



A New Serious Game to Strengthen Science-Society Dialogue Making Explicit Research Processes

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EDUCATION WITHIN THE OPEN-SCIENCE & POST-TRUTH ERA

POST-TRUTH ERA

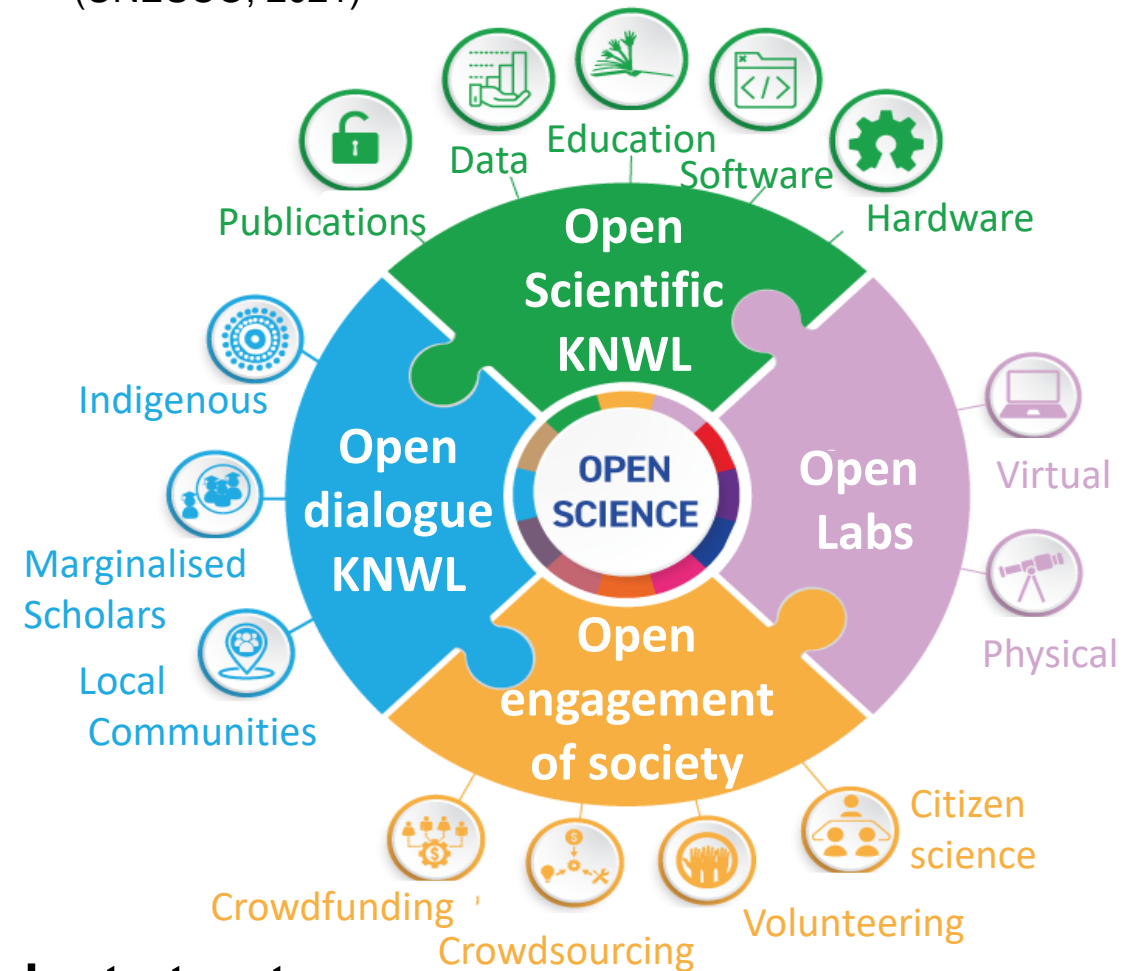
(McIntyre, 2018)



Truth	Post-truth
I think therefore I am	I believe therefore I'm right!
	
