate learning activities, assignments and assessments which require learners to effectively and responsibly use digital technologies for communication, collaboration and civic participation.

Digital content creation

2. THE DIGITAL COMPETENCE FRAMEWORK FOR CITIZENS

In DigComp, 5 competence areas outline what the digital competence entails. They are the following: Information and data literacy; Communication and collaboration; Digital content creation; Safety; and Problem solving.

The first 3 areas deal with competences that can be traced back to specific activities and uses. On the other hand, areas 4 and 5 (Safety and Problem solving) are "transversal" as they apply to any type of activity carried out through digital means. Elements of Problem solving, in particular, are present in all competences, but a specific area was defined to highlight the importance of this aspect for the appropriation of technology and digital practices.

Information and data literacy

To articulate information needs, to locate and retrieve digital data, information and content.

To judge the relevance of the source and its content.

To store, manage, and organise digital data, information and content.

Communication and collaboration

To interact, communicate and collaborate through digital technologies while being aware of cultural and generational diversity.

To participate in society through public and private digital services and participatory citizenship.

To manage one's digital presence, identity and reputation.

Digital content creation

To create and edit digital content.

To improve and integrate information and content into an existing body of knowledge while understanding how copyright and licences are to be applied.

To know how to give understandable instructions for a computer system.

Safety

To protect devices, content, personal data and privacy in digital environments.

To protect physical and psychological health, and to be aware of digital technologies for social well-being and social inclusion.

To be aware of the environmental impact of digital technologies and their use.

Problem solving

To identify needs and problems, and to resolve conceptual problems and problem situations in digital environments.

To use digital tools to innovate processes and products.

To keep up-to-date with the digital evolution.

FIG.3 DigComp areas (Dimension 1)

DIMENSION 1 • **COMPETENCE AREA**

3. DIGITAL CONTENT CREATION

DIMENSION 2 • **COMPETENCE**

3.1 DEVELOPING DIGITAL CONTENT

To create and edit digital content in different formats, to express oneself through digital means.

DIMENSION 3 • **PROFICIENCY LEVEL**

FOUNDATION	1	At basic level and with guidance, I can:	• **identify** ways to create and edit simple content in **simple** formats. • **choose** how I express myself through the creation of **simple** digital means.
	2	At basic level and with autonomy and appropriate guidance where needed, I can:	• **identify** ways to create and edit **simple** content in simple formats. • **choose** how I express myself through the creation of **simple** digital means.
INTERMEDIATE	3	On my own and solving straightforward problems, I can:	• **indicate** ways to create and edit **well-defined and routine** content in **well-defined and routine** formats. • **express** myself through the creation of **well-defined and routine** digital means.
	4	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **indicate** ways to create and edit content in different formats. • **express** myself through the creation of digital means.
ADVANCED	5	As well as guiding others, I can:	• **apply** ways to create and edit content in different formats. • **show** ways to express myself through the creation of digital means.
	6	At advanced level, according to my own needs and those of others, and in complex contexts, I can:	• **change** content using the **most appropriate** formats. • **adapt** the expression of myself through the creation of the **most appropriate** digital means.
HIGHLY SPECIALISED	7	At highly specialised level, I can:	• **create solutions to complex problems with limited definition** that are related to content creation and edition in different formats, and self-expression through digital means. • **integrate my knowledge to contribute to professional practice and knowledge and guide others** in developing content.
	8	At the most advanced and specialised level, I can:	• **create solutions to solve complex problems with many interacting factors** that are related to content creation and edition in different formats, and self-expression through digital means. • **propose new** ideas and processes to the field.

DIMENSION 4 • **EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES**

NEW IN 2.2

KNOWLEDGE

118. Knows that digital content exists in a digital form and that there are many different types of digital content (e.g. audio, image, text, video, applications) that are stored in various digital file formats.
119. Knows that AI systems can be used to automatically create digital content (e.g. texts, news, essays, tweets, music, images) using existing digital content as its source. Such content may be difficult to distinguish from human creations. (AI)
120. Aware that "digital accessibility" means ensuring that everyone, including people with disabilities, can use and navigate the internet. Digital accessibility includes accessible websites, digital files and documents, and other web-based applications (e.g. for online banking, accessing public services, and messaging and video-calling services). (DA)
121. Aware that virtual reality (VR) and augmented reality (AR) allow new ways to explore simulated environments and interactions within the digital and physical worlds.

SKILLS

122. Can use tools and techniques to create accessible digital content (e.g. add ALT text to images, tables and graphs; create a proper and well-labelled document structure; use accessible fonts, colours, links) following official standards and guidelines (e.g. WCAG 2.1 and EN 301 549). (DA)
123. Knows how to select the appropriate format for digital content according to its purpose (e.g. saving a document in an editable format vs one that cannot be modified but is easily printed).
124. Knows how to create digital content to support one's own ideas and opinions (e.g. to produce data representations such as interactive visualisations using basic datasets such as open government data).
125. Knows how to create digital content on open platforms (e.g. create and modify text in a wiki environment).
126. Knows how to use Internet of Things (IoT) and mobile devices to create digital content (e.g. use embedded cameras and microphones to produce photos or videos).

