Discourse into the “Intellectual Heart” of a Domain

Jianwei Zhang
State University of New York at Albany

http://tccl.rit.albany.edu
Classroom talk on the Grade 3 notes about how worms sense light

The survival group did an experiment on worms sensing light. We know worms sense light because we shined light on worms and they went under the black paper.

Discourses in the Colours of Light view

Knowledge building in Year 3

The initial Light view

New views:
- Colours of Light;
- Shadows;
- Reflection (later changed to “Light and Materials”);
- Other Light

The Other Light view evolved into four new views:
- How Light Travels
- All We See Is Light?
- Natural and Artificial Light
- Images in Our Eyes and in Films
An Example of Inquiry Threads

The inquiry thread of “shadows,” lasting from early February to mid-April, included 11 notes authored by 11 students seeking a deeper understanding of the nature of shadows, with all 22 students as readers.
Idea Improvement in a Thread

- Code ideas on a four-point scale (1 - pre-scientific, 2 - hybrid, 3 - basically scientific, and 4 - scientific)

<table>
<thead>
<tr>
<th></th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.93</td>
<td>2.46</td>
<td>2.86</td>
</tr>
<tr>
<td>SD</td>
<td>.90</td>
<td>.90</td>
<td>.99</td>
</tr>
<tr>
<td>n</td>
<td>57</td>
<td>55</td>
<td>50</td>
</tr>
</tbody>
</table>

\( F(2, 159) = 13.51, \ p < .001, \ \eta^2 = 0.15 \).
Figure 2. The percentage of the 1st 1000 words in each student’s writing.

Figure 3. The percentage of the 2nd 1000 words in each student’s writing.

Figure 4. The percentage of academic words in each student’s writing.

e.g., theory, evidence, hypothesis, approach, challenge, clarify, identify, expand, adjust, category, conclude

(Sun, Zhang, & Scardamalia, in press)
## Domain-Specific Vocabulary

<table>
<thead>
<tr>
<th></th>
<th>Of or below Grade 4</th>
<th>Beyond Grade 4</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td># of domain words identified</td>
<td>46</td>
<td>43</td>
<td>89</td>
</tr>
<tr>
<td># of domain words used by students</td>
<td>41</td>
<td>30</td>
<td>71</td>
</tr>
</tbody>
</table>

(Sun, Zhang, & Scardamalia, in press)

http://tccl.rit.albany.edu
Correlations between lexical indicators and depth of understanding

<table>
<thead>
<tr>
<th></th>
<th>Total words written</th>
<th>Total domain words</th>
<th>Unique domain words</th>
<th>% of the academic words</th>
<th>% of the 1st 1,000 words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of understanding</td>
<td>.646 (.001)</td>
<td>.660 (.001)</td>
<td>.458 (.032)</td>
<td>.506 (.016)</td>
<td>-.646 (.001)</td>
</tr>
</tbody>
</table>
Discourse into the “Intellectual Heart” of a Domain

- Children’s questions
- Key concepts, not as answers to remember, but to use as “think devices,” to formulate new inquiries

http://tccl.rit.albany.edu