

Characterizing the Players' Strategies and their Evolution:

A Case Study Based on Learning Analytics



E. Sanchez, N. Mandran, V. Emin, V. Fontanieu, C. Emin
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Context ?



A Challenge...

Designing a training session to teach the legal rules (*ie.* copyright) that comply with the policies for the use of digital resources in an educational context

- 242 Students
- Low Motivation
- Short Time
- Few trainers



TAMAGOCOURS



1. Choose an educational resource

2. Put it into the fridge

4. Feed the Tamagocours

3. Chat with your team



1 Choisissez une ressource pédagogique dans le garde-manger et placez-la dans le frigo.



2 Discutez sur le chat des ressources dans le frigo et des modes de diffusion choisis.



3 Nourrissez votre tamagocours avec les ressources sélectionnées. Observez l'effet sur les scores.

TAMAGOTEAM

Joe le capitaine

Joueur 2	Joueur 3
Joueur 4	Joueur 5

TAMAGOC

Serveur : bla bla bla
Joueur 1 : bla bla bla

Saisissez votre message

Envoyer

TAMAGOSCORES

Vie: 10 hearts

Énergie: 10 icons

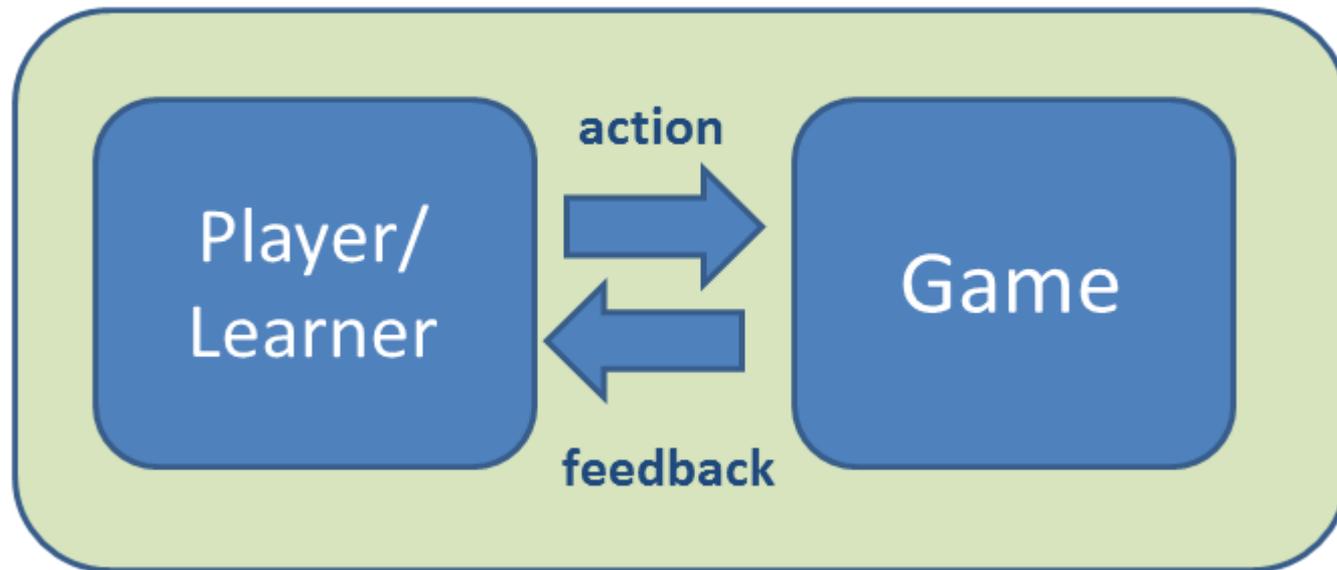
Score: 155

A Learning Game

Conceptual Framework ?

