



## SErious Game for AgroEcology (SEGAE): how much can be delivered with a 4-hour lesson?



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Mireille De Graeuwe & Kevin Maréchal





01

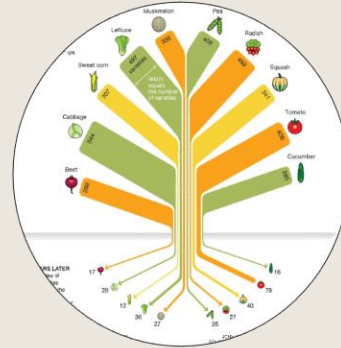
# Introduction



# Agricultural challenges



**Soil erosion**



**↓ Biodiversity**



**↓ Income**

Campbell et al. (2017)

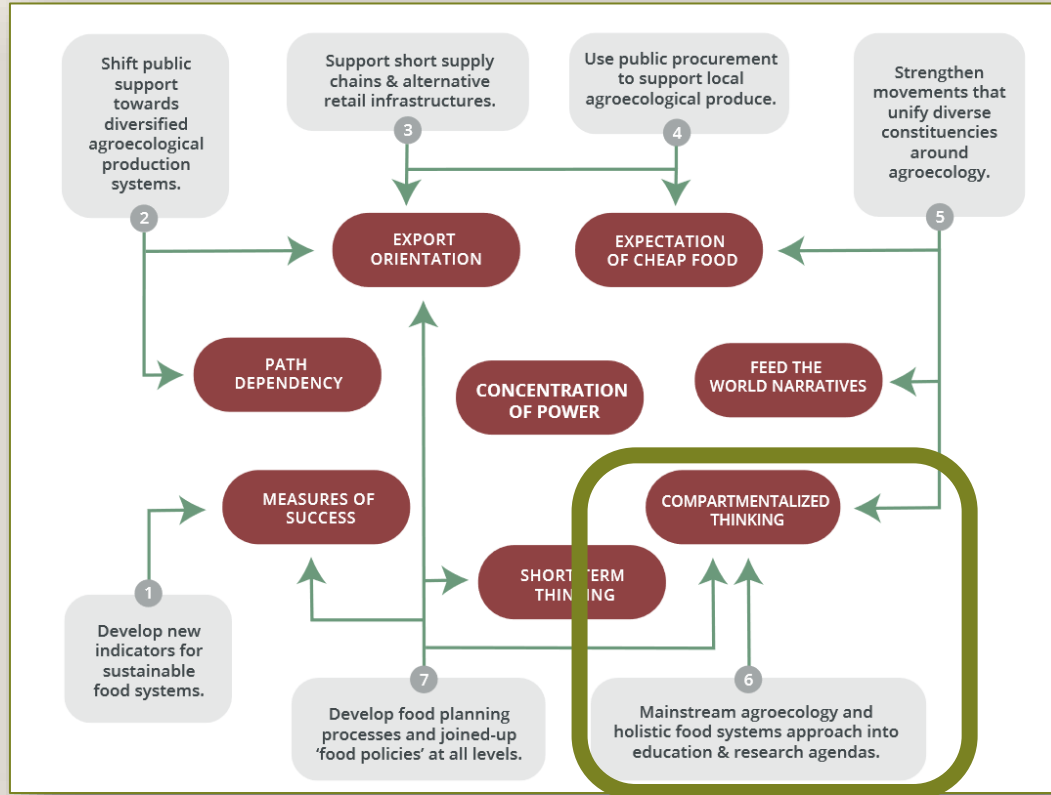