	shovel

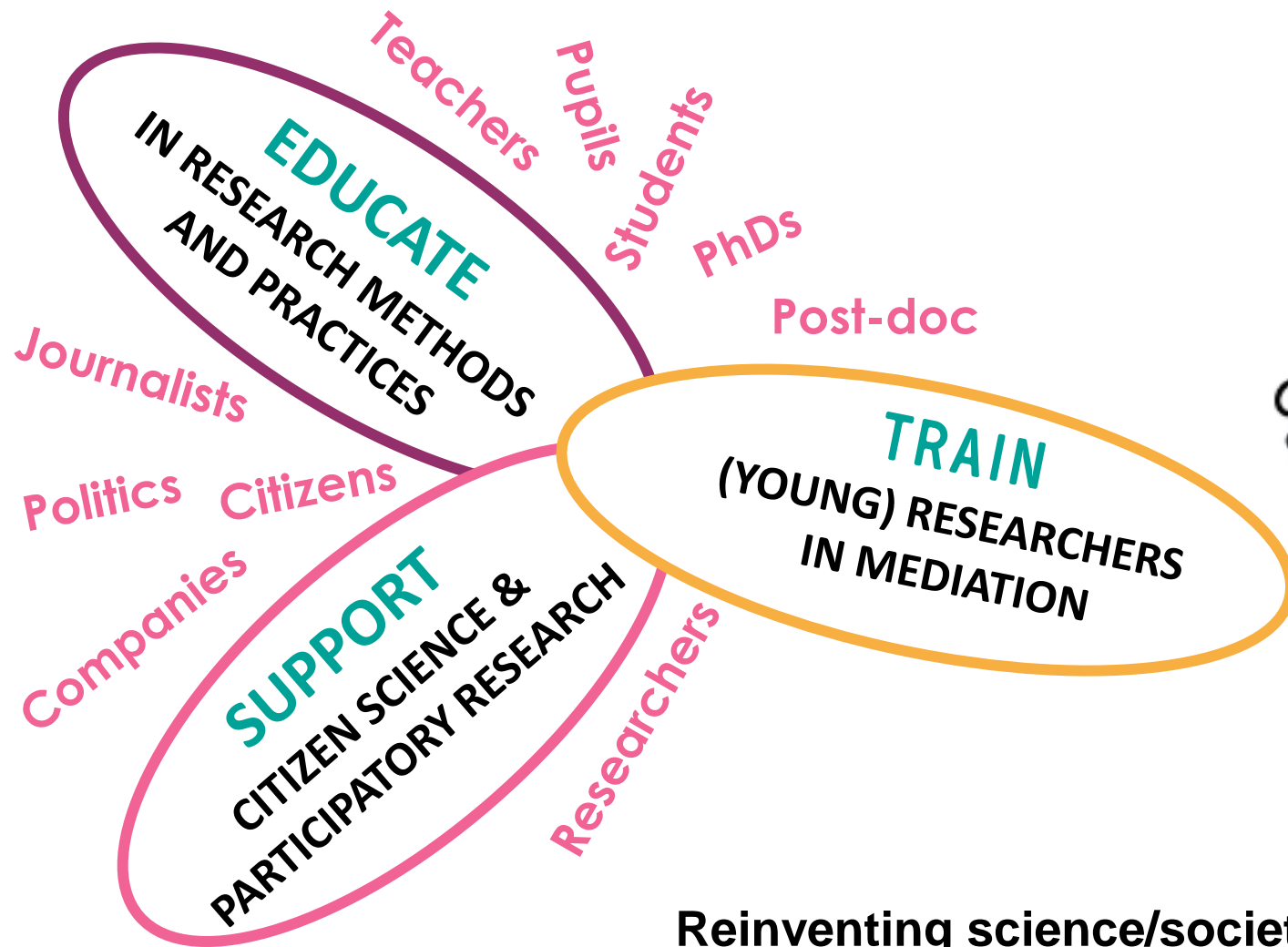
OPEN SCIENCE

(UNESCO, 2021)