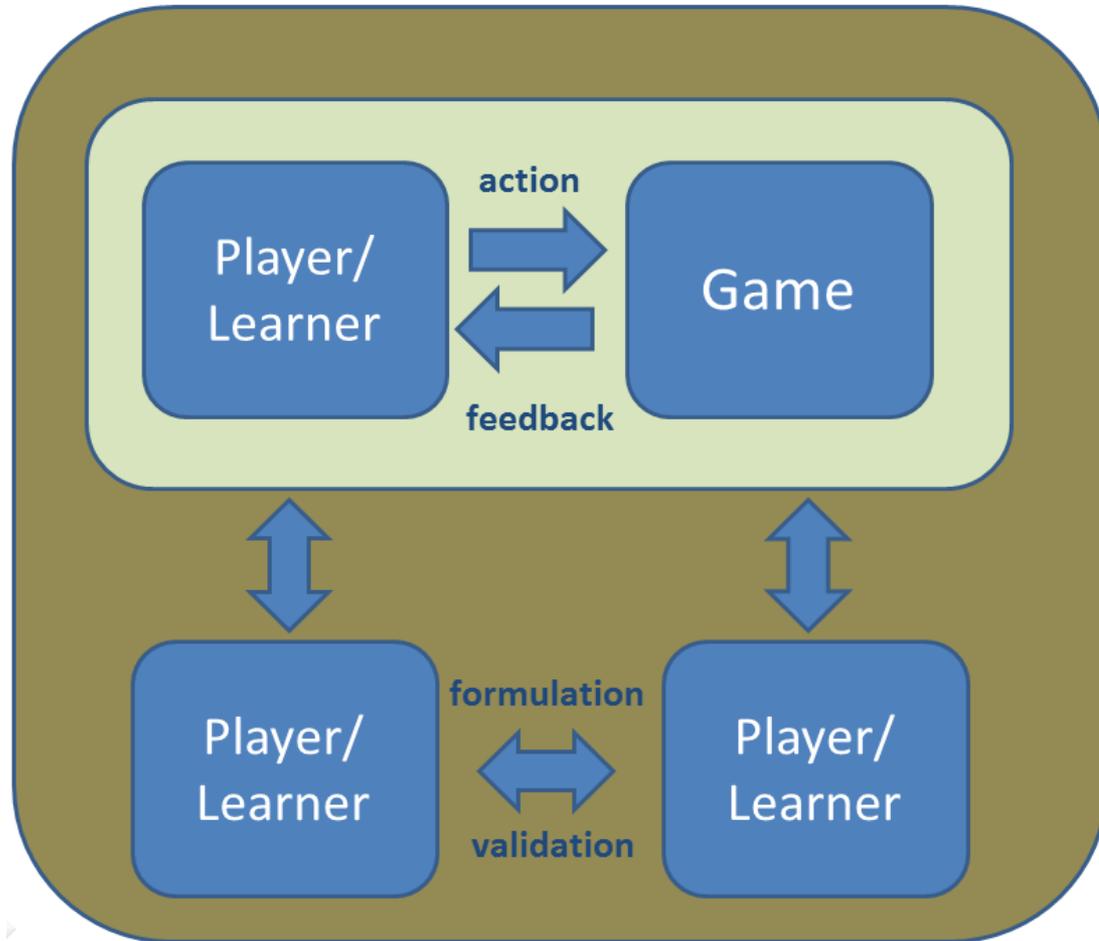


A First Layer of Play: Conflict



Brousseau, G. (1998). *Théorie des situations didactiques*. Grenoble: La Pensée sauvage.

A Second Layer of Play: Collaboration



Margolinas, C. (1995). La structuration du milieu et ses apports dans l'analyse a posteriori des situations. In C. Margolinas (Ed.), *Les débats de didactique des mathématiques* (pp. 89-102). Grenoble: La Pensée sauvage éditions.

Play 2 – Collaboration

- **Formulation (F)**

“No more than 4 pages of handbooks”

- **Validation (V):** hypothesis, questions, remarks

“From 1898 it should be in the public domain now”

