A Writing Support Tool for Distance Students

J. BARROW

Department of Computer Science and Information Systems
University of South Africa, Box 392, Pretoria
E-Mail: barroje@alpha.unisa.ac.za
Facsimile: (012)-429-3434

Abstract: This paper describes SuperText, a computer program designed to support productive expository writing processes among students at a distance teaching university. Being able to write well is an important communication skill, and the writing process can help to build and clarify the writer's knowledge. Computers can support this by providing a medium to externalise and record the writer's cognition. Appropriate representations for such externalisation are uninstantiated idea labels, instantiated text units, and a variety of relationships between these items. SuperText uses these representations to support a range of writing styles. It provides several independent 'Views' that represent the structure of the evolving document through expanding hierarchies, each with a variety of presentations. Allied to these Views is a text workspace providing access to a database of continuous text nodes. Taken together, these provide an ability to represent global and intermediate structures of the document well beyond that of conventional editors. These aspects were all rated highly by students participating in a series of field trials of SuperText.
Why address student writing?

- Communication skills
- Knowledge building

Computer support for writing

- Externalise cognition

Knowledge representation and manipulation

- Support process

Not just product
Knowledge structures in writing

- Idea labels
  *Uninstantiated items*

- Continuous text units
  *Instantiated items*

- Relationships
  *
  *Free*
  *Network*
  *Hierarchical*
  *Linear*
Classical writing process (1)

Flower & Hayes

- Many constraints at different levels
- Constraint management through task partitioning
- Goal-directed planning
- Progression from freedom to constraint
- Series of representations
Classical writing process (2)

Scardamalia & Bereiter

Two models:

- "Easy" - Knowledge Telling as an extension on conversation
- "Hard" - Knowledge Transformation through tension between content space and rhetoric space
- Series of representations

<table>
<thead>
<tr>
<th>Content space</th>
<th>Knowledge Building</th>
<th>Rhetoric space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unordered</td>
<td></td>
<td>Structured</td>
</tr>
<tr>
<td>Isolated</td>
<td></td>
<td>Connected</td>
</tr>
<tr>
<td>Fragmented</td>
<td></td>
<td>Instantiation</td>
</tr>
</tbody>
</table>
Classical writing representation (1)
Classical writing representation (2)

Main idea 1
- Sub idea 1.1
- Sub idea 1.2

Main idea 2
- Sub idea 2.1
- Sub idea 2.2

Words
Words
& more
Words
Underlying mental models (1)

Storage Models $\rightarrow$ Classical Writing

Ideas are distinct entities that can be:
- stored in long-term memory
- manipulated in short-term memory

Knowledge building occurs by
- structuring ideas during planning

Manipulating idea labels (ie, planning)
- increases efficiency
- simplifies reworking
Ideas emerge:
• from parallel brain activity
• between many simple elements
• in response to external stimuli

Knowledge building occurs by synthesising a fully expressed and coherent response to a particular stimulus

Attempts to isolate and manipulate ideas are:
• contrived
• interfere with real understanding
SuperText

Goal

Provide passive writing support for students' active knowledge building activities

Subgoals

• Distance learning

• Range of writing styles (Classical to Romantic)

• Emphasise process (not product)

Tools

Multiple, linked spaces for:
• Uninstantiated items (structure)
• Instantiated items (continuous text)
• Hierarchical relationships
SuperText tour (1)

Note 25

View 1

Use Count is 5

Begeman, Michael
- gIBIS: A Hypertext Tool for Exploratory Policy Discussion

Bernstein, Mark
- The Bookmark and the Compass: Orientation Tools for Hypertext Users

Campagnoni, FR
- Information Retrieval Using a Hypertext-Based Help System

Conklin, Jeff
- Hypertext: An Introduction and Survey
  - gIBIS: A Hypertext Tool for Exploratory Policy Discussion

Danielsen, K
- Multi-Dimensional Outlining

Note 25

PreView

Use Count is 5

The Bookmark and the Compass: Orientation Tools for Hypertext Users
* Bernstein Mark
* ACM SIGOIS Bulletin, 9(4), Oct 88, pp 34 - 45
Hypertext (HT) can vary from almost-linear to emphatically non-linear.

.. more ..

1. Authoring
   1.1. Authoring Considerations for Hypertext
   1.2. Reflections on Authoring, Editing, and Managing Hypertext.
   1.3. Writing & Reading Hypertext: An Overview

2. Cartographic issues
   2.1. Context and Orientation in Hypermedia Networks
   2.2. qIBIS: A Hypertext Tool for Exploratory Policy Discussion
   2.3. The Bookmark and the Compass: Orientation Tools for Hypertext User

3. Content and structure independence
   3.1. A Database Model for Flexible Hypertext Database Systems
   3.2. Writing & Reading Hypertext: An Overview

4. Hierarchies and heterarchies
   4.1. Context and Orientation in Hypermedia Networks

The Bookmark and the Compass: Orientation Tools for Hypertext Users
* Bernstein Mark
* ACM SIGOIS Bulletin, 9(4), Oct 88, pp 34 - 45
Hypertext (HT) can vary from almost-linear to emphatically non-linear.

Hypertext (HT) can vary from almost-linear to emphatically non-linear. Presentation, layout and links all offer orientation cues to HT viewers (cf cues provided by books).

Maps & Indexes (Tables of Contents)
* Strictly hierarchical systems: local navigation through parents, siblings and children of current node
* Unstructured systems: long-range info shown by links between documents (eg Intermedia); fisheye views suppress remote detail.

Is automatic cartography satisfactory? Manual cartography instead (eg HyperGate). (Semi-automatic cartography? eg Guided Tours & Tabletops in...
<table>
<thead>
<tr>
<th>Rank</th>
<th>Mean</th>
<th>Deviation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>0.95</td>
<td>0.12</td>
<td>Strong agreement: the different hierarchical representations are very useful.</td>
</tr>
<tr>
<td>2nd</td>
<td>0.87</td>
<td>0.16</td>
<td>Strong agreement: the multiple views are very useful to quite useful.</td>
</tr>
<tr>
<td>3rd</td>
<td>0.85</td>
<td>0.17</td>
<td>Strong agreement: the expandable hierarchies are very useful to quite useful.</td>
</tr>
<tr>
<td>5th</td>
<td>0.84</td>
<td>0.17</td>
<td>Strong agreement: the user prompts are very useful to quite useful.</td>
</tr>
<tr>
<td>7th</td>
<td>0.74</td>
<td>0.19</td>
<td>Strong agreement: SuperText is quite reliable.</td>
</tr>
<tr>
<td>7th</td>
<td>0.73</td>
<td>0.21</td>
<td>Fair agreement: using SuperText to represent one's thinking about a topic is easy to very easy.</td>
</tr>
<tr>
<td>20th</td>
<td>0.64</td>
<td>0.35</td>
<td>Some agreement: the SuperText method will be quite helpful in future essay preparation.</td>
</tr>
</tbody>
</table>