Modeling, Simulation and Training Procedural Skills: User experience and acceptability of a virtual reality simulator for scrub nurses in neurosurgery

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Modeling, Simulation and Training Procedural Skills:
user experience and acceptability of a virtual reality simulator
for scrub nurses in neurosurgery

M.S. Bracq, E. Michinov, B. Arnaldi, A. Audinot, B. Caillaud, B. Gibaud, V. Gouranton, P.L. Henaux, A. Lamercerie, B. Nogues, P. Jannin

Introduction & Purpose
Assess acceptability and user experience of a VR simulation to train procedural skills for scrub nurses with dedicated models and validated tools.

Materials & Methods
- Scenario based on annotated video observations recorded in the OR
- 150 surgical instruments and 50 different interactions
- Acceptability assessed with the Unified Theory of Acceptance and Use of Technology (UTAUT) questionnaire
- User experience assessed with NASA TLX (workload), SUS questionnaire (presence) and SSQ (simulator sickness)
- Qualitative data from post test interviews and logs

Results

<table>
<thead>
<tr>
<th>Participants</th>
<th>Non - expert users</th>
<th>Expert users</th>
</tr>
</thead>
<tbody>
<tr>
<td>PhD students</td>
<td>3.54/6</td>
<td>3.85/6</td>
</tr>
<tr>
<td>engineers</td>
<td>(SD = 0.14)</td>
<td>(SD = 0.14)</td>
</tr>
<tr>
<td>8 males</td>
<td>26.6/3</td>
<td>32.1/3</td>
</tr>
<tr>
<td>8 females</td>
<td>(SD = 7.54)</td>
<td>(SD = 0.74)</td>
</tr>
<tr>
<td>mean age :</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presence</td>
<td>4.47/7</td>
<td>5.10/7</td>
</tr>
<tr>
<td>(SD = 1.14)</td>
<td>(SD = 0.96)</td>
<td></td>
</tr>
</tbody>
</table>
| Simulator sickness | 3.94/33 | 3.15/33 (
|                  | (SD = 3.39)      | (SD = 2.97) |
| Time         | 13.44 min           | 14.71 min   |
|              | (SD = 3.65)        | (SD = 19.25)|
|              |                    |

Discussion and Conclusion

- Acceptability the VR simulator was demonstrated for all participants
- No statistical significant differences regarding age, gender and expertise
- Most participants stressed its pedagogical interest, fun and realism
- VR simulator was validated for initial and vocational training

Limits
- Small sample size
- Experts from only one specialty and department

Following steps
- Measure transfer of skills to the OR
- Development of Non-Technical Skills (NTS) scenarios
- Intercultural studies

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