- **Others (OJ)**

*“You could put something in the fridge?”,
“mium mium”,*



Research objectives

- What are the strategies performed by the students and to what extent are these strategies linked with the expected learning outcomes?
- How do these strategies evolve among time and does this evolution favor learning?

Methodology?



An empirical study

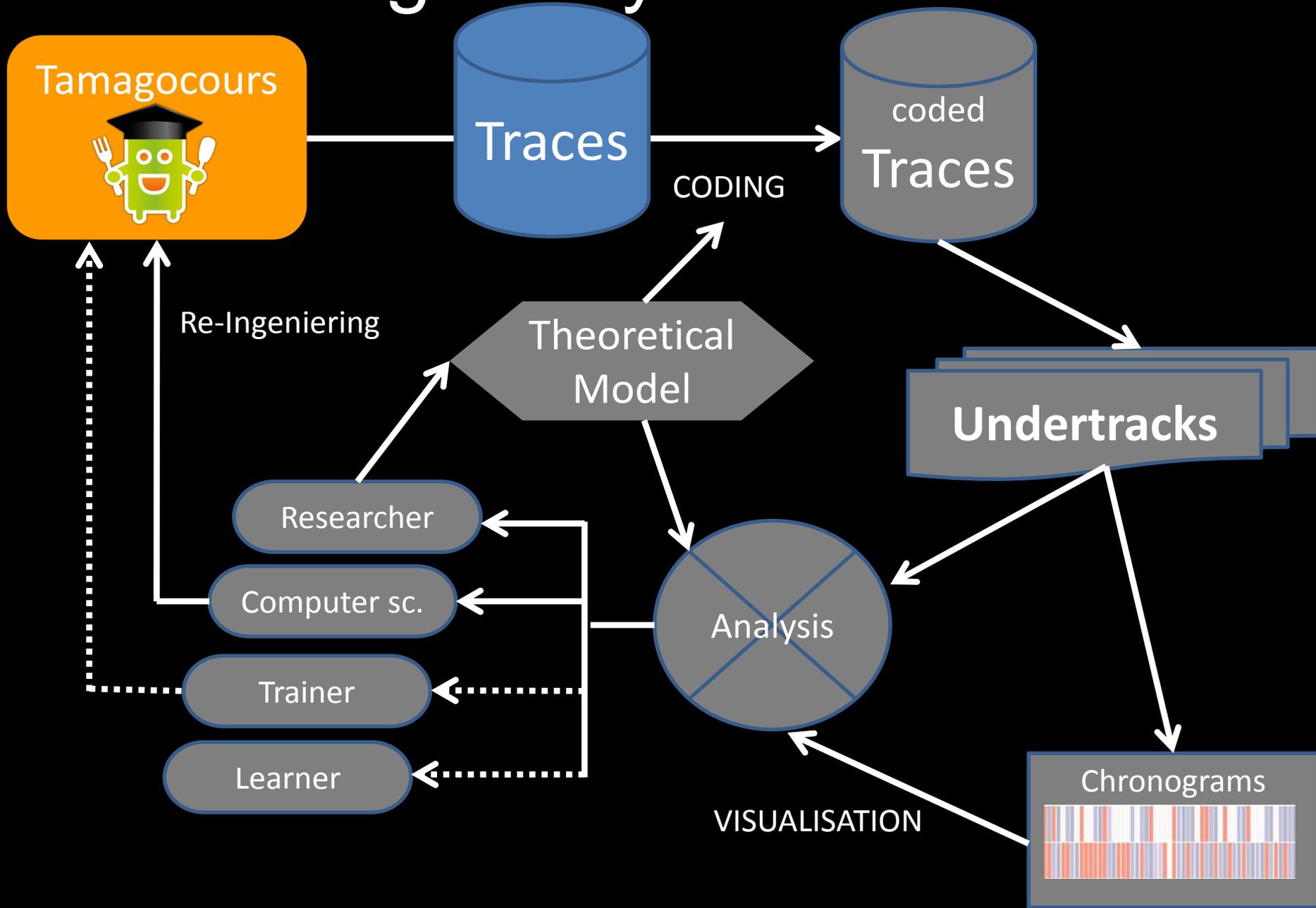
- Crash test (Oct. 2013): 18 in-service teachers
- test 1 (Nov. 2013): 16 pre-service teachers
- test 2 (Feb. 2014): 9 pre-service teachers
- Study (April 2014) : 193 pre-service teachers
- Study (April 2015) : 242 pre-service teachers

