

Enhancing AI literacy among educators

A piloting study

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INFINITE

AI in Higher Education

INFINITE aims to prepare Higher Education (HE) instructors to critically and ethically exploit AI-based technology for their professional and pedagogical practices

Context



INFINITE
AI in Higher Education

Raise awareness about the affordances and challenges of AI for stimulating innovative professional and pedagogical practices

Develop hands-on resources for HE academics

Build HE academics' and students' digital competences, readiness and resilience to effectively use AI with ethical responsibility and integrity, for teaching, learning and assessment

Problematization - AI and its growing influence on education

AI is advancing rapidly



Many companies have introduced new 'Educational AI tools'

Problematization - AI and its growing influence on education

AI is advancing rapidly



Many companies have introduced new 'Educational AI tools'

Intelligent tutoring
systems

Specialized
chatbots

Automated
assessments tools

Problematization - AI and its growing influence on education

AI is expanding into many areas, including education

Problematization - AI in education: Opportunities and risks

Opportunities

- AI *enables(?)* personalized learning experiences.
- *Provides(?)* instant feedback to students.
- Offers valuable insights into student learning behaviors.

Risks

- Over-dependence on AI could diminish students' critical thinking skills.
- There are privacy concerns due to the significant data required for AI operations

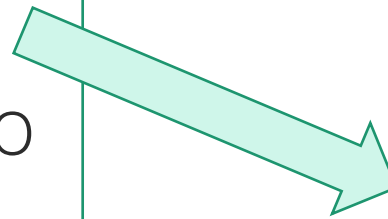
Problematization - AI in education: Opportunities and risks

Opportunities

- AI *enables(?)* personalized learning experiences.
- *Provides(?)* instant feedback to students.
- Offers valuable insights into student learning behaviors.



Which learning theories are behind the so called personalized learning experiences?



Which kind of feedback are providing these tools?

Problematization - Challenges for educators in adopting AI

Educators

They encounter significant difficulties/barriers when trying to integrate AI

Hesitancy in adopting AI due to trust issues, misconceptions and negative attitudes towards AI

Anxiety due to a perceived lack of knowledge to effectively use AI

Concerns about how to use it in a critical and ethical way

Problematization - Gaps

Gap 1: Most programs designed to develop AI-related skills have primarily targeted students in higher education, neglecting the needs of teachers in this sector

Gap 2: When such courses have been developed, they have often adopted a techno-positivist perspective, focusing heavily on the technical aspects of AI systems while giving limited attention to their ethical, legal, and social implications

Problematization - Objective


The objective of this research is to develop a workshop aimed at empowering HE educators with AI-related skills, emphasizing practical experience, ethical awareness and responsible AI use to address the growing demand and challenges in integrating AI within educational institutions

Problematization - Objective and research questions

The objective of this research is to develop a workshop aimed at empowering HE educators with AI-related skills, emphasizing practical experience, ethical awareness and responsible AI use to address the growing demand and challenges in integrating AI within educational institutions

Research question 1:

What impact does targeted professional development intervention have on educators' perceived usefulness, perceived ease of use, attitudes, and behavioral intentions towards AI?




Problematization - Objective and research questions

The objective of this research is to develop a workshop aimed at empowering HE educators with AI-related skills, emphasizing practical experience, ethical awareness and responsible AI use to address the growing demand and challenges in integrating AI within educational institutions


Research question 1:

What impact does targeted professional development intervention have on educators' perceived usefulness, perceived ease of use, attitudes, and behavioral intentions towards AI?



Research question 2:

What are the strengths and weaknesses of the current AI literacy workshop for educators and how can we improve it for the future?



Theoretical framework

Critical AI literacy

**Learning theory behind the workshop
design**

Theoretical framework

Critical AI literacy

Critical AI literacy is defined as the set of competences and dispositions that enable students and instructors to evaluate, communicate and collaborate with AI technologies critically and responsibly

