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Pilot Performance: Round Dial and Vertical Tape Altimeters

Erin P. Wesslen

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Pilot Performance: Round Dial and Vertical Tape Altimeter

Erin Wesslen
Research Question

• 1) Can a pilot hold altitude more accurately with a round dial altimeter or a vertical tape altimeter?

• 2) Does the pilot have a preference between the round dial altimeter and the vertical tape altimeter?
Literature Review

Source: http://www.cap-ny153.org/

Source: http://stoenworks.com/

Source: theflightschool.com

Source: http://www.plasticpilot.net/
### Altimeter Tasks

<table>
<thead>
<tr>
<th>Reading Number</th>
<th>Poor</th>
<th>Poor</th>
<th>Good</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceiving Motion</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Poor</td>
<td>Good</td>
</tr>
<tr>
<td>Perceiving Position</td>
<td>Moderate</td>
<td>Poor</td>
<td>Poor</td>
<td>Moderate</td>
</tr>
<tr>
<td>Capturing Altitude</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Poor</td>
<td>Good</td>
</tr>
<tr>
<td>Maintaining Altitude</td>
<td>Good</td>
<td>Good</td>
<td>Poor</td>
<td>Good</td>
</tr>
</tbody>
</table>
Methodology.

• 3 groups of 8 participants
  – No Flight Experience
  – Round Dial Experience
  – Glass Experience

• Fly at 1600 feet for 1:30, climb to 2600 feet and level off for 2600 feet for 1:30, and descend to 1600 feet for 1:30

• Before flying each trial there is a 1 minute practice session

• Survey to determine preference and accuracy
## Results

<table>
<thead>
<tr>
<th></th>
<th>No Flight Experience</th>
<th>Round Dial Experience</th>
<th>Vertical Tape Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analog Results</strong></td>
<td>14.4</td>
<td>11.8</td>
<td>22.9</td>
</tr>
<tr>
<td>(deviation in feet)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vertical Tape Results</strong></td>
<td>27.5</td>
<td>14.3</td>
<td>33.9</td>
</tr>
<tr>
<td>(deviation in feet)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Preference</strong></td>
<td>7 Vertical Tape</td>
<td>6 Vertical Tape</td>
<td>6 Vertical Tape</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td>1 Round Dial</td>
<td>2 Round Dial</td>
<td>2 Round Dial</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Performance</strong></td>
<td>5 Vertical Tape</td>
<td>5 Vertical Tape</td>
<td>6 Vertical Tape</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Round Dial</td>
<td>3 Round Dial</td>
<td>2 Round Dial</td>
</tr>
</tbody>
</table>
Discussion

• Altitude appears to be held more accurately with a round dial altimeter.

• Comments from participants included:
  – Vertical Tape Altimeter was easier to read, but the consistent changing of the number was distracting.
  – Analog was easier to detect trends, and not distracting.
Future Studies

- Larger Sample Size
- Actual Flight Simulator
- More involved flight sequence
- Different instrument such as the Airspeed Indicator
- Why did the glass experience group do so poorly?
Questions?
References