...all students are distant at various moment of the day

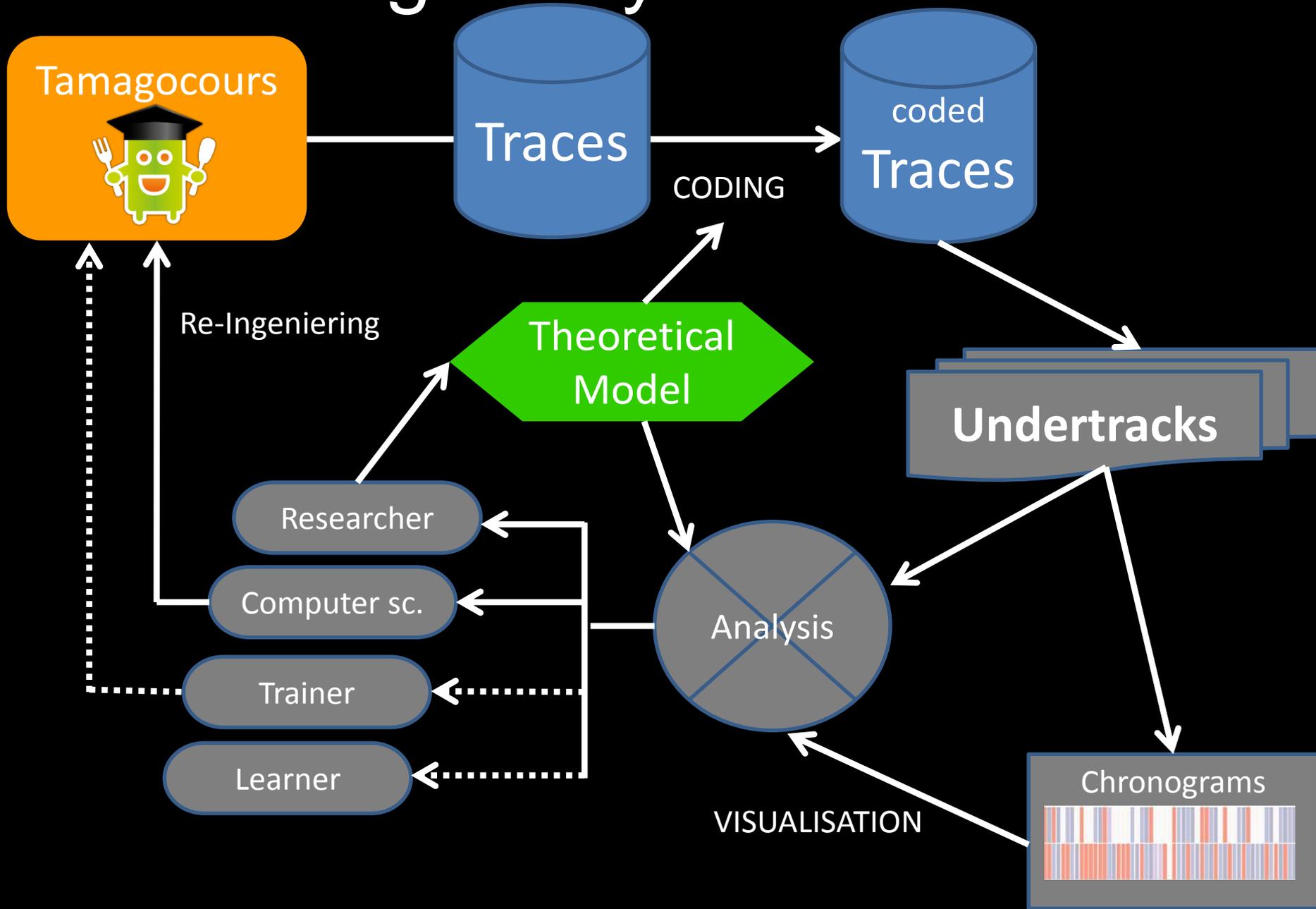
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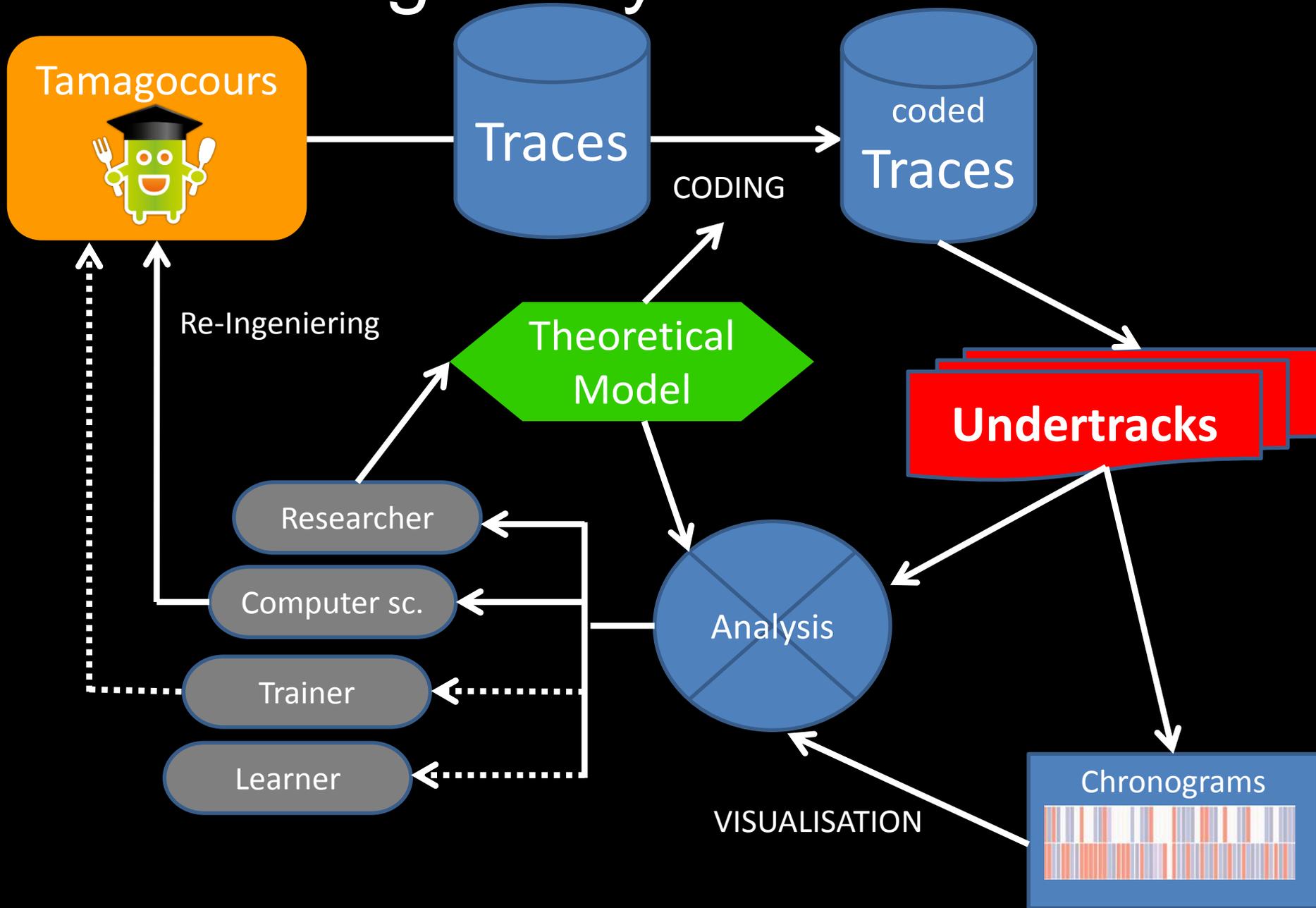
Learning Analytics