Theoretical framework

Critical AI literacy

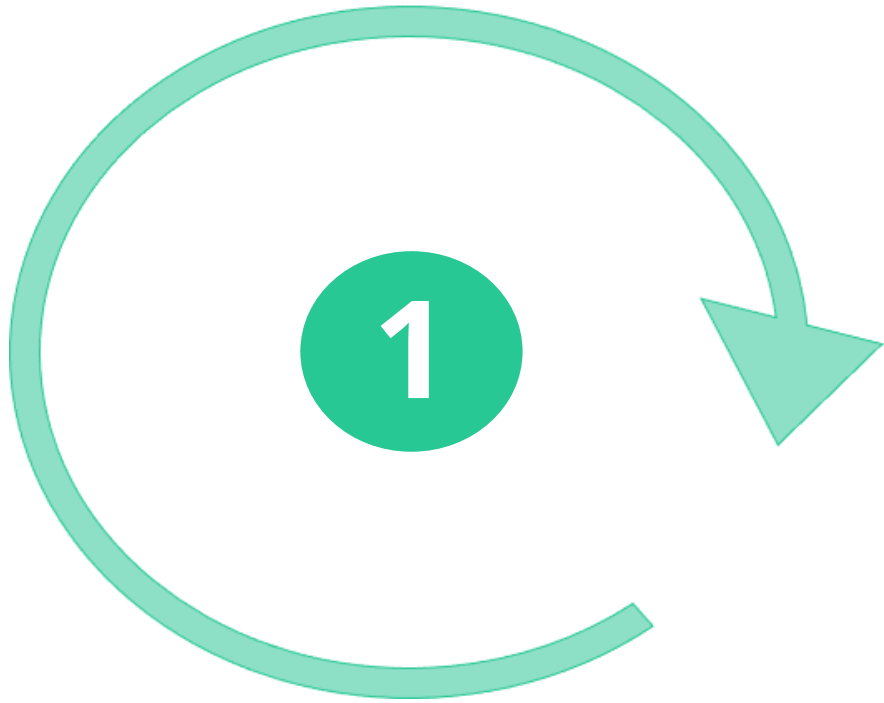
Critical AI literacy is defined as the set of competences and dispositions that enable students and instructors to evaluate, communicate and collaborate with AI technologies critically and responsibly

Developing technical knowledge on genAI systems that allows understanding on how data is processed and retrieved

Evaluating the impact of AI systems in academic activities balancing its strengths and dangers

Theoretical framework

Learning theory behind the workshop design



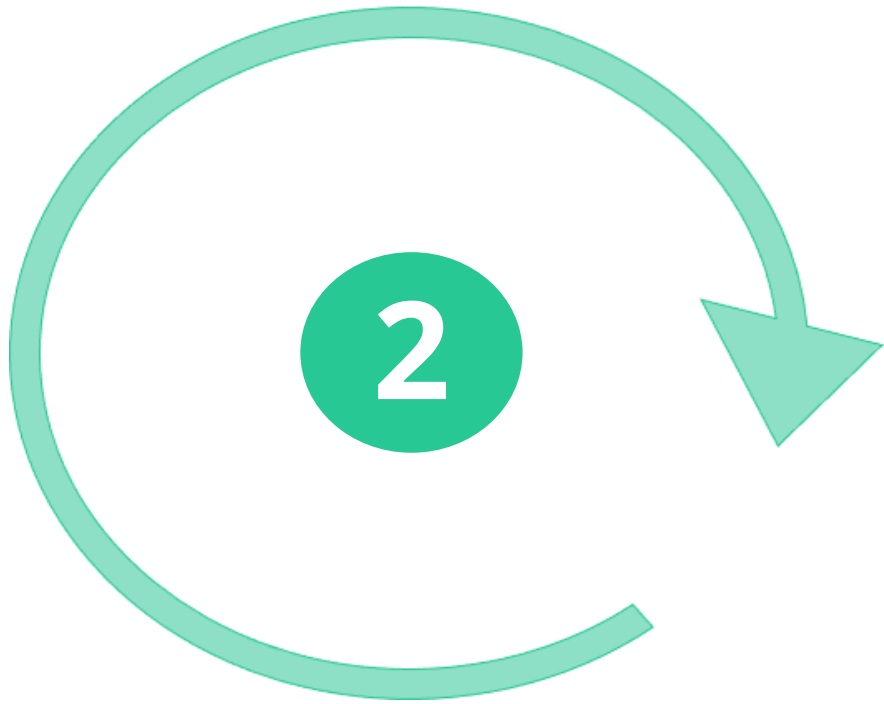
Learning cycle - (Jorba & Sanmartí, 1994)

Exploratory activities

- **Goal:** To allow students to identify and express their current understanding of a problem or topic.
- **Explanation:** These activities help teachers understand the starting point of each student's knowledge and encourage students to recognize that they may have different viewpoints from one another.