# Agroecology



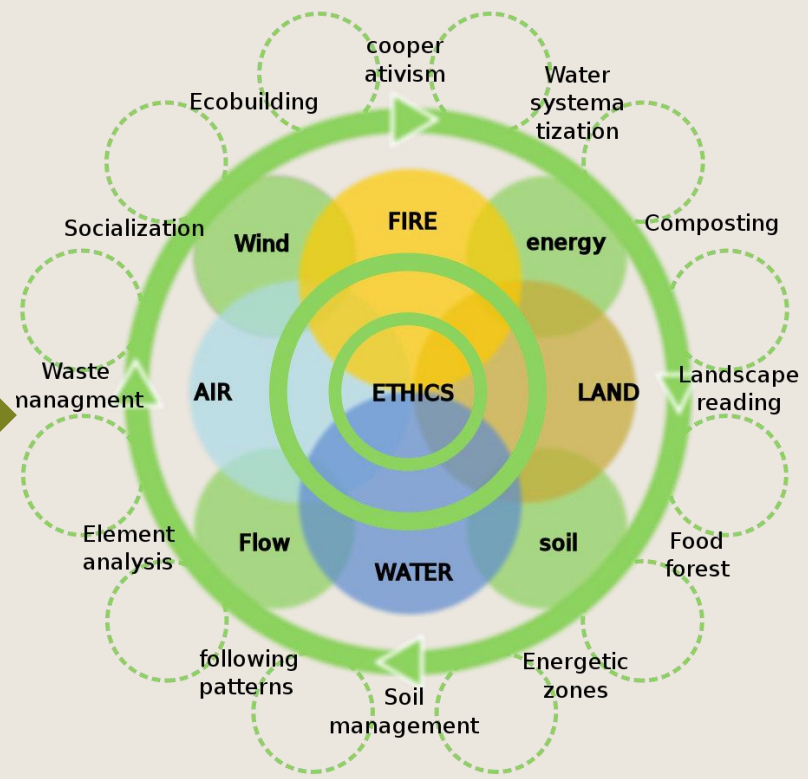
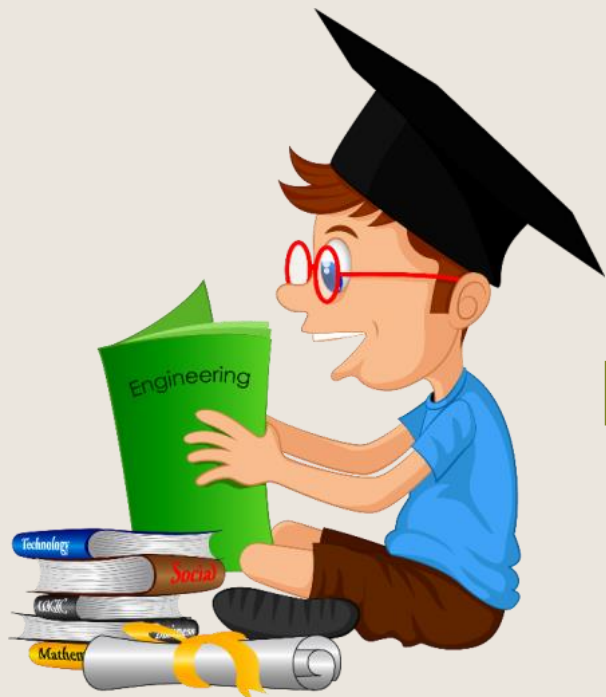
## The economic potential of agroecology: Empirical evidence from Europe

Van Der Ploeg et al (2018), *Journal of Rural Studies*

# Points for change



# Agroecology education



# Serious game



Entertaining tools with an education purpose

Digital tools allow the simulation of **complex** models

➤ ↑ Understanding of systems approaches (Wu & Lee, 2015)