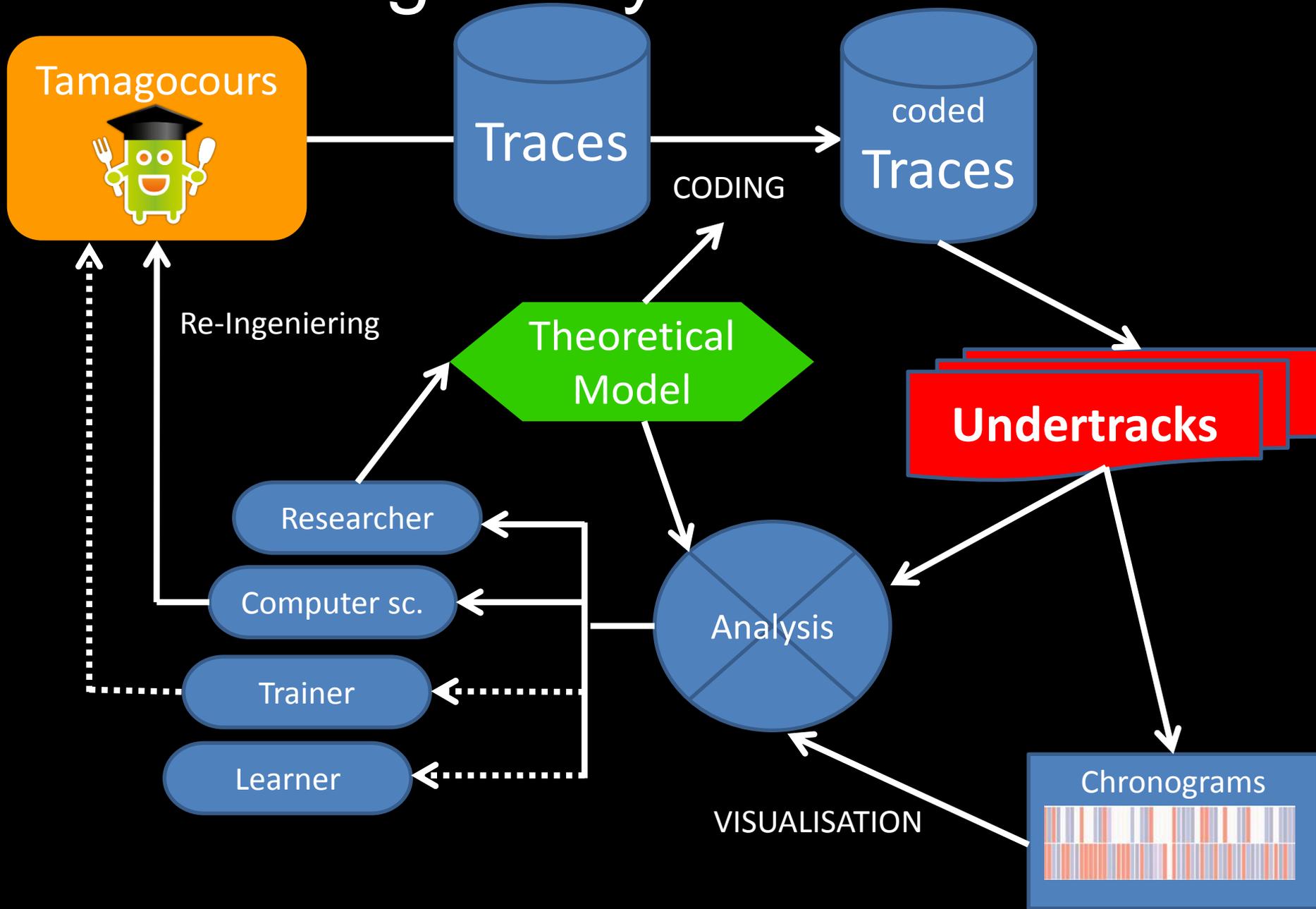
Learning Analytics



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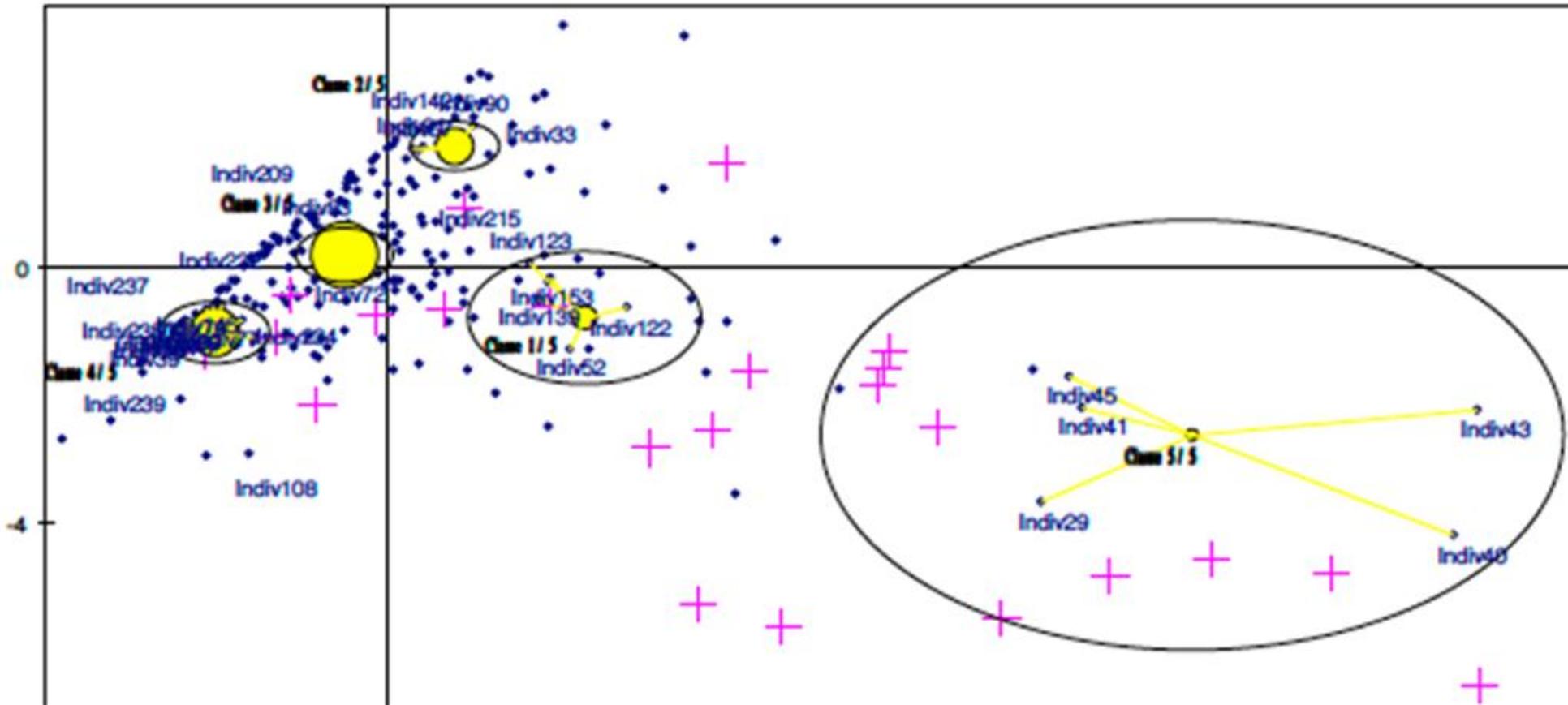
Variables collected or calculated

