Educational Software
User Interface
Design Principles
A Brief Overview

Chi-Ming Chow MD
St. Michael’s Hospital
University of Toronto
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Figure 2.1. Cognitive Processes Involved in e-Learning

Table 1.1. Surface Processes of Emotions.

<table>
<thead>
<tr>
<th>Gene</th>
<th>Surface Feature</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill</td>
<td>Motivation</td>
<td>Determination to engage in a task</td>
<td>High self-motivation in exercise</td>
</tr>
<tr>
<td></td>
<td>Cognitive</td>
<td>Thought processes related to solving problems</td>
<td>Deep thought about math problems</td>
</tr>
<tr>
<td></td>
<td>Affective</td>
<td>Emotional reactions to experiences</td>
<td>Happy about winning a competition</td>
</tr>
</tbody>
</table>

Table 1.2. Deeper Processes of Emotions.

<table>
<thead>
<tr>
<th>Gene</th>
<th>Deeper Feature</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill</td>
<td>Sensation</td>
<td>Perceptions of stimuli</td>
<td>Sensing the color blue</td>
</tr>
<tr>
<td></td>
<td>Perception</td>
<td>Interpretation of sensations</td>
<td>Understanding language</td>
</tr>
<tr>
<td></td>
<td>Reflection</td>
<td>Mental analysis of experiences</td>
<td>Reflecting on past events</td>
</tr>
</tbody>
</table>

Table 1.3. Surface Functions of Emotions.

<table>
<thead>
<tr>
<th>Function</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expressive</td>
<td>Articulate emotions through speech</td>
</tr>
<tr>
<td>Impulsive</td>
<td>React without thought</td>
</tr>
<tr>
<td>Reflective</td>
<td>Consider options before acting</td>
</tr>
</tbody>
</table>

Table 1.4. Deeper Functions of Emotions.

<table>
<thead>
<tr>
<th>Function</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory</td>
<td>Manage emotions to achieve goals</td>
</tr>
<tr>
<td>Intuitive</td>
<td>Make decisions based on gut feelings</td>
</tr>
</tbody>
</table>

For the visual content, please refer to the images provided.
Goals

Goals are:
To inform or motivate
To build near-transfer (procedural) skills & associated knowledge
To build far-transfer (problem-solving) skills & associated knowledge
Can include procedural skills that support far-transfer tasks

Context

Context includes:
- Learner Profile: e.g. novice, advanced, mixed
- Learning landscape: e.g. classroom, self-study computer
- Delivery media: e.g. book, computer (resolution, bandwidth, etc.)
- Pragmatic issues: e.g. budget, style guides, etc.

Design Visual Approach

Designing the Visual Approach includes:
- Determine the image
- Assess general graphic requirements of content
- Design Treatment - includes decisions about:
  - Instructional Strategy:
    - Text dominant or visual dominant
    - Layout or Interface for media (style, orientation, real-estate)
    - Navigation and functionality (for online learning)
    - Surface features that align with context and goals

Identify Communication Functions

Identify Communication Function for:
- Multiple content - use organizational visuals
- Procedures - use representational, transformational visuals
- Concept - use diverse representational or interpretive visuals
- Facts - use representational and mnemonic visuals
- Process - use transformational visuals
- Principles - use explanatory visuals, such as relational, interpretive, or transformational
Apply Principles

Apply Principles:
For all instructional goals,
   apply principles to awaken prior knowledge and support transfer
If complex content, novice audience, or runs outside learner control
   then apply attention and cognitive load principles
If building far-transfer skills
   then apply mental model principles
If building near-transfer skills
   then apply transfer principles
If learners low in personal motivation
   then apply motivational visual principles
Interface Guidelines - Online Resources

Apple Human Interface Guidelines

Cornell University Ergonomics Web
  http://ergo.human.cornell.edu/ah/ah/ah-interface.html

Society for Technical Communication

KDE Developer’s Guide
  http://developer.kde.org/documentation/design/uid/

Last Accessed: 27 July 2006

Application Guidelines

✔ Match visuals to the instructional goals
✔ Avoid unrelated visuals that activate the wrong memory
✔ Use visuals for spatial content
✔ For deeper learning, use visuals that show cause and effect relationships
✔ Engage learners with your visuals

Figure 3.2 Five Guidelines to Optimize the Use of Graphics for Instruction
Add some learning engaging visuals to help learners understand the content or encourage their participation.