Pieces of Knowledge: Multimodal Emergence and Trajectory in Socio-Scientific Educational Debates
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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>Favouring or disturbing acquisition ?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Own experience</td>
<td></td>
<td></td>
<td>Translatable ?</td>
<td></td>
</tr>
<tr>
<td>2. Testimony</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. School</td>
<td></td>
<td></td>
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<tr>
<td>4. Previous café steps</td>
<td></td>
<td></td>
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<tr>
<td>5. Family</td>
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<tr>
<td>6. Media</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)
  - Group and class debate about the MQ

- Multimodal characterization (ELAN)
  - Functions
  - Relation to speech
  - "record" status

- Focus on units of different epistemic status
  - Knowledge piece specific to environmental education
  - Aim 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

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**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 (most referential functions)
- Appeal to authority and interactional functions

**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>
</tr>
</tbody>
</table>

Exploitation of the material environment is not very sensitive to the knowledge content.