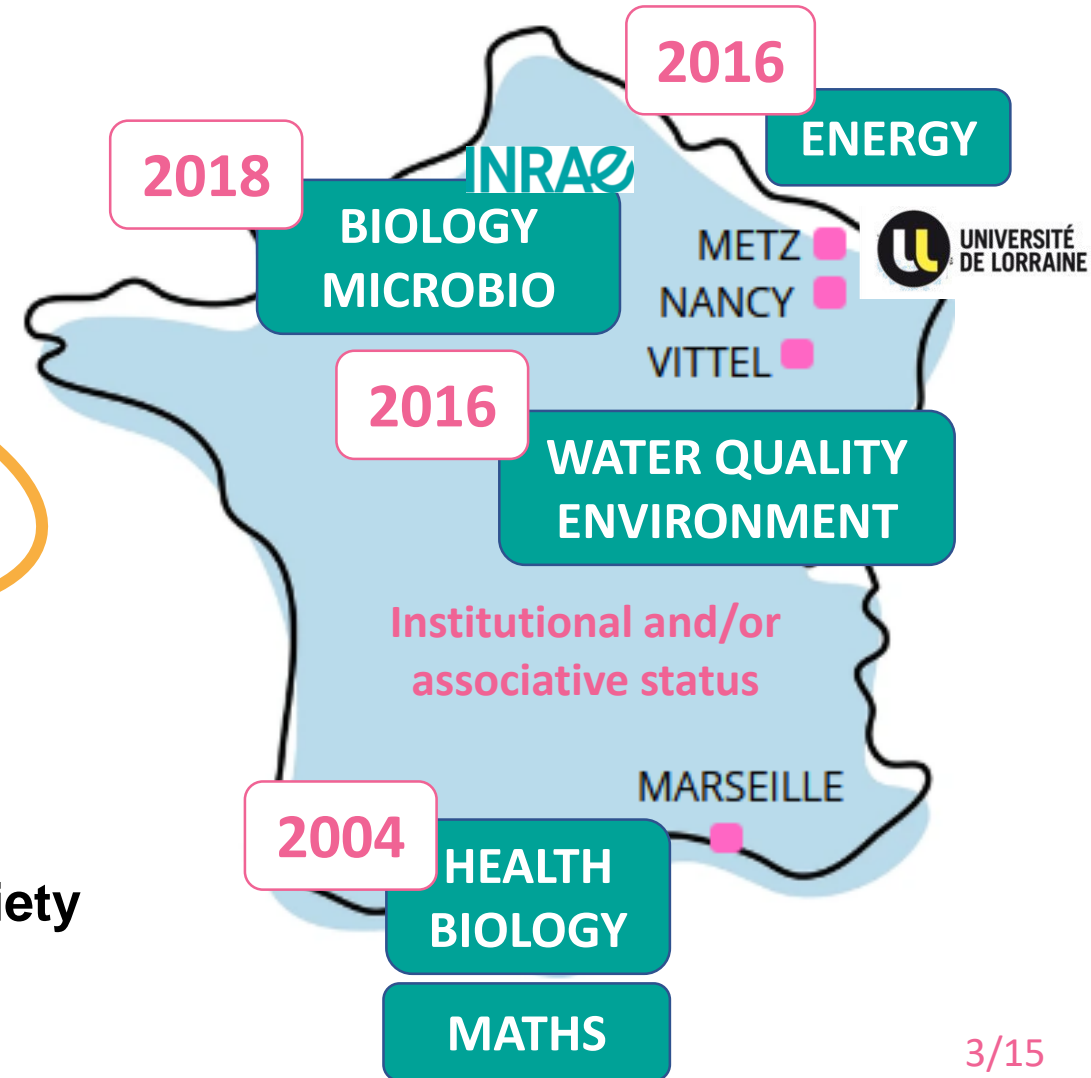
- Confusion over what is known, how to know, who to trust
- Lack of education in research approaches and methods