Variables	Player Actions
TotalAction	Number of actions performed by the player
Duree_sec	Time devoted to play
FeedTamago	Feeding the Tamagocours
FeedGood	Feeding the Tamagocours with an appropriate resource
FeedBad	Feed the Tamagocours with a non-appropriate resource
Chat_F	Message about a legal rule (formulation)
Chat_V	Message about a legal rule (discussion)
Chat_OJ	Message about a the game
...	...

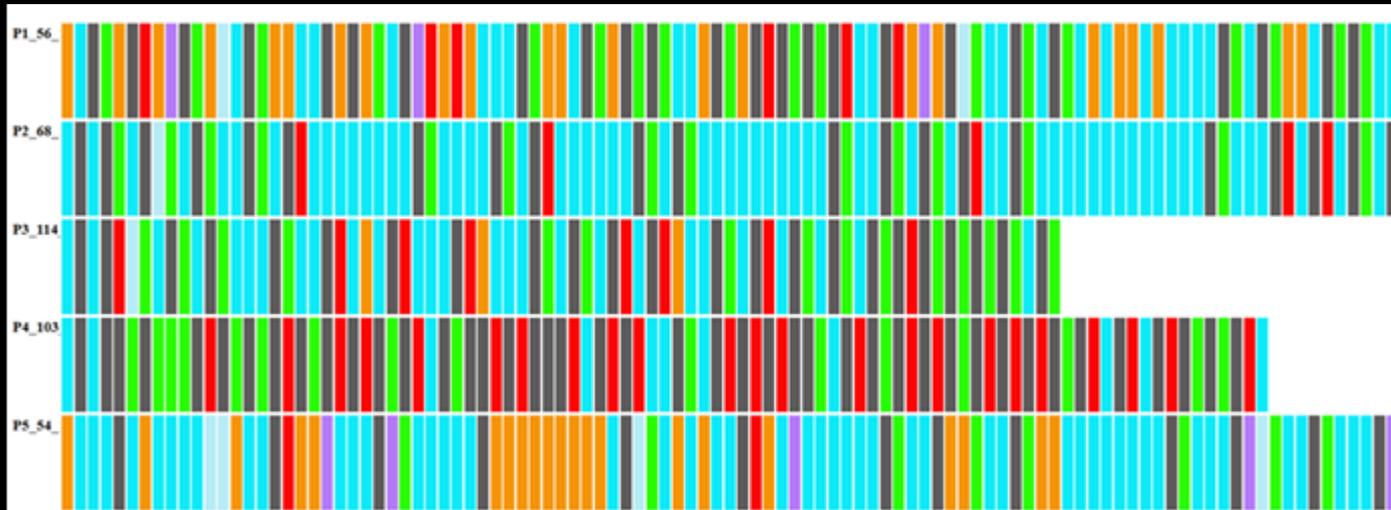
Results?



Principal Component Analysis (PCA) Ascending Hierarchical Classification (AHC)



Classes of Players (levels 1 to 3)