Theoretical framework

Learning theory behind the workshop design



Learning cycle - (Jorba & Sanmartí, 1994)

Concept/procedure introduction activities

- **Goal:** To introduce new concepts or ways to solve the problem.
- **Explanation:** These activities help students relate new ideas to their previous knowledge and give them tools to approach the problem in a new way, helping them form clearer definitions of concepts.

Theoretical framework

Learning theory behind the workshop design



Learning cycle - (Jorba & Sanmartí, 1994)

Knowledge structuring activities

- **Goal:** To help students organize their knowledge in their own way.
- **Purpose:** Students synthesize the information themselves. This individual effort to express knowledge ensures that students make the learning their own, rather than just repeating the ideas of others.

Theoretical framework

Learning theory behind the workshop design



Learning cycle - (Jorba & Sanmartí, 1994)

Application activities

- **Goal:** To apply new knowledge in different contexts.
- **Explanation:** These activities give students the chance to use what they've learned in real-world situations or new problems.

Context of the study

- Mixed-methods study and convenience sample (based on the availability of time and cases).

Methodology

Context of the study

- Mixed-methods study and convenience sample (based on the availability of time and cases).

Data gathering

Quantitative:

- A pre- and post-workshop survey was administered before and after the educators participated in the workshop.

Methodology

Category	Question	Code
Perceived usefulness	Using artificial intelligence in my job would enable me to accomplish tasks	PU1
	Using artificial intelligence would improve my job performance	PU2
	Using artificial intelligence in my job would increase my productivity	PU3
	Using artificial intelligence would enhance my effectiveness on the job	PU4
	Using artificial intelligence would make it easier to do my job	PU5
	I would find artificial intelligence useful in my job	PU6
Perceived ease of use	Learning to work with artificial intelligence would be easy for me	PEU1
	I would find it easy to get artificial intelligence to do what I want it to do	PEU2
	My interaction with artificial intelligence would be clear and understandable	PEU3
	I would find artificial intelligence to be flexible to interact with	PEU4
	It would be easy for me to become skilful at using artificial intelligence	PEU5
	I would find artificial intelligence easy to use	PEU6
Attitudes	I hesitate to use artificial intelligence for fear of making mistakes I can't correct*	A1
	I don't feel apprehensive about using artificial intelligence	A2
	Artificial intelligence makes me feel uncomfortable*	A3
	Using artificial intelligence does not scare me at all	A4
	I hesitate to use artificial intelligence in case I look stupid*	A5
Behavioural intentions	I would avoid taking a job if I knew it involved working with artificial intelligence*	BI1
	I avoid coming into contact with artificial intelligence at my job*	BI2
	I only use artificial intelligence at my job when I am told to*	BI3
	I will use artificial intelligence regularly in my job	BI4

- The survey was adapted from previous research (Davis, 1989; Marzilli et al., 2014; Teo, 2008).
- It consisted of 21 Likert-type statements.
- Responses to Likert-type scale questions were scored from one to five, with “strongly disagree” assigned a score of one and “strongly agree” assigned a score of five.
- The statements were categorized into 4 different themes

Methodology

Context of the study

- Mixed-methods study and convenience sample (based on the availability of time and cases).

Data gathering

Quantitative:

- A pre- and post-workshop survey was administered before and after the educators participated in the workshop.

Qualitative:

- For the post- workshop survey, open-ended questions were included.

Methodology

Category	Question	Code
Positive aspects	Which specific activities or exercises did you find particularly helpful or engaging? If yes, please explain why.	PA1
	Were there any specific topics covered in the workshop that you found especially interesting or insightful? If yes, please explain why.	PA2
Improvements	Were there any activities or exercises that you felt were unnecessary or ineffective? If yes, please explain why.	I1
	Were there any aspects of the workshop that you found confusing or unclear? If yes, please explain why.	I2
	Were there any areas where you felt the organization of the workshop could have been improved? If yes, please explain why.	I3
Extra	Is there anything you would like to share still?	E1

- The open-ended questions were adapted from Hoover-Dempsey et al. (2002) and Dori & Barnea (1997).
- It consisted of six open-ended questions.
- The open-ended questions were categorized into 3 different themes: positive aspects, improvements and extra.

