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# Pieces of Knowledge: Multimodal Emergence and Trajectory in Socio-Scientific Educational Debates

Claire Polo

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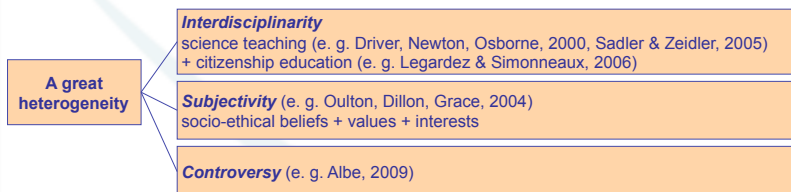
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Interactions, Corpus, Apprentissages, Représentations

Claire POLO

PhD in Education Sciences  
Post-Doc for the ASLAN LABEX

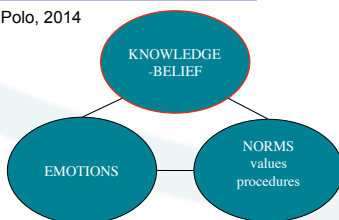
## Pieces of Knowledge: Multimodal Emergence and Trajectory in Socio-Scientific Educational Debates.

### ARGUMENTATIVE RESOURCES IN SOCIO-SCIENTIFIC EDUCATIONAL DEBATES



➤ Appeal to students' "system of mental representations and knowledge" (Beitone & Legardez, 1995, *système de représentations-connaissances*)

Polo, 2014



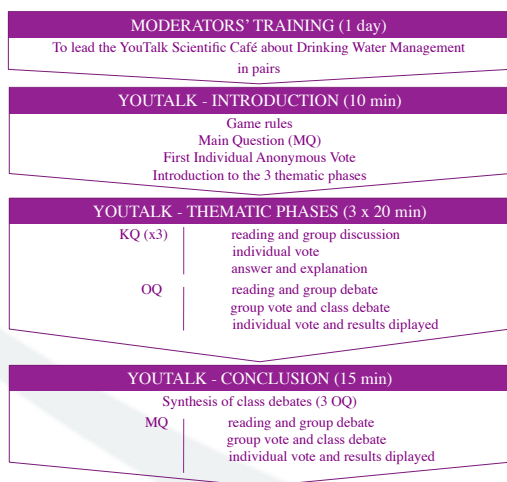
PIECES of KNOWLEDGE-BELIEF (Polo, 2014)			
Source(s)	Logical level	Degree of generality	Relation to target knowledge
1. Own experience			
2. Testimony			
3. School			Translatable ?
4. Previous café steps			
5. Family			
6. Media			Favouring or disturbing acquisition ?

### PEDAGOGICAL SETTING: the YouTalk Scientific Café

**Participants:** 12-14 year-old students

**Specially trained student moderators:** 15-17 year-old students

**Schools:** 2 in Mexico, 1 in USA, 1 in France, 2 in Brazil

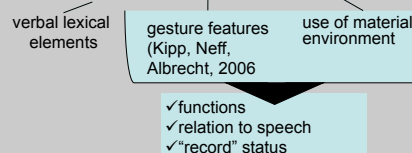


### HOW DO THE STUDENTS CO-CONSTRUCT AND REINVEST MICRO-UNITS OF KNOWLEDGE-BELIEF?

➤ **Temporal tracking** (*Transana*)  
Training, YouTalk pedagogical sequence

➤ **Spatio-communicative specificity**  
Group discussion on quiz elucidation  
Class explanation of correct answer  
Group debate about an opinion question (OQ)  
Class debate on an OQ  
Group and class debate about the MQ

➤ **Multimodal characterization** (*ELAN*)



(Bavelas et al., 1992, Colletta et al., 2009, Goldin-Meadow, 2003, Kendon, 2004, McNeill, 1992, 2000)

### FIRST RESULTS FROM THE US CORPUS:

**Different spatio-temporal localizations associated with different scenarios of material environment exploitation**

Mostly consists of:

- reading the slide or referring gesturally to the screen
- using something to point
- handling the clicker to display determination to select an option or emergency to get to a conclusion (positioning or/and interactional function).

Exploitation of the material environment mostly occurs at the group level	
Initial group discussion for quiz elucidation (KQ)	Reinvestment in group debate to select an answer (OQ)
Supporting meaning-making process (mostly referential functions)	Appeal to authority and interactional functions

### Different knowledge units associated with different gestural scenarios

"Virtual water"	Price / Cost
-Imprecise gestures -Referential function -Little redundancy with speech ➤Repetitions	-Less and smaller gestures -Diversity of functions -More redundant with speech ➤Reinvestment with other words or gestures
Exploitation of the material environment is not very sensitive to the knowledge content.	

### ARE EMERGENCE AND TRAJECTORY FEATURES KNOWLEDGE-SPECIFIC?

➤ **Focus on units of different epistemic status**

- Knowledge piece specific to environmental education aiming at changing practices with new conceptions  
"Virtual water": water for the production of other goods

- Classical distinction between the cost and the price of a good or service, both school target knowledge in economics and part of daily life vocabulary.

➤ **Comparison of emergence multimodal features and spatio-temporal trajectory**

Université Lumière Lyon 2 / 5, avenue Pierre Mendès-France F-69676 Bron Cedex  
Ecole Normale Supérieure de Lyon / 15, Parvis René Descartes F-69342 Lyon BP 7000 Cedex 07