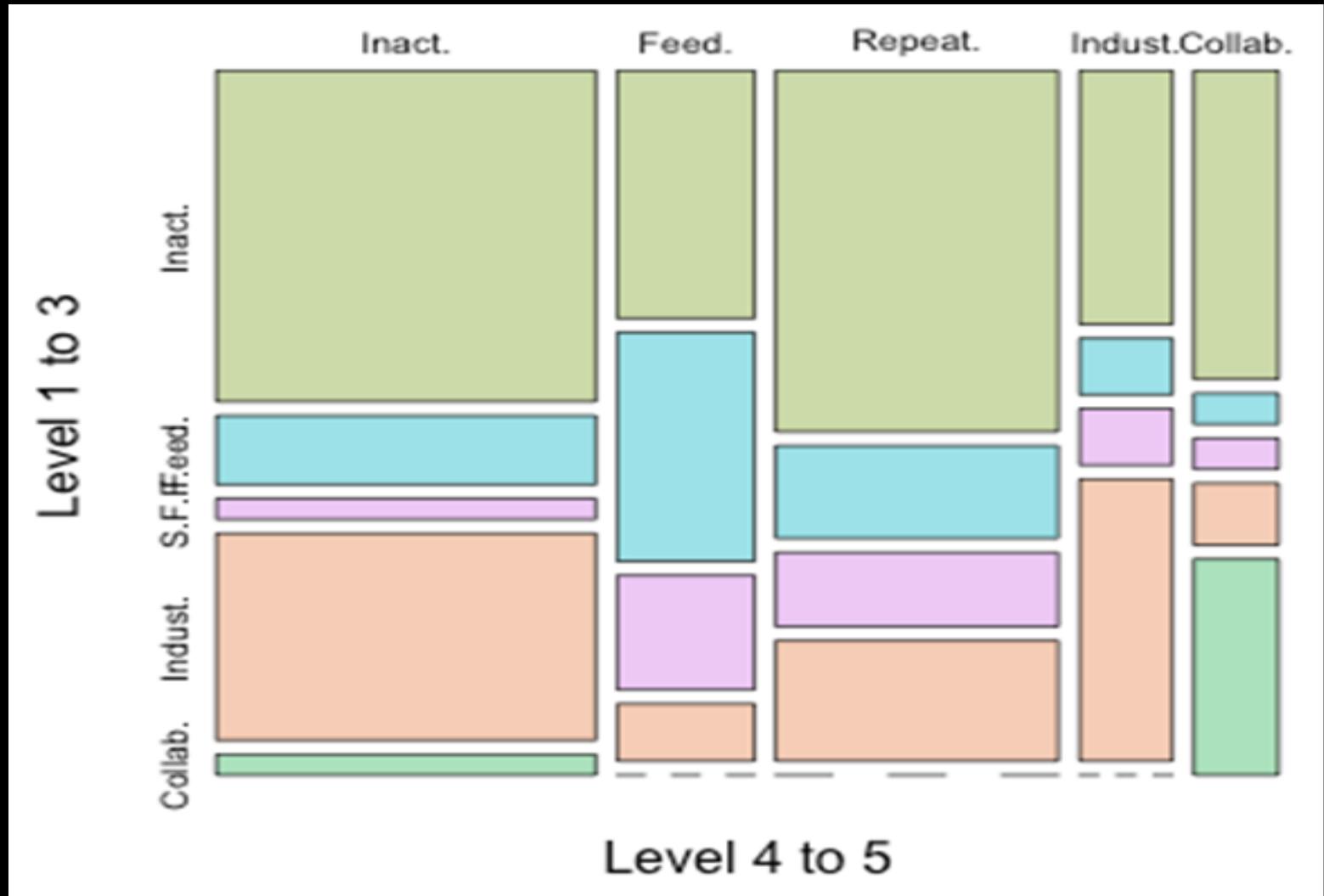


Inactive (49%), Force-Feeders (14%),
Successful Force-Feeders (8%),
Industrious (25%), Collaborators (4%)

Sanchez, E., Emin Martinez, V., & Mandran, N. (2015). Jeu-game, jeu-play vers une modélisation du jeu. Une étude empirique à partir des traces numériques d'interaction du jeu Tamagocours. STICEF, 22(1).



Evolution of Students' Strategies (*mosaic plot*)



It is time to conclude!



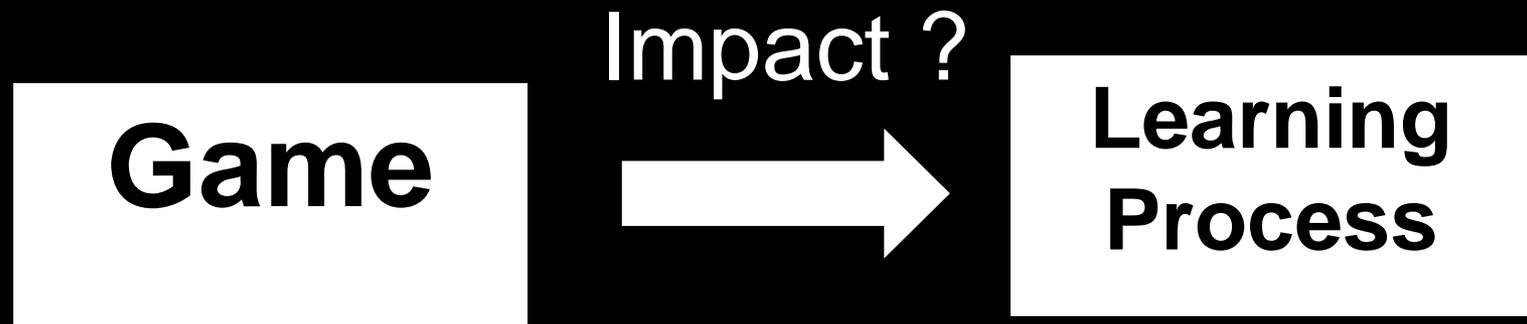
Learning Analytics & stakeholders...