Data analysis

Quantitative:

- We utilised two-tailed paired-sample t-tests to evaluate the workshop's influence on AI-related perceptions, including perceived usefulness, perceived ease of use, attitudes, and behavioural intentions.

Qualitative:

- Data collected from the open-ended-question survey underwent thematic analysis using an inductive content analysis approach, where themes are not predetermined but emerged from the data itself.

Results

Pre-post workshop survey - Quantitative

What impact does targeted professional development intervention have on educators' perceived usefulness, perceived ease of use, and attitudes towards AI?

Results

Pre-post workshop survey - Quantitative

Perceived usefulness

- AI was rated as useful both before and after the workshop, with a slight increase in ratings following the workshop.
- After the workshop, most of the participants expressed a stronger belief that AI could improve their job productivity.
- There was an increased recognition that AI could help accomplish more tasks effectively.
- The workshop reinforced the perception of AI as a valuable tool in participants' professional roles.

Overall, views on AI's usefulness were positive, showing its potential impact in the workplace.

Results

Pre-post workshop survey - Quantitative

Perceived ease of use

- A significant improvement in the perceived ease of use was observed after the workshop, shifting from neutral to more positive views on AI usability.
- Participants showed more agreement that AI is easy to learn and flexible to work with.
- The workshop helped participants find AI easier to use for specific tasks.
- Many participants felt that becoming skilled at using AI seemed more achievable after the workshop.
- Some participants also found their interaction with AI to be clearer and more understandable post-workshop.

Overall, the workshop contributed to a greater sense of ease in using AI, though views on usability varied among participants.

Results

Pre-post workshop survey - Quantitative

Attitudes towards AI

- There was a slight shift towards more positive attitudes toward AI, though this change was not statistically significant.
- Participants showed a mix of reactions, with some holding more positive views and others remaining skeptical.
- A reduction in fear of using AI and less hesitation due to fear of making mistakes was observed after the workshop.
- Several participants reported feeling more comfortable using AI after the workshop, but some still expressed concerns or apprehension.

Overall, attitudes toward AI varied, with both positive shifts and lingering doubts.

Results

Pre-post workshop survey - Qualitative

What are the strengths and weaknesses of the current AI literacy workshop for educators and how can we improve it for the future?

Results

Pre-post workshop survey - Qualitative

Helping or engaging exercises and activities

- **Prompt-building:**
 - Participants found the exercise on creating effective prompts highly engaging and useful.
- **Group discussions:**
 - Group discussions were seen as valuable, offering practical insights into prompt design and ethical considerations.
 - These discussions enhanced participants' engagement and understanding of real-world AI tools like ChatGPT.
- **Ethical issues in AI:**
 - Participants appreciated the focus on ethical concerns, particularly the risks of unethical practices like using data without consent.
 - These activities helped raise awareness about responsible AI use.

Results

Pre-post workshop survey - Qualitative

Unnecessary or ineffective activities or exercises

- **Large language models (LLMs):**
 - Some participants felt that the information on LLMs was unnecessary, as many were already familiar with the concept.
- **Activity depth:**
 - Feedback suggested that certain activities could have been more in-depth and explorative, allowing for deeper engagement.
- **General satisfaction:**
 - Most participants did not find any activities unnecessary or ineffective, reflecting overall satisfaction with the workshop.

Results

Pre-post workshop survey - Qualitative

Improvements regarding the workshop's organization

- **More time for prompt engineering:**
 - Participants suggested dedicating additional time to practicing prompt engineering, emphasizing the importance of hands-on learning.
- **Better-structured discussions:**
 - Some participants noted that discussions occasionally went off-topic, suggesting the need for more structured and focused conversations.
- **Incorporating Grading with LLMs:**
 - One participant suggested including an activity focused on using Large Language Models (LLMs) to assist with grading students' assignments.

Conclusions

- Overall, we observed improvements across the various aspects analyzed, including educators' perceived usefulness, perceived ease of use, attitudes, and behavioral intentions towards AI.
- Educators and instructors value the development of these programs, as some have expressed feelings of anxiety due to their self-perceived lack of knowledge, as previously mentioned.
- According to the educators, the strengths of the workshop included practical exercises, reflective activities, and group discussions.
- Ongoing improvements are necessary to further enhance AI literacy initiatives for educators.

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