ATTITUDES

127. Inclined to combine various types of digital content and data to better express facts or opinions for personal and professional use.
128. Open to explore alternative pathways to find solutions to produce digital content.
129. Inclined to follow official standards and guidelines (e.g. WCAG 2.1 and EN 301 549) to test the accessibility of a website, digital files, documents, e-mails or other web-based applications that one has created. (DA)

Problems addressed by the #EuropeanDigitalEducationHub

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- EU member states ban technologies at school (smart phones, screens, etc), others – recommend NOT to use them during the lectures
- Evidence - based challenges causing health and learning habbit problems – being – *unwell*
  - *Screen time - school students add learning screen to leasure screen time (they refuse to shorten communication and leasure time using mobile devices)*
  - *Brain and sight problems replacing meetings with video meetings and printed books with digital books*
  - *Attention deficit, digital fatigue and brain fog caused by scrolling,automatic play, attention design, notifications, likes and more...*
- Poor academic performance and lower academic achievements >> consequently, self – esteem of a personality (in the longer run)

“Acknowledging the positive effect social media can have on society, MEPs are concerned about the physical, psychological and material harm addictive design can have, including loss of concentration and cognitive ability, burnout, stress, depression, limited physical activity. They are particularly worried about the prolonged impact on minors’ health, and want more research on the risks related to online services.”

https://www.europarl.europa.eu/news

Problems because of a wrong way?

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- The *hype* of the *problem* during and after pandemics clarified *the lack of balance and quality* of the solutions proposed to schools
- Schools and teachers shared disappointment with EdTech and education communication gap increased
- 50 years of legacy of online and digital learning and teaching were *ignored*
- Newcomers into digital education were “kicking the doors“ and lobbying with EdTech which was too young and underdeveloped
- Top-down approach and funding proved unsustainable for many and *spoilt the broth* at school
- Digital fatigue, resilience took over
- Disappointment with the process and the results – what‘s next? – BAN!

Measures on the way

New EU rules needed to address digital addiction

- Call to ban addictive techniques like endless scrolling or automatic play
- Moving from attention economy to ethical design
- Introduction of digital “right to not be disturbed”
- All online services and products must be safe for children to use
- This link provides you with more info: New EU rules needed to address digital addiction | News | European Parliament (europa.eu)

“companies should be obliged to develop ethical and fair digital products and services”

https://www.europarl.europa.eu/news/en/press-room/20231208IPR15767/new-eu-rules-needed-to-address-digital-addiction

European Commission

Join European Digital Education Hub

Mentorship and Clinics
Knowledge Building Activities
Accelerator
Reading Corner

… and much more!

A2. CITIZENS INTERACTING WITH AI SYSTEMS

Main authors: Riina Vuorikari, Wayne Holmes

Today, for citizens to engage confidently, critically and safely with new and emerging technologies, including systems driven by artificial intelligence (AI), they need to acquire a basic understanding of such tools and technologies (DEAP2).

Greater awareness will also lead to improved sensibility towards potential issues related to data protection and privacy, ethics, children's rights and bias – including accessibility, gender bias and disabilities. The DigComp 2.2 update addresses the topic of citizens interacting with AI systems rather than focusing on the knowledge about Artificial Intelligence per se (see Box 6).

The co-creation process of the 2.2 update resulted in a list of more than 80 examples of knowledge, skills and attitudes related to citizens interacting with AI systems (see more about the process in **FIG.9**). 35 are included in Dimension 4 so that each DigComp competence area has a number of examples that illustrate various aspects to pay attention to when citizens interact with AI systems. The selection was guided by the feedback collected through public validation.

Additionally, a separate appendix on this new topic was created. It covers all 73 examples which have been revised according to comments received through the public validation. In this appendix, the examples are thematically grouped so as to facilitate the reading. After each example, the corresponding number to the competence is given. This can help curriculum developers and trainers to get inspired when updating their content regarding new and emerging technologies. The list of examples below should not be considered as a ready curriculum to teach about AI as such. Whereas these examples cover competences outlined in the DigComp conceptual reference model, they leave out some themes and topics that might be considered rudimentary when providing a curriculum outline or a training syllabus about AI and emerging technologies (e.g. what is AI, history of AI, different types of AI).

A. What do AI systems do and what do they not do?
B. How do AI systems work?
C. When interacting with AI systems
D. The challenges and ethics of AI
E. Attitudes regarding human agency and control

A **little red dot** identifies the examples **included in DigComp2.2**

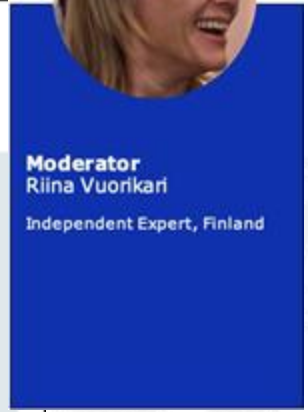
BOX 6. Requirements for citizens interacting with AI systems

As part of the update process focusing on citizens interacting with AI systems, the requirements gathering captured the following:

KNOWLEDGE
- To be aware of what AI systems do and what they do not do
- To understand the benefits, limitations and challenges of AI systems

SKILLS
- To use, interact and give feedback to AI systems as an end-user
- To configure, supervise and adapt AI systems (e.g. overwrite, tweak)

ATTITUDES
- Human agency and control
- Critical yet open attitude
- Ethical considerations of usage



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Independent Expert, Finland

Speaker
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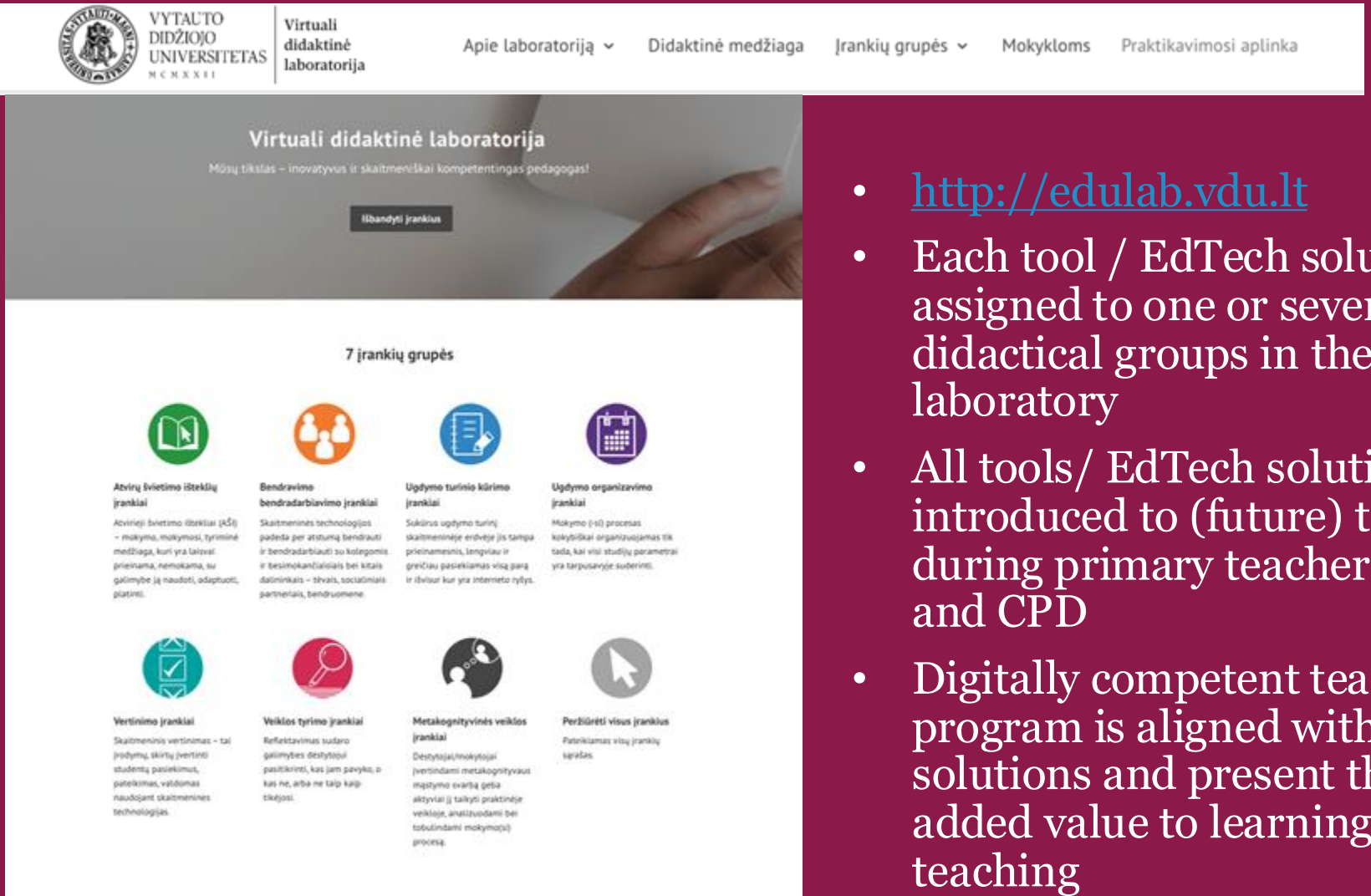
Knowledge Lab, University College London, United Kingdom



- http://edulab.vdu.lt
- Each tool / EdTech solution is assigned to one or several didactical groups in the virtual laboratory
- All tools/ EdTech solutions are introduced to (future) teachers during primary teacher training and CPD
- Digitally competent teacher program is aligned with EdTech solutions and present their added value to learning and teaching

What is the aim of using AI in teaching and learning?

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How does the data received from AI contribute to the competence targeted by the learner?

Who learns and who demonstrates new knowledge, skills and attitudes?
If this is AI, then who I am?

AI in Research in Education

Prof. dr. Airina Volungevičienė

Professor in Education, Education Academy

Director of the Institute for Study Innovations

Director || MB member at EDEN Digital Learning Europe

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