The opportunity to monitor the learning process dynamics for:

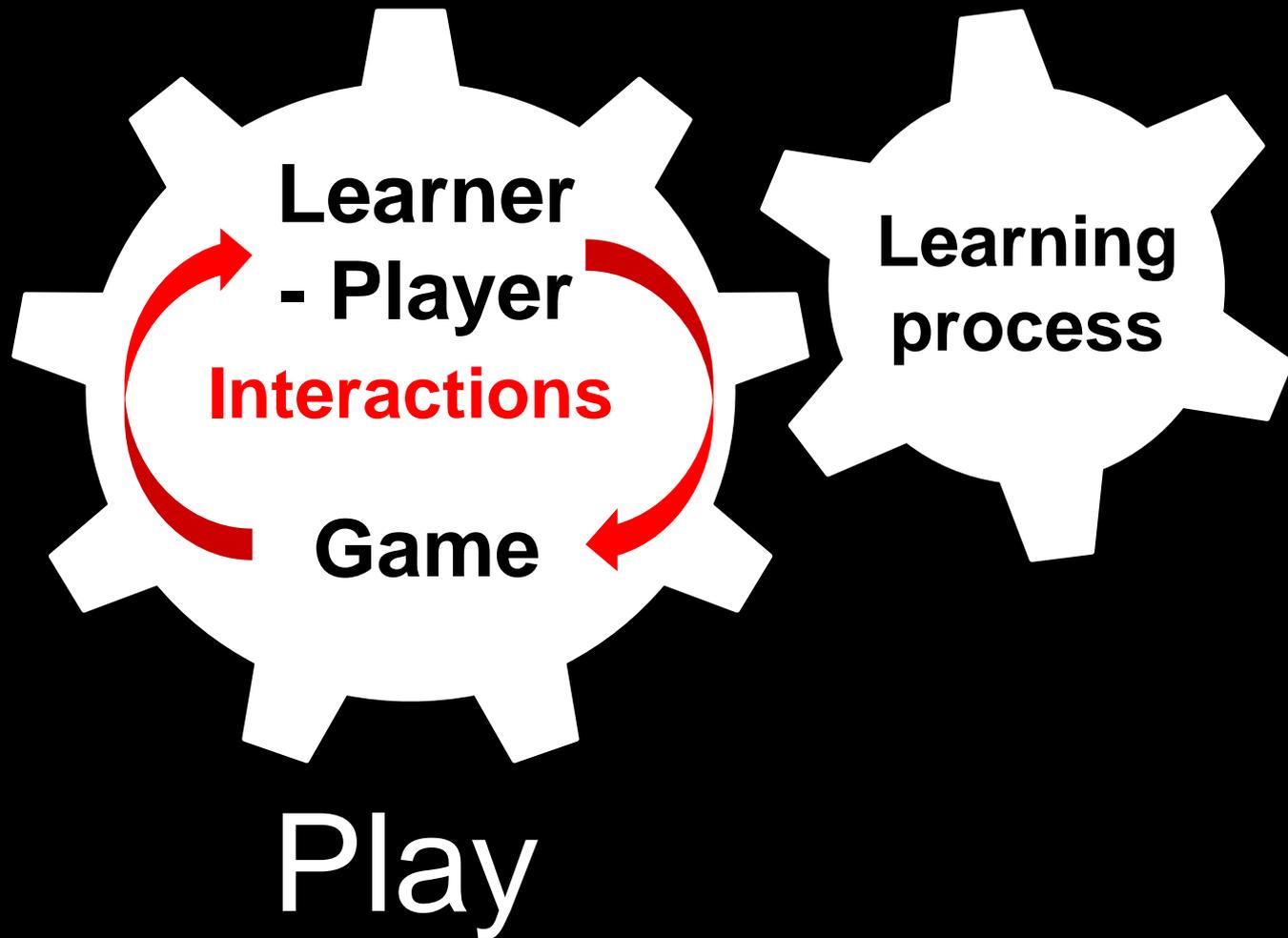
- Design of digital technologies (**Software developers**)
- Practice, formative assessment (**trainers**)
- Learning, reflexivity (**students**)

Arguments for considering the situation (interactions) rather than the artifact (**researchers**)

Game-Based Learning ?



Play Based-Learning



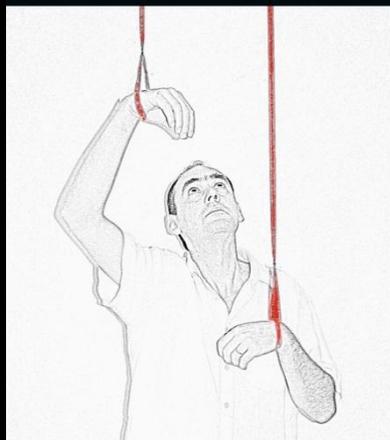
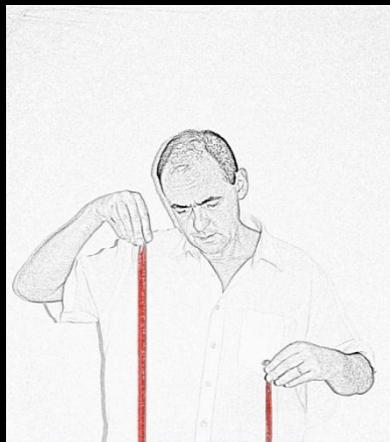
« Play does not lay in the artifact but rather in its use »



Henriot, J. (1969). *Le jeu*. Paris: Presses Universitaires de France.

Genvo, S. (2011). Penser les phénomènes de "ludicisation" du numérique. Pour une théorie de la jouabilité. *Revue des sciences sociales*(45), 68-77.

eric.sanchez@ens-lyon.fr



@australopitek