Development and Usability Testing of the Operating Manual for BraidMagic™

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Agenda

- Introduction
  - BraidMagic™?
  - Objectives

- Operating Manual Development

- Usability Testing

- Analysis & Results

- Discussion

- Conclusions
What is BraidMagic™?

Braiding with BraidMagic

A high-fashion style created with BraidMagic
Operating Manual Development

- Literature Analysis
  - Hierarchy of Contents Development
    - Format and Layout Design
      - Manual Development
        - Paper Manuals
          - Guidelines of Safety/Warranty
            - Parts Naming
              - Task Analysis
                - Photo Editing
1. Safeguards
2. Parts and Specifications
3. Operating Instructions
4. Maintenance
5. Warranty and Service
Manual Features (selected)

- Step-by-step instructions along with pictures
- Structured information
- Tools for easy location of information
User-friendly Instructions

- Step-by-step instructions in plain language for the target user population (high school diploma or GED) with helpful pictures.

2.2 Align the hair grips for equal distance and tension on the strands.

**NOTE:** For tube alignment, pull the machine slightly (½") toward your body.

2.3 Hold the grip of the machine, maintaining a natural, straight posture at the wrist.
Structured Information

- Warnings, cautions, and notes were added to prevent any accidental misuse or handling of BraidMagic.

  **WARNING:** Unplug BraidMagic before sanitation.

  **CAUTION:** Do **NOT** clean the machine body under running water or by submersion.

  **NOTE:** Use the small cleaning brush for the top and middle tube bodies and the large cleaning brush for the bottom tube body.
Information Locating Tools

- Table of Contents was provided with page numbers to allow for quick reference to information.

- Reference tabs were provided on corresponding pages.

Table of Contents

- Safeguards ....................... 2
- Parts and Specifications ........ 3
- Operating Instructions .......... 5
- Maintenance ...................... 10
- Warranty & Service ............. 13
Usability Testing - Participants

- 5 cosmetology students
- All females
- Age: 18-25 years
- Cosmetology training: 60 to 700 hrs.
Test Design

1. Pre-Test Session

   - Orientation Script
   - Consent Forms
   - Background Questionnaire

2. Test Session

   - Locate Information
   - Understand Safeguards
   - Identify and Learn Parts and Specifications
   - Follow Operating Instructions
   - Follow Maintenance Instructions
   - Understand Warranty Conditions
   - Use Service Cards

3. Post-test Session

   - Debriefing
## Measure/Instrument Matrix (selected)

<table>
<thead>
<tr>
<th>Measures</th>
<th>Locate Information</th>
<th>Safeguards</th>
<th>Instrument/Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completion Time</td>
<td>☐</td>
<td>☐</td>
<td><strong>Stop watch</strong></td>
</tr>
<tr>
<td>% Correct Answers</td>
<td></td>
<td>☐</td>
<td><strong>T/F, Matching, Multiple-choice</strong></td>
</tr>
<tr>
<td><strong>Preference</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usefulness</td>
<td>☐</td>
<td>☐</td>
<td><strong>Questionnaire with Likert Scales</strong></td>
</tr>
<tr>
<td>Ease of Use</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Learnability</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Accessibility</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Clarity</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Conciseness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
</tbody>
</table>
### Parts Name Matching (illustrated)

#### Matching questions for parts name identification

<table>
<thead>
<tr>
<th>Column A (Names)</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed Control Dial</td>
<td><img src="image.png" alt="Image" /></td>
</tr>
<tr>
<td>Docking Posts</td>
<td><img src="image.png" alt="Image" /></td>
</tr>
<tr>
<td>Adapter Plug</td>
<td><img src="image.png" alt="Image" /></td>
</tr>
<tr>
<td>Grip</td>
<td><img src="image.png" alt="Image" /></td>
</tr>
<tr>
<td>Barrel</td>
<td><img src="image.png" alt="Image" /></td>
</tr>
<tr>
<td>Power Switch</td>
<td><img src="image.png" alt="Image" /></td>
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</tbody>
</table>
Assessment Questions (illustrated)

<table>
<thead>
<tr>
<th>Questions</th>
<th>Very Poor</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Very Good</th>
</tr>
</thead>
<tbody>
<tr>
<td>How useful is it for information search?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>How easy is it to use?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>How easy is it to learn?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>How explicit is the organization?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>How clear is the terminology?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Questions</th>
<th>Very Dissatisfied</th>
<th>Dissatisfied</th>
<th>Somewhat Satisfied</th>
<th>Satisfied</th>
<th>Very Satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is your overall satisfaction?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
# Assessment Results - Overall

<table>
<thead>
<tr>
<th>Section</th>
<th>Average</th>
<th>S.D.</th>
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</thead>
<tbody>
<tr>
<td>Table of Contents</td>
<td>4.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Safeguards</td>
<td>4.9</td>
<td>0.2</td>
</tr>
<tr>
<td>Parts &amp; Specifications</td>
<td>4.7</td>
<td>0.6</td>
</tr>
<tr>
<td>Operating Instructions</td>
<td>4.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Maintenance Instructions</td>
<td>4.4</td>
<td>0.6</td>
</tr>
<tr>
<td>Warranty Conditions</td>
<td>4.9</td>
<td>0.3</td>
</tr>
<tr>
<td>Service Cards</td>
<td>4.7</td>
<td>0.3</td>
</tr>
</tbody>
</table>
Based on the suggestions and assessment results of the usability testing, 6 recommendations were developed and revisions were made accordingly.

1. Provide a **subsection listing and page numbers** in the Table of Contents.

```
Table of Contents
- Safeguards ................... 2
- Parts and Specifications ....... 3
- Operating Instructions ........ 5
- Maintenance ................... 10
- Warranty & Service ............ 13
```

```
Table of Contents
- Safeguards .................................. 2
- Parts and Specifications ............ 3
  ✓ Parts Diagram ............................ 3
  ✓ Parts Description ....................... 4
  ✓ Specifications ........................... 4
```
2. **Provide additional details** for machine malfunctioning and moisture content of hair in Safeguards.

3. **Rename** two parts (hair grip and hair inserter) for better intuitive identification and learnability in Parts and Specifications.
4. **Enlarge the images** in Operating Instructions and Maintenance.

5. **Align** the instructions and images and **include action symbols** in the images.

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2.2 Align the hair grips for equal distance and tension on the strands.

**NOTE:** For alignment, pull the machine slant.

2.3 Hold the grips while maintaining an upright posture at the elbow.

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**Step 2. Tube Docking**

2.1 Place each tube into a docking post of the machine without twisting or crossing over each other.
6. Enlarge the boxes and provide two types of service card (one with lines and one with boxes for address).
Discussion

- Usability testing is a critical design component for user-centered design.

- Use of various performance/preference measures, observations, and open suggestions in the testing facilitated the identification of potential usability problems of the design.
Acknowledgements

We acknowledge HiBraid Inc. in Seoul, Korea, John Jewell, Pat Radford, and cosmetology students of Olde Town Barber & Beauty College at Wichita, KS for their support and time in this study.
Thank you for your attention!