Article

**Learning Interdisciplinarity and Systems Approaches in Agroecology: Experience with the Serious Game SEGAE**

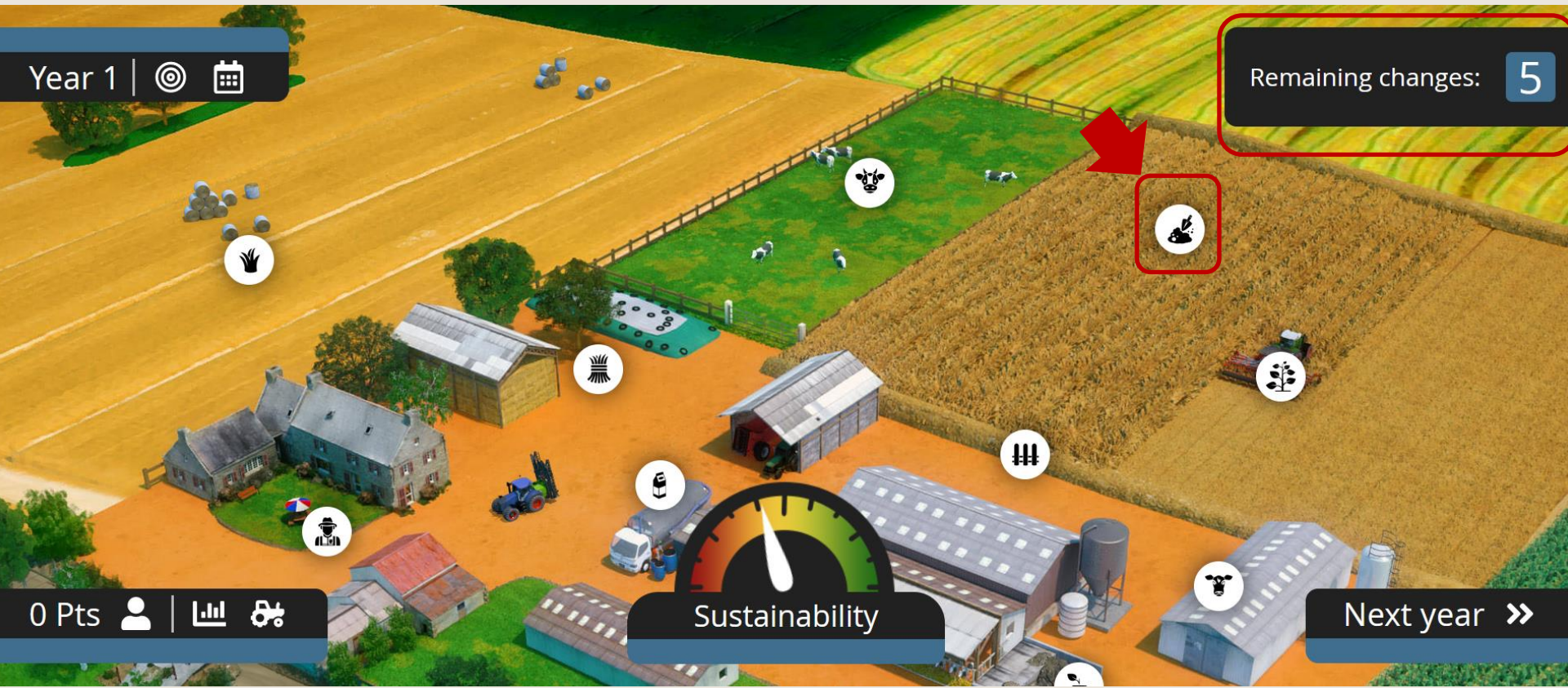




SERIOUS GAME  
**Segae**  
AGRO ECOLOGY

02

# Materials & Method



Year 1 | 🎯 📅

Remaining changes: 5

0 Pts 👤 📊 🚧

Sustainability

Next year >>



SOIL MANAGEMENT



Tillage management

Conventional tillage



Fuel consumption

122L / ha

*Crop production only*



Soil cover

Reduced tillage



Microbial biomass

5.43

*Grade: the higher, the better*



Residues management

No tillage



Soil meso-fauna & nematodes

0.87

*Biodiversity index: the higher, the better*



Earthworm abundance

4.14

*Grade: the higher, the better*



0 Pts