« TOUS CHERCHEURS »: OPEN-LIVING-LABS FOR ALL



Reinventing science/society relationships

A NATIONAL NETWORK



EVOLUTIVE OPEN INFRASTRUCTURES TO EXPERIENCE RESEARCH

LABORATORIES



Safe access to scientific equipments



EXPERIMENTAL FIELD SITES

Situated learnings



WORK SPACES

Co-building questions & analysis



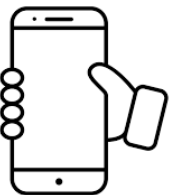
CONVIVIALITY AREAS

Dialogue facilitation



DIGITAL TOOLS

Crowdsourcing & data visualization application



« TOUS CHERCHEURS »: RESEARCH WITH AND FOR ALL



NUMBER OF PARTICIPANTS TO DATE

- + 9 500 secondary pupils
- + 2 600 citizens from 10 to 85 years old
- + 190 young researchers
- + 50 associations
- + 30 laboratories, public institutions, companies

VALUES

CRITICAL THINKING
INCLUSIVITY
INTERDISCIPLINARITY
KNOWLEDGE DIALOGUE



Third-places
rooted in **academic spheres**

ACTIVE PEDAGOGIES TO STEP INTO « SCIENCE-IN-THE MAKING »

SCIENTIFIC TUTORS



PhDs, Post-doc, scientists

Ensure scientific rigor
Encourage questioning



Real research conditions
On-going researches



IMMERSION 2-3 days



LEARNING
-BY-
DOING



Small groups (5 -8 pers.)
Skills sharing
Dialogue

Problem-solving
unknowing the answer
(Hammond et al, , 2010)



COLLABORATIVE TEAMS

All class or citizens

INQUIRY

GOING THROUGH ALL THE STAGES OF A SCIENTIFIC PROCESS

1.

PROBLEMATISATION

Contextualising

Formulating questions

Proposing an approach



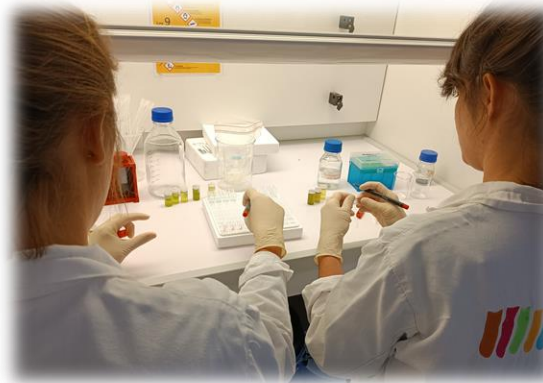
2.

EXPERIMENTATION

Handling

Observing/ Measuring

Recording data



3.

ANALYSIS

Data processing

Analising results

Interpretating results



4.

DISCUSSION

Formalising

Presenting (oral)

Discussing



EXPLI'CIT : HOW SCIENTIFIC KNOWLEDGE IS BUILT UP ?

