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

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**ARGUMENTATIVE RESOURCES IN SOCIO-SCIENTIFIC EDUCATIONAL DEBATES**

**PIECES of KNOWLEDGE-BELIEF (Polo, 2014)**

<table>
<thead>
<tr>
<th>Source(s)</th>
<th>Logical level</th>
<th>Degree of generality</th>
<th>Relation to target knowledge</th>
<th>Translatable?</th>
<th>Favours or disturbing acquisition?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Own experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Testimony</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. School</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Previous café steps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Family</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Media</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**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)
  - Use of material environment
    - Gesture features
    - Relation to speech
    - “Record” status


**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

**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 interactional function)

**Exploitation of the material environment mostly occurs at the group level**

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

**Different knowledge units associated with different gestural scenarios**

<table>
<thead>
<tr>
<th>“Virtual water”</th>
<th>Price / Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Imprecise gestures</td>
<td>- Less and smaller gestures</td>
</tr>
<tr>
<td>- Referential function</td>
<td>- Diversity of functions</td>
</tr>
<tr>
<td>- Little redundancy with speech</td>
<td>- More redundant with speech</td>
</tr>
<tr>
<td>- Repetitions</td>
<td>- Reinvestment with other words or gestures</td>
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Exploitation of the material environment is not very sensitive to the knowledge content.

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**6ème Conférence de l’Association Française de Linguistique Cognitive, Language, Cognition et Société - 27/05/2015, Grenoble**

**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**

**PIECES of KNOWLEDGE-BELIEF (Polo, 2014)**

- Appeal to students’ “system of mental representations and knowledge” (Beitone & Legardez, 1995, système de représentations-connaissances)

**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

**MODERATORS’ TRAINING (1 day)**

To lead the YouTalk Scientific Café about Drafting Water Management
- Game rules
- Main Question (MQ)
- First Individual Anonymous Vote
- Introduction to the 3 thematic phases

**YOU TALK - INTRODUCTION (10 min)**

Rules:
- MQ (Main Question)
- IAV (Individual Anonymous Vote)

**YOU TALK - THEMATIC PHASES (3 x 20 min)**

<table>
<thead>
<tr>
<th>KQ(x)</th>
<th>OQ</th>
<th>MQ</th>
</tr>
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<tbody>
<tr>
<td>answer and explanation</td>
<td>group vote and class debate</td>
<td>individual vote and results displayed</td>
</tr>
<tr>
<td>reading and group discussion</td>
<td>group vote and class debate</td>
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**YOU TALK - CONCLUSION (15 min)**

<table>
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<th>Synthesis of class debates (3 OQ)</th>
<th>MQ</th>
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<td>individual vote and results displayed</td>
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**PREVIOUS SCHOOL EXPERIENCE**

- Own experience
- Family experience
- School experience
- Previous café steps
- Group vote and class debate
- Class debate on an OQ
- Group and class debate about the MQ

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