**SOIL MANAGEMENT** [Close]

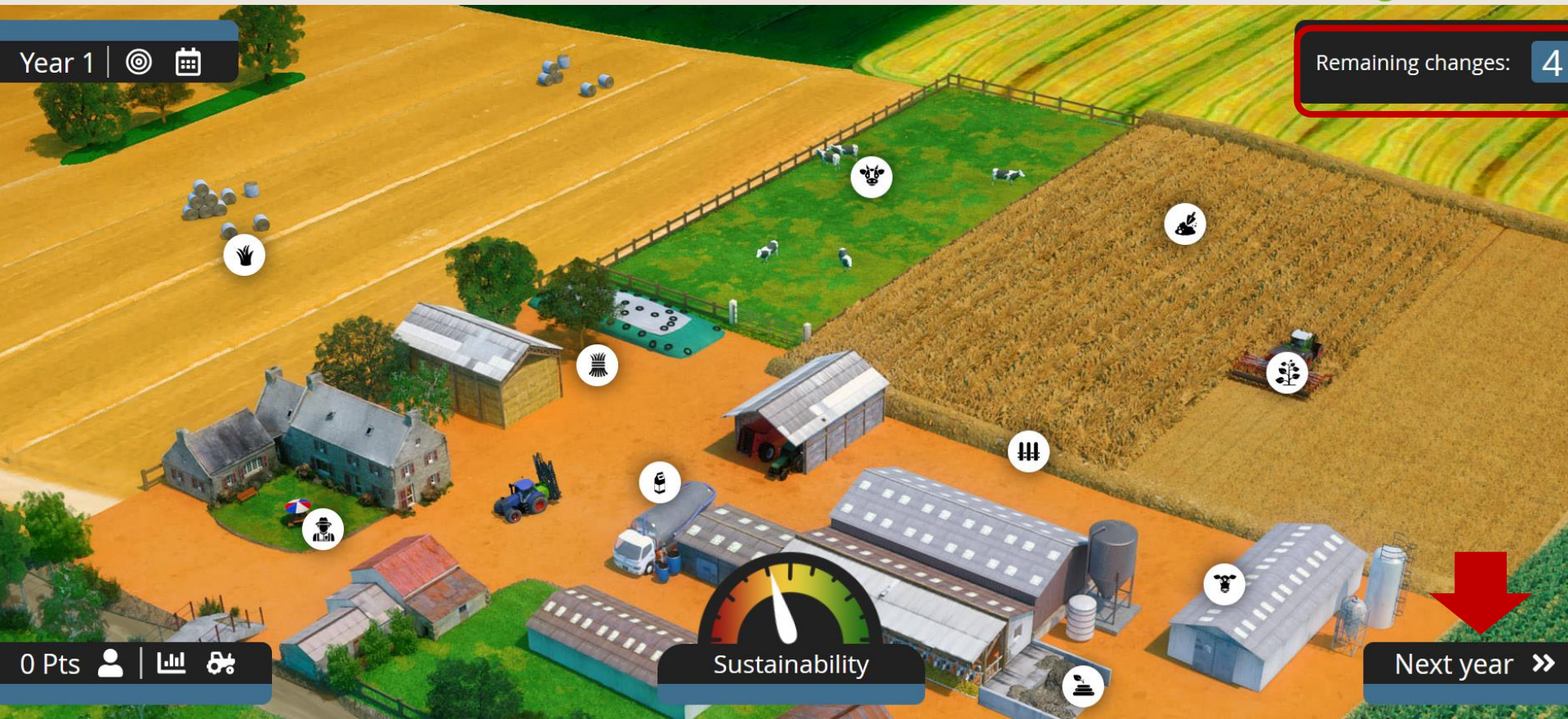
- Tillage management
  - Conventional tillage [Info]
  - Reduced tillage [Info]
  - No tillage [Info]**
- Soil cover
- Residues management

<b>Fuel consumption</b> <i>Crop production only</i>	122L / ha
<b>Microbial biomass</b> <i>Grade: the higher, the better</i>	5.43
<b>Soil meso-fauna &amp; nematodes</b> <i>Biodiversity index: the higher, the better</i>	0.87
<b>Earthworm abundance</b> <i>Grade: the higher, the better</i>	4.14

0 Pts [User] [Bar Chart] [Tools]


Year 1 |  

Remaining changes: **4**



0 Pts   

  
Sustainability

  
Next year >>

## Report: consequences of agricultural practices implemented in Year 1

« < NEW PRACTICES IMPLEMENTED IN YEAR 1 > »