PARTICIPATORY RESEARCH

Question formulation ○

Collaboration steps ○

Result quality ○

Meeting scientists ○

Type of questions & answers ○

Scientific culture ○

Getting information ○

Experimental approaches ○

MEDIATION & TRAINING

ACADEMIC RESEARCH

○ Interdisciplinarity

○ Epistemology

○ Reflexivity

○ Dialogue

○ Critical thinking

○ Methods

○ Language

○ Science jobs

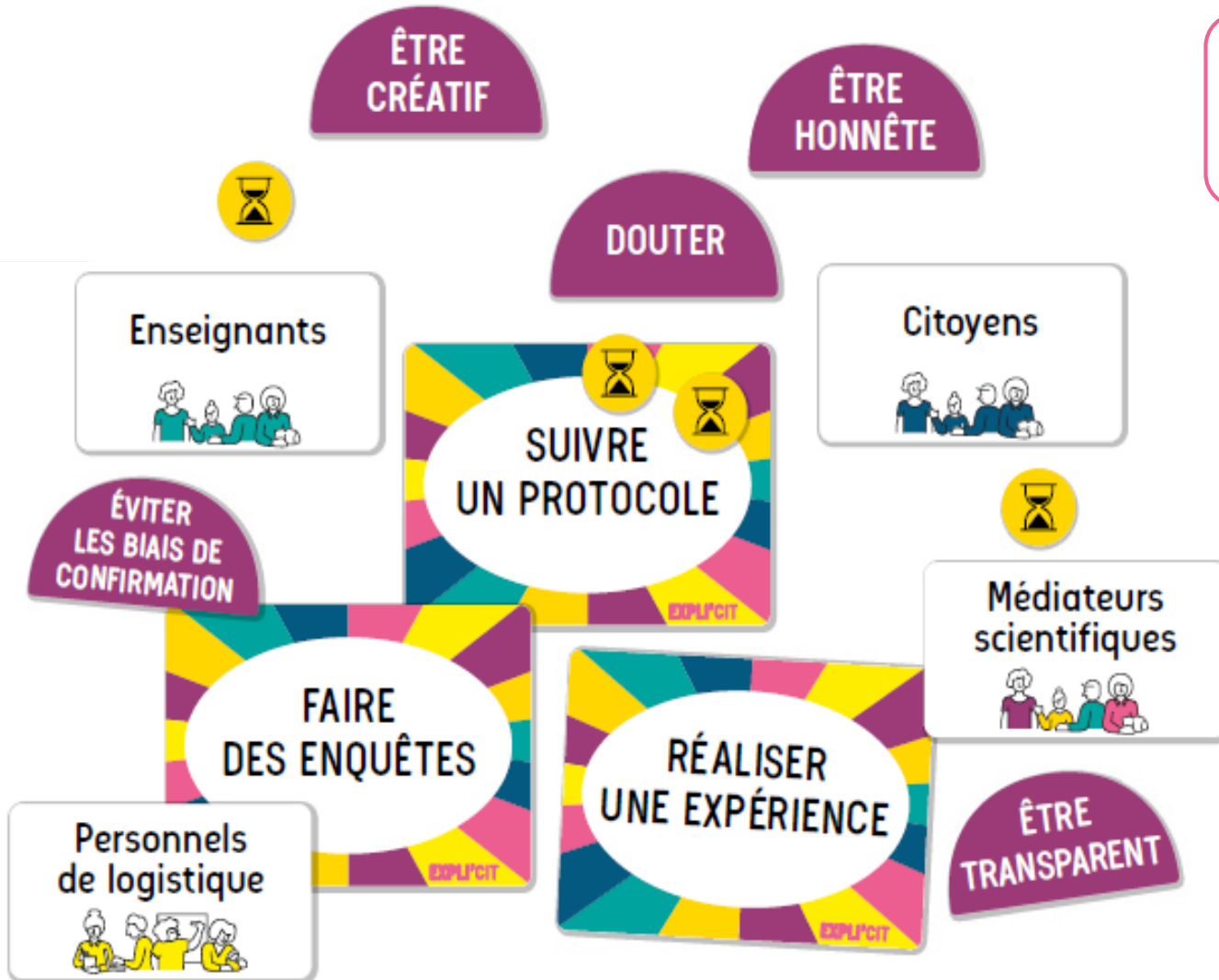
SCIENCE EDUCATION



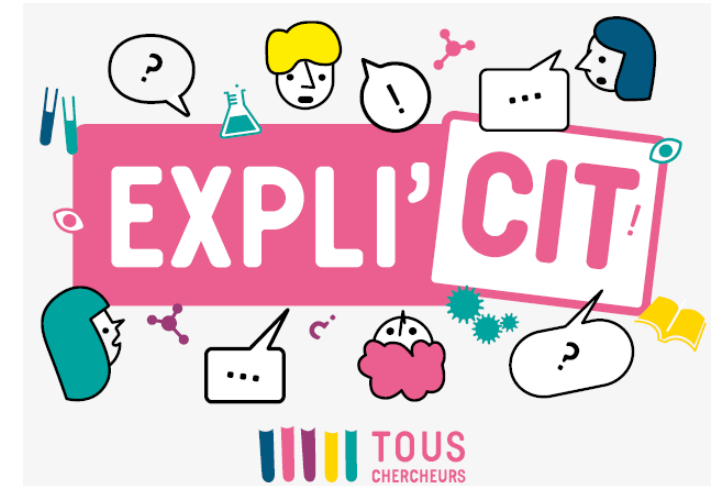
WHAT THE GAME IS MADE OF ?

A CONTINUOUS DESIGN-IN-USE (2020-2023)

Step-by-step improved during 40 test sessions



118
MAGNETS



- Research process stages (37 items)
- Values & ethics (11 items)
- Knowledge actors (10 figures)
- Jobs in research (13 figures)
- Hourglass tokens (30 pieces)

- Quick start instruction
- Guide booklet (70 pages)



THE ORIGIN OF THE GAME : EXPRESS VIEWS ON RESEARCH

HOW RESEARCH WORKS AND WHAT RESEARCHERS DO ?



Helping a group of non-French-speaking secondary school pupils to share their views on research and researchers



20 key words on pieces of paper on the board

A CONSENSUAL GENERIC AND INTERDISCIPLINARY THESAURUS

37 TERMS TO EXPLICIT AND ILLUSTRATE RESEARCH ACTIVITIES

**KNOWLEDGE
SHARING**

EXPLI'CT

**FORMULATING
AN HYPOTHESIS**

EXPLI'CT

**ASKING A NEW
QUESTION**

EXPLI'CT

**ANALYSING
RESULTS**

EXPLI'CT

**PEER
REVIEWING**

EXPLI'CT

**MAKE A
BIBLIOGRAPHY**

EXPLI'CT

EXPLI'CIT MODULAR SESSIONS IN 5 SEQUENCES

HOW TO PRODUCE (NEW) SCIENTIFIC KNOWLEDGE ?

Making visible the intellectual, social, technical and material pathways



4 to 8
participants



1 scientific
mentor



1 game KIT
Or Print & Play



Workshops
30 min to ½ day

- 1) How to organise the different stages of a **research process** ?
- 2) What are the **attitudes, values and ethics** behind a research work ?
- 3) What are the **timeframes** for the different stages of a research project ?
- 4) Who are the different **actors** involved to produce scientific knowledge ?
- 5) What are the different **jobs** in academic research ?

Express *Standard* *Expert*

30 min *1h* *2h30*

10 min *20 min* *1h*

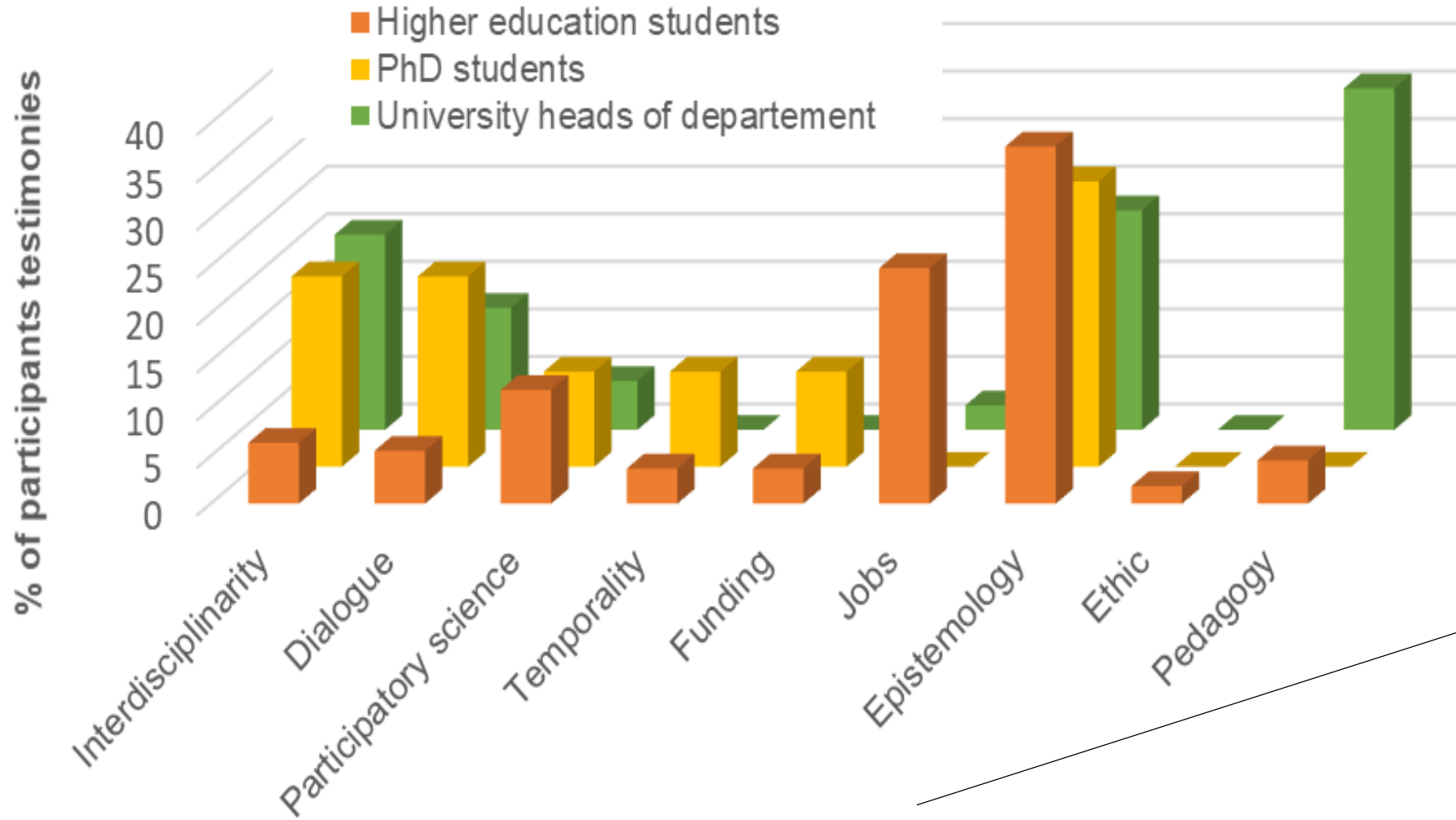
10 min *15 min*

20 min

20 min

A FIRST WINDOW ON PARTICIPANTS LEARNINGS

COULD YOU CITE 3 POINTS OF ASTONISHMENTS ABOUT THIS GAME SESSION ?



2023

Observant
participation

(notes, audio recordings,
photos, debriefings)



Focus on
Higher
Education

PARTICIPANTS IMMEDIATE OUTCOMES

“I asked myself new questions that I had never asked before.”

“It helped me going beyond the obvious.”








“I can see how I could use it in training.”

“I realized that there is real differences in thought structuring between disciplines.”

Marseille University heads of departments (June 2023)

CONCLUSION

EXPLI'CIT IS A NEW SERIOUS GAME THAT ALLOWS TO :

-  **Gain a better understanding of the reality of different research practices**
-  **Address inter/transdisciplinarity issues**
-  **Enhance critical thinking and epistemic vigilance**
-  **Support dialogue in hybrid groups with academics and non-academics**
-  **Sustain the development of participatory science & research**



Toward a democracy of knowledge

In the process of being protected



Distribution limited to prior training



THANK YOU FOR YOUR ATTENTION