No tillage



◇ Sustainability

Environment + Environmental sustainability: 0.43

+ Economic sustainability: 0.34

+ Social sustainability: 0.54

3449 Pts

Sustainability

Next year >>

# Lesson



Pre-survey

Theory

Game

Post-Survey



Profile  
Knowledge

Soil-Plant-Ecology  
Animal  
Socio-economic

Sandbox  
System approach  
Indicator oriented

Knowledge  
Feedback



# Sample

	Dates	Lesson Type	Knowledge part		
			Pre-survey	Post-survey	Matching*
<b>First lesson</b>	March 2021	<b>Online</b>	68	74	<b>48</b>
<b>Second lesson</b>	March 2023	Face-to-face	34	20	<b>20</b>
<b>Third lesson</b>	May 2023	Face-to-face	51	49	<b>42</b>
				<b>Total</b>	<b>110</b>



# Sample - Specializations

	Agronomy	Forest	International Development	Others
First lesson	16	17		15
Second lesson			20	
Third lesson	18	15		9
<b>Total</b>	<b>34</b>	<b>32</b>	<b>20</b>	<b>24</b>



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Results



# Knowledge

Knowledge score pre-survey



Number of books or scientific articles read

Knowledge score post -survey



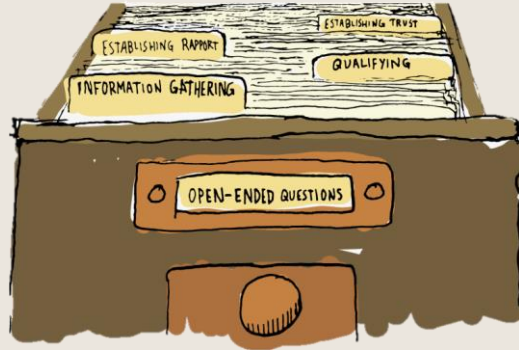
Knowledge score pre-survey

Type of lesson

# Knowledge



↗ 6 %



@ Stephen Bleakley

↗ 12 %

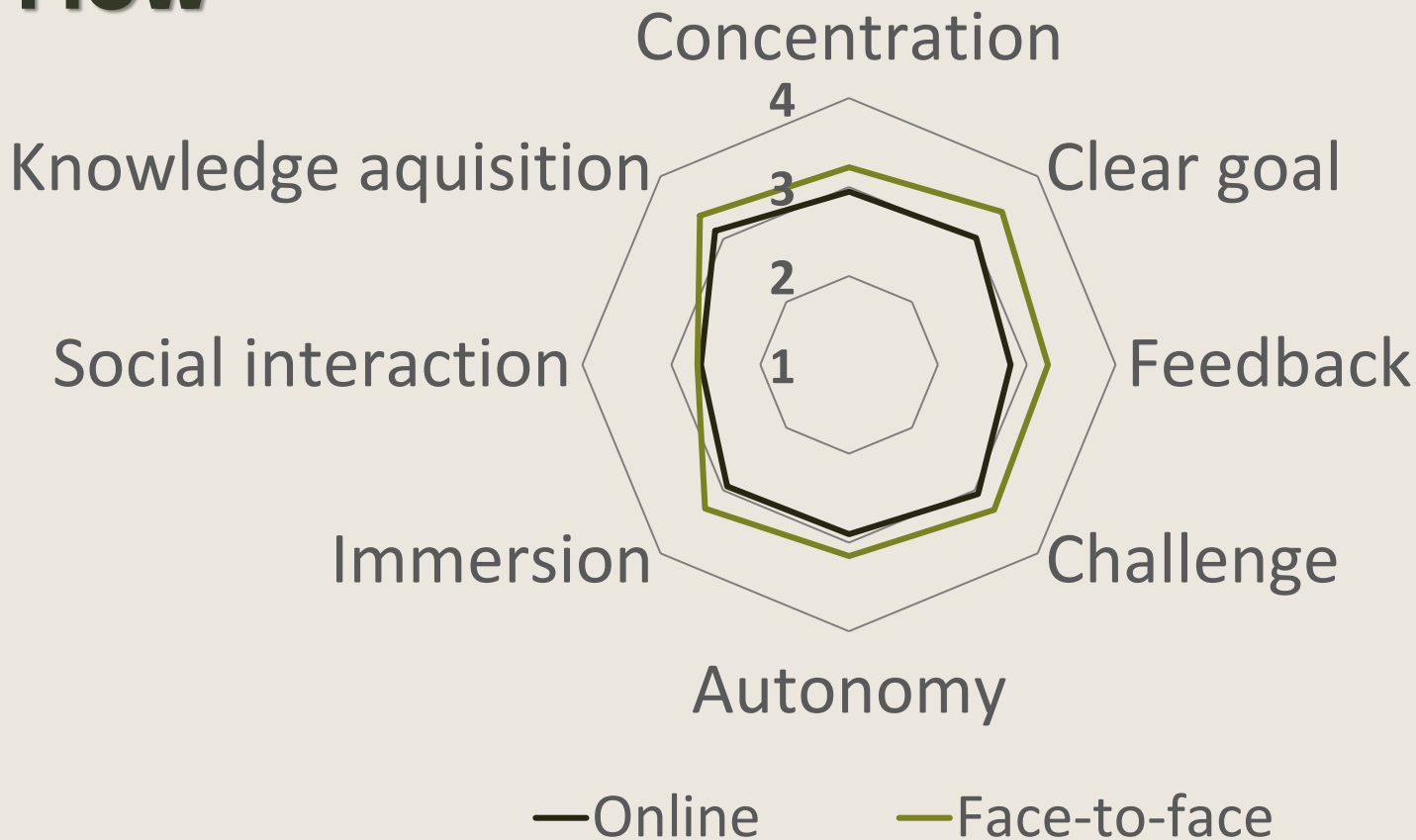
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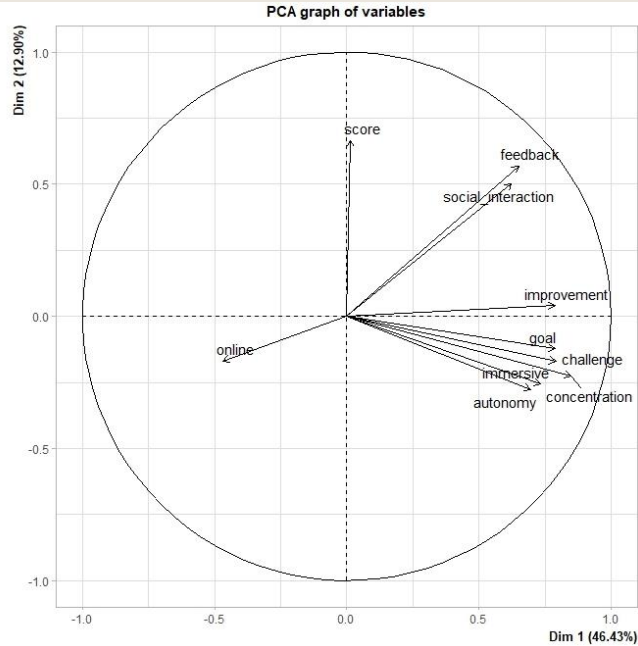
@ Studentacademy.be

↗ 3 %

# Flow



# Flow & knowledge



Absolute change  
for knowledge  
survey's



Feedback

Social-interaction



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04

# Discussion



# Results

 > 88% 

Gap between knowledge and action (*Østergaard et al., 2010*)

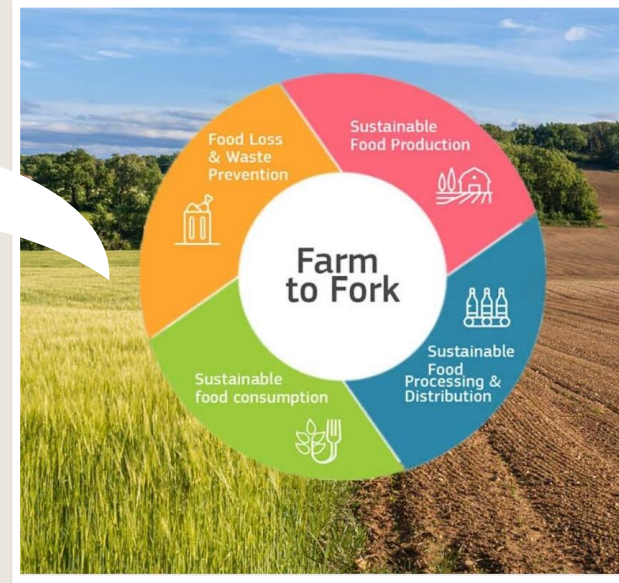
Immersion



# Prospects for coupling



Education

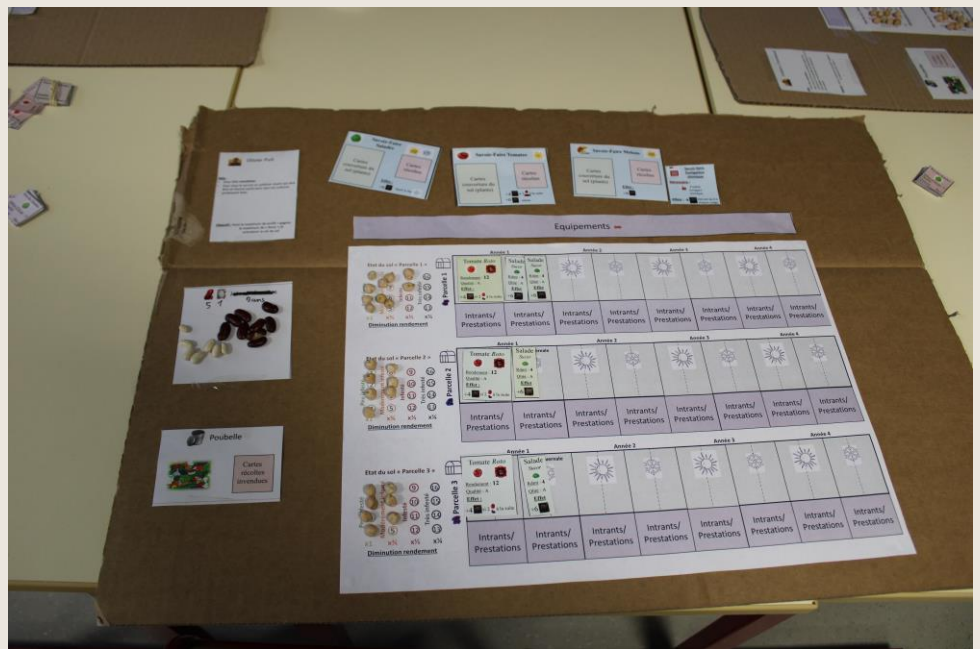
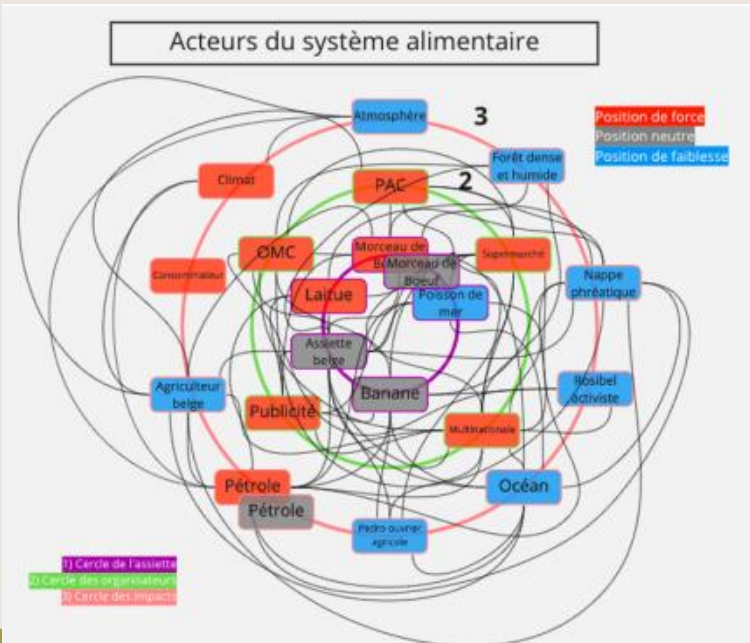


Food systems

# Prospects for coupling

(1) String game

(2) The game « Ssols&co »





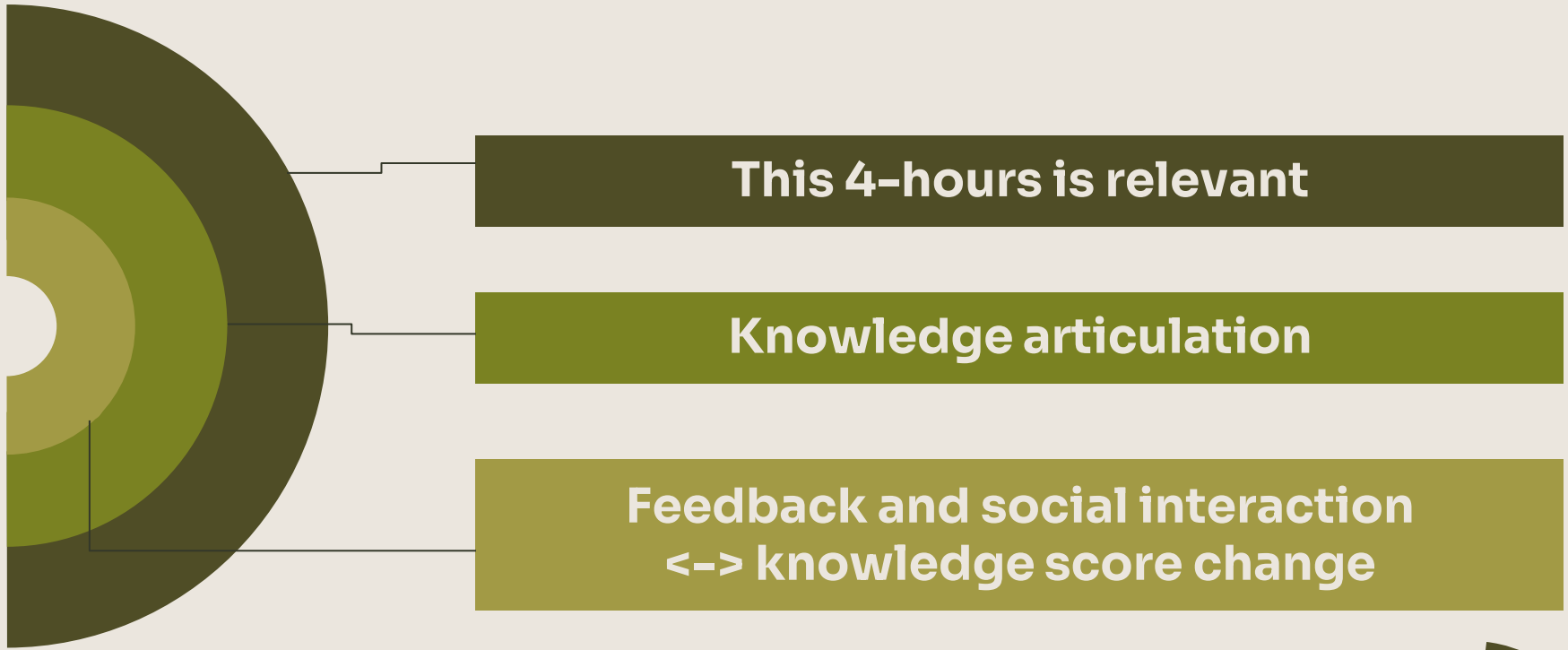
05

# Key messages





# Conclusion



# Thanks!

## Do you have any question?

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SEGAE Website :

<https://www.segae.